www.rsgb.org

The Radio Society of Great Britain Members' Magazine

RadCom

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INSIDE

WATERS & STANTON

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Christmas Opening Times

Hockley: Closed Sun 25 Dec - Tue 27 Dec
Closed Sun 1Jan - Mon 2 Jan
Lowe: Closed Sat 24 Dec - Mon 2 Jan
Jaycee: Closed Sat 24 Dec - Mon 26 Dec
Closed Sat 31 Dec - Mon 2 Jan
Please check www.wsplc.com

NEW YAESU

FT-9000D NOW AVAILABLE

50% DISCOUNT on any Heil Mic when you purchase your FT-9000 from W&S - the UK's largets Yaesu Dealer, Plus **FREE** entry into our £2000 **Yaesu Competition** with 500:1 win chance.

Watson W-25SM 25 Amps

The switch-mode power supply that does not have the problems of some competitive modes.

RSGB says "Best power supply tested" **£79.95**

PRICEMATCH!

We will match or beat any UK advertised price on UK sourced and UK guaranteed stock. Items must be in stock with the competitor and brand new - not B-Stock or old stock clearance.

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

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Hands Free!

Opening Offer Price

Ready-made leads for:
Yaesu 2800, 7800 8800, 900,817,857 & 897.
Kenwood 271E, D700E, & G707.
Icom 220H, E208, 2100, 2725, & 706.

Ready to Go! Wired for your transceiver **£39.95** Code WM-S

PTT Box

Goose-neck mic mounts under visor bolts and PTT mounts on gear-change. All hardware included. FREE lead for your radio includes

NEW **The NEW Waters & Stanton UK Radio Communications Equipment Guide 2006**

- Free Carriage Vouchers
- 400 Pages • Full Colour
- Articles & Reviews
- Detailed Spec on every piece of Ham Gear
- Over 4000 Products

AVAILABLE NOW !!!

£3.95 + £1.75P&P

A Waters & Stanton CHRISTMAS PRESENT

Buy any new HF Transceiver before Jan 2006 and get the following package:

*W-25SM 25 Amp PSU	£79.95
*AV-201 SWR Meter	£49.95
*WPL-70 Patch Lead	£6.95
*HP-200 Padded Headphones	£22.95
*Transmitting Logbook (A4)	£4.99
*World Prefix Map (A3)	£2.99
Total:	£167.78

All For Just £99!!

Icom HF Transceivers

ICOM IC-756 PRO MkIII

Top of its range HF transceiver. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit. **£2099 C**

IC-7800 £6400 C
Flagship HF 200W transceiver. 200W max. The ultimate receiver - the ultimate design! AC psu built in.

IC-7800-PACK £6995 C
The superb transceiver as above plus 17" flat screen, keyboard and SM-20 base microphone.

IC-7400 £1279 C
HF/VHF 160m - 2m transceiver 5 - 100W. SSB CW FM AM. 12V DC. Nice big display. Lovely price.

IC-706 MkIIGDSP £769 C
It's unbeatable. 160m - 70cm (up to 100W HF) yet so small with detachable head. The ultimate mobile.

IC-718 £449 C
This is a budget class radio HF 16 - 10m at a price that belies its performance. Beautiful display.

IC-703 *Free IC-703 Logbook* £539 C
Take an IC-706, reduce power to 10W max and get rid of VHF. 160 - 6m of pure QRP joy!!

NEW IC-7000 £Phone!
The new IC-7000 is **NOT a replacement** for the IC-706 but is a very much up-market design. It is in a box about the same size as the IC-706 but very much like an IC-756 in concept. This will be **THE mobile rig** that others will have to aspire to!!.

Kenwood HF Transceivers

KENWOOD TS-2000

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. *Low Price* **£1295 C**

TS-2000 The station in a box. 160m - 70cm with every feature imaginable inc. DX cluster. Kenwood fans dream rig.

TS-2000X £1789 C
Take the TS-2000 and add a superb 23cm module. The best 23cm we know of plus all other bands!

TS-B2000 *Low Price* £995 C
Designed for the 21st century. You get HF - 70cm with PC software for direct PC control. It works great.

TS-570DG *Low Price* £799 C
The best budget radio at the price. Superb 100W from 160m to 10m. As used by Peter Waters, G3OJV

TS-50S £595 C
A great rugged mobile for 160m to 10m with up to 100W output. Also a great price.

TS-480SAT *Special* £699 C
HF 160m - 6m with remote front panel. Large enough for base use, small enough for mobile. Big display

TS-480HX *Special* £799 C
Take the TS-480SAT, remove the auto ATU and offer a beefy 200W output. That's a really potent package!

Yaesu HF Transceivers

YAESU FT-857D

Our best selling Yaesu HF Rig. Since the price came down from £849 to £579 we can't get enough of them! 160-70cm mobile with up to 100W output. Lovely tuning control from remote head unit . **£579 C**

FT-1000 MKV £2099 C
200W HF Transceiver, with EDSP, Collins filter, auto ATU, 220V AC PSU - One of the finest rigs available.

FT-1000 FIELD £1699 C
The HF choice for DXers. With this rigs reputation on DXpeditions what more persuasian do you need?

FTV-1000 £619 C
6m 200W module for the FT-1000 range. Probably the ultimate for 6m DXing.

FT-897D £649 C
160m - 70cm self-contained portable. 100W and up to 20W from optional internal batts.

FT-847 £999 C
Complete station in a box! 160m - 70cm - up to 100W (50W 2m/70cm). Great for satellite work.

FT-840 £399 C
Is there any other radio that comes close to this price? One of our all-time best sellers. 100W 160m - 10m

FT-817ND £Phone C
The ultimate QRP self-contained radio. Up to 5W out-put 160m - 70cm. New low price. UK warranty.

FT-817DSP *Low Price* £559 C

Warning - as a regular advertiser you can be sure all our stock is genuine UK warranted. Check serial numbers!!

Carriage Charges: A=£3, B=£6, C=£10

Natale Allegro Veselý Vánoce Frohe Weihnachten

Merry Christmas

God Jul Christmas Alegre 'n arab nadolig Vrolijke Kerstmis

to all our customers

Joyeux Noël メリークリスマス Masaya Pasko Feliz Navidad

Freephone Orderline 08000 73 73 88

Icom
VHF/UHF Mobile/Base

ICOM IC-E208

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
£215 C

IC-910H £1087 C
2m / 70cm 100W Base station all - modes with option for 23cm module (**UX-910 £359**)

IC-910HX £1235 C
As above but with 23cm module ready fitted and a big saving as well.

IC-2200H £179 C
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E £269 C
Icom's dual band 2m / 70cm radio. Very easy to operate and install and a lovely detachable head.

Kenwood
VHF/UHF Mobile/Base

KENWOOD TMD-700E

2m/70cm dual band mobile transceiver with APRS. Does not need extra high cost boards to function. Only extra if required is a compatible GPS receiver. **£418 C**

TM-G707E £265 C
Dual Band 2m & 70cm with detachable front

TM-V7E £359 C
Dual Band 2m & 70cm with 50/35W output

TM-271E £187 C
Dual Band 2m FM 60W mobile transceiver

Yaesu
VHF/UHF Mobile/Base

YAESU FT-7800E

*2m/70cms Dual Band Mobile
*High power 50W 2m /40W 70cms
*Wide receive inc. civil & military air-band *CTCSS & DCS with direct keypad mic.
*Detachable front panel *1000 memories plus five one-touch
£229 C

FT-2800M £149 C
*2m FM Mobile transceiver * High power 65W * Capable of VHF wideband receiver

FT-8800E £267 C
*2m/70cmDualband FM Mobile transceiver * 50W 2m, 35W 70cm * Wideband receiver

FT-8900R £339 C
*2m, 70cm, 6m & 10m Quadband FM Mobile transceiver * Independent dial for each band

Yaesu
ADMS Software

Programming Software For Your Radio
Programme Memories and all your radio's functions from your PC. Includes Windows software and serial lead with adaptor for your Radio.
ADMS-1F for VX-110/1 / **ADMS-1G** for VX-7
ADMS-1H for VX-2E / **ADMS-1J** for FT-60E
ADMS-2H for FT-8900 / **ADMS-2I** for FT-8800 / **ADMS-2J** for FT-2800 / **ADMS-2K** for FT-7800 / **ADMS-3** Programming Kit for VR-500, all **£39.95** with FREE PC Radio Data Lead.
ADMS-4A for FT-817 and **ADMS-4B** for FT-857/8 both **£29.95**, both these items require a seperate CT-62 lead at **£29.95**

Icom
VHF/UHF Handhelds

NEW **IC-V82** £159 B
2m FM Digital Handheld 7W

NEW **IC-U82** £159 B
70cm FM Digital Handheld 5W

IC-E90 *Limited Offer* £199 C
6m / 2m / 70cm handheld transceiver

IC-T3H £129 C
2m FM handheld 5.5W c/w BC-01 & BC-146

IC-E7 *DUE IN 2006*
New 2m / 70cm handy wideband RX

Kenwood
VHF/UHF Handhelds

KENWOOD TH-F7E

• 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. **£237 B**

TH-D7E £299 C
2m/70cm dualband FM handheld transceiver with data communications

TH-G71E £179 C
2m/70cm dualband FM handheld transceiver

TH-K2E £139 C
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K2ET £145 C
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K4E £139 C
70cm FM 5W portable transceiver c/w Ni-MH battery/charger

Yaesu
VHF/UHF Handhelds

YAESU VX-7R
LIMITED SPECIAL OFFER

Totally waterproof, wide frequency coverage 500kHz-900MHz AM/FM. 132x64 dot matrix display providing easy-to-read frequencies and information plus pictorial graphics. **£209 C**

NEW **VX-6E** £189 C
2m/70cm wideband receive 5W

FT-60E £169 C
2m/70cm wideband receive handheld 5W

VX-2E £119 C
2m/70cms miniature handheld

VX-110 £94 C
2m handheld with 8-key pad

Alinco
VHF/UHF Handhelds

DJ-V5E £159 C
2m/70cm FM 5W dualband handheld transceiver

DJ-193E £91 C
2m FM transceiver no keypad, Ni-Cds & charger

DJ-195E £99 C
2m FM transceiver with keypad Ni-Cds & charger

MFJ
Loop Antenna ATU's

MFJ-935B / 936B Loop Tuner

This is the most amazing antenna we have seen in years. For optimum results take a wire around 1/5th wave long, bend into square loop (14ft on 20m = 3.5ft square) and attach to MFJ-935. Result: Ultra low indoor noise and VK, ZL & W all on SSB! That's what we achieved in one day's operation! 20m loop works on 15m as well. Now in Stock! Great for QRP and portable as well.

MFJ-935B is portable version with smaller meter internal coil. £179.95
MFJ-936B has larger meter and is ideal for base use. £229.95.
You use your own wire to make loop (approx 1/5 wave total length for lowest band) or purchase:
MFJ-57B with cross arm and wire for 20/17/15m - approx 2ft per side £39.95.
MFJ-58B has addition of wire for 40/30m £54.95

Ameritron
HF Linear Amplifiers

NEW LOWER PRICES!

AL-1200XCE £2295.95 C
HF linear amp 10-160m 1.5kW

AL-1500XCE £2595.95 C
HF linear amp 10-160m 1.5kW

AL-800HXCE £2495.95 C
HF linear amp 10-160m 1.5kW

AL-82XCE £2295.95 C
HF linear amp 10-160m 1.5kW

AL-80BXCE £1395.95 C
HF linear amp 10-160m 1.5kW

AL-811HXCE £849.95 C
HF linear amp 10-160m 500W (3x811A)

ALS-500MXCE £819.95 C
HF linear amp 10-160m 500W solid state

ALS-600X £1299.95 C
HF linear amp 10-160m 600W (export only)

SGC
HF Linear Amplifiers

SG-500 £1399.95 C
"Power Cube" 1.6-30MHz 500W solid state

Yaesu
HF Linear Amplifiers

QUADRA (VL-1000) £3795 C
HF + 6m linear amp. 1kW comes with PSU

Tokyo Hy-Power
HF Linear Amplifiers

HL-1KFX £1399.95 C
HF linear amp. 1.8-29.7MHz 500W PEP max, solid state

HL-2KFX £2695.95 C
HF +6m linear amp 1.8-29.7MHz + 50MHz 1kW PEP max, solid state

HL-100BDX £429.95 C
HF+ 6m linear amp 3.5-29.7 & 50MHz 1-10W in 100W PEP solid state

NEW STOCK & OFFERS

A Waters & Stanton CHRISTMAS PRESENT

Buy any new VHF/UHF Handheld before Jan 2006 and get:

*WAP-700 Earpiece & Mic	£19.95
*WSM-270 Mobile Whip	£19.95
*WSC-3 Belt Clip Case	£12.95
*CN3 BNC/SMA Adaptor	£5.95
*Mobile LogBook (A5)	£4.99
Total:	£63.79

All For Just £35!!

YAESU VX-120 & VX-170 NEW

< VX-120
A 2m 5W handheld with an 8-key pad, Ni-MH batt & charger. The VX-120 features Enhanced Paging, Code Squelch (EPCS), 200 Memories & Security Password. **£99.95 B**

VX-170 >
A 2m 5W handheld with a 16-key pad, Ni-MH batt & charger. The VX-120 features Enhanced Paging, Code Squelch (EPCS), 200 Memories & Security Password. **£109.95 B**

Watson
Mobile Antenna's

ANTENNAS

W-2LE	1/4 wave 2m 0.48m 200W	£9.95 B
W-285	5/8th 2m 1.33m long 200W	£14.95 B
W-77LS	2m/70cm 0.42m 50W	£14.95 B
W-770HB	2m/70cm 1.1m 200W	£24.95 B
W-7900	2m/70cm 2m/70cm 1.58m	£32.95 B
WSM-270	Dual band mini magnetic	£19.95 B

BASES

WM-08B	8cm diam magnetic	£9.95 A
WM-14B	14cm diam magnetic	£12.95 A
W-3HM	Hatch mount	£14.95 A
W-ECH	Cable kit	£12.95 B

NOTE: All antennas have PL-259 ends. Mag mounts have cable attached. Hatch mount needs ECH cable.

Carriage Charges: A=£3, B=£6, C=£10

WATERS & STANTON

Freephone Orderline
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Enquiries 01702 206835
www.wsplc.com

UK'S LOWEST PRICES!

NEW STOCK & OFFERS

MANSON SDC-2010

NEW

£9.95 A

* Cigar Plug-in DC adaptor
* 1.5 - 12V DC 1.5 Amps
* Stabalised and protected.
* 7 - way DC adaptor set.
* Matches most Yaesu / Alinco sockets.
* Works from 12 V or 24 V vehicle systems.

POCKET MORSE READER

MFJ-461
Reads CW
Just hold near receiver speaker

£69.95 B

That's right - just hold this self-contained decoder near your speaker and see the text scroll across the screen. Absolutely amazing

SG-2020ADSP QRP 20W HF Radio

160m - 10m
0.1 - 20W
Full DSP
Diecast Chassis

Perfect for QRP. SSB / CW and DSP processing. Passband down to 100Hz. Built-in SWR meter and electronic keyer. Max Tx drain 4A. Size 15 x 6.5 x 18cm. 680g.

SPECIAL OFFER
£499.95 B

Diamond HF Dipoles

NEW

Compact 1 kW Wire Dipoles

W-735 80/40m 26m long (85.5ft) balun fed wire dipole. Ideal for small gardens. Just drop ends down for fitting into 50ft long plots. **£69.95 B**

W-8010 80/40/20/15/10m 19.8m long (65ft) balun fed wire dipole. Easily fits 50ft plot with ends dropped. **£89.95 B**

High quality Diamond Japanese antennas

Antenna Accessories

Antenna Traps (pairs)

TR-200	200W 14MHz (20m)	£44.95 B
TR-200-10	200W 10MHz (30m)	£47.95 B
TR-200-7	200W 7MHz (40m)	£49.95 B
TR-200-3.6	200W 3.6MHz (80m)	£53.95 B
TR-1000-14	1kW 14MHz (20m)	£59.95 B
TR-1000-10	1kW 10MHz (30m)	£61.95 B
TR-1000-7	1kW 7MHz (40m)	£64.95 B
TR-1000-3.6	1kW 3.6MHz (80m)	£73.95 B

German Made High Quality Baluns

HB-1-200	1:1 3.5 - 30MHz 200W	£25.95 B
HB-4-200	4:1 3.5-30MHz 200W	£25.95 B
HB-6-200	6:1 3.5 - 30MHz 200W	£25.95 B
HB-1-1	1:1 3.5 - 30MHz 1kW	£34.95 B
HB-4-1	4:1 3.5 - 30MHz 1kW	£41.95 B
HB-6-1	6:1 3.5 - 30MHz 1kW	£41.95 B

Remote 4:1 1.5kW Balun

REM-BAL For coax to ladder line match £45.95 B

SGC External Auto ATU's

SGC SG-231

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£349.95 C

SG-239 £189.95 C
Mini auto ATU 1.8 - 30MHz 1.5 - 200W PEP primarily for long wires - non waterproof. 12V DC

SG-237 £299.95 C
1.8 - 60MHz 100W PEP. Great for mounting outdoors and feeding long wire. Waterproof. 12V DC

SG-230 £339.95 C
1.8 - 30MHz 200W PEP. The original design that handles end fed or coax unbalanced. Waterproof. 12V

SG-235 £749.95 C
3.5 - 54MHz. A hunky 120W PEP tuner that handles long wires. Great outdoor design. Waterproof.

MAC-200 £259.95 C
1.8 - 60MHz 200W PEP. Wire, coax and balanced feeder. Features auto antenna switching.

SG-211 £189.95 C
1.8 - 60MHz works off internal dry cells. Zero drain wait state. 60W PEP. Ideal for portable (Min 1W).

Icom External Auto ATU's

AH-3 £479.95 C
1.8 - 28MHz. A hunky 120W PEP tuner that handles whips or wire longer than 2.5m. Waterproof.

Alinco External Auto ATU's

EDX-2 £289.95 C
1.8 - 30MHz 150W long wire tuner designed for use with DX-70 transceiver. Waterproof.

Diamond VHF / UHF Ants.

NEW

A144S5	5 el 2m 9.1dbi 0.95m L.	£29.95 C
A144S10	10 el 2m 11.6dbi 2.13m L	£59.95 C
A430S10	10 el 70cm 13.1dbi 1.19mL	£31.95 C
A430S15	15 el 70cm 14.8dbi 2.25m L.	£39.95 C
SB144	Boom for dual 2m Yagis	£19.95 B
SB430	Boom for dual 70cm Yagis	£15.95 B
SS144	Stack transformer 2-way 2m	£69.95 A
SS430	Stack transformer 2-way 70cm	£59.95 A
KB144	Mast stand-off for vert. polarise	£15.95 A
KB430	Mast stand-off for vert. polarise	£14.95 A

High quality Diamond Japanese antennas

SGC Internal Auto ATU's

SG-237PCB £279.95 C
1.8 - 60MHz 100W PEP. Same as SG-237 but without housing for building into your own housing.

Yaesu Internal Auto ATU's

FC-20 £249.95 C
1.8 - 60MHz 100W matched for FT-100/Ft-847. Desk top unit to match transceivers. Coax systems only.

FC-30 £249.95 C
1.8 - 60MHz 100W. Designed for use with FT-857/FT897. Coaxial input / output.

FC-40 £239.00 C
1.8 - 60MHz 100W. New waterproof ATU designed for use with FT-897 / FT-857 and mobile operation.

Icom Internal Auto ATU's

AT-180 £349.95 C
1.8 - 54 MHZ ATU designed for IC-708. Plugs directly into transceiver for seamless operation. Coax only.

Kenwood Internal Auto ATU's

AT-50 £319.95 C
1.8 - 30 MHZ 100W ATU specifically designed for use with TS-50 transceiver. Coaxial only.

Cushcraft HF Antennas

MA5V £239.95 C
Vertical 5-band 20m - 10m. No separate radials needed. 250W. Self-supporting. 4.48m tall.

A3-S £469.95 D
The classic 20 15 10m 3-el beam. 2kW 8dB gain. 8.45 el. Turn radius 4.72m. F/B ratio 25dB.

A3-WS £379.95 D
Dual Band 3 el beam for 17m & 12m. 2kW. El length 7.66m. Turn radius 4.4m. Gain 8dB. F/B ratio 25dB.

A4-S £569.95 D
Tri-band 4 element Yagi. for 20m - 10m. DXers delight. 2kW . 8.9dB gain F/B 25dB. Turn radius 5.49m

R-8 £469.95 C
8-band vertical 40m - 6m. No separate radials needed. 1.5kW. Height 8.7m

R-6000 £329.95 C
6-band vertical 20m - 6m. No separate radials needed. 1.5kW. Height 5.8m. Great small garden ant.

MA5B
£369.95 C

5-band 2 El mini beam. 20m - 10m 2kW. Elements 5.2m Turn radius 2.7m. (Dipole on 17/12m) 5dB gain

Diamond HF Antennas

DIAMOND CP6 VERTICAL

Covers five popular HF bands and the 6m band. Low angle radiation makes it ideal for DX work. Outperforms dipoles for long distance contacts and compares favourably with beams located 10m+ above ground.

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

£239.95 C

Radio Works HF Antennas

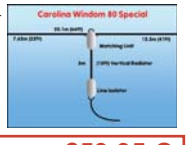
CW-160 £129.95 C
8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 265ft long.

CWS-160 £119.95 C
Compact 8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CW-80 £89.95 C
7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CWS-80 £109.95 C

Compact 7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 66ft long.



G5RV Plus £59.95 C

Rugged 2kW balun matched G5RV with 102ft element and 31ft ladder line. Requires ATU. Made in USA

Hustler Base Antennas

6-BTV £229.95 C
80 - 6m 6-band vertical. 7.3m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

5-BTV £199.95 C
80 - 10m 5-band vert. 7.64m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

4-BTV £169.95 C
40 - 10m 4-band vert. 6.52m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

Butternut Antennas

HF2V £229.95 C
80 / 40m high performance vertical. 1kW PEP 9.75m tall. Self supporting for ground mount use.

HF6V £299.95 C
6 band vertical 80-40-30-20-15-10m. 2kW. 7.9m tall. Use own radials or ground mount.

HF9V £349.95 C
9-band 80 40 30 20 17 15 12 10 6m vertical 1kW 7.9m tall. Use radials or ground mount

Buddipole Products

HF Portable at its Best

W3-BP £179.95 B
40m - 2m adjustable dipole. 250W and max length of 4.65m. Packs down to 65cm approx.

W3-MBP £189.95 B
Sames as W3-BP but packs even smaller.

W3-BS £109.95 B
40m - 2m vertical is half a Buddipole. Ideal for QRP and rucksack - as used by Peter Waters G3OJV.

Peter Waters says: *I think these products are great. Superbly engineered and very efficient.* Options include adaptor for dipole to decorators pole £6.95, Field tripod £89.95, 2.45m telescopic mast £49.95, mini tripod for Buddistick.

Super Antennas

MP1-SA £139.95 B
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P&P on RSGB orders: £1.75 for 1 item, £3.30 for 2 or more items. Overseas rates on request.

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Cover photo: Keith Syvinska (leosynapse.blogspot.com)

RSGB matters

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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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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Website: www.rsgb.org

WebPlus: Members-only web site **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.

RESULTS OF MORI POLL INTO FUTURE OF AMATEUR RADIO

The majority of radio amateurs want to keep the existing amateur radio licensing regime or change to a longer licence renewal period rather than switch to a licence for life, according to an Ofcom commissioned MORI poll into the future of amateur radio in the UK. The survey of 1,572 amateurs also revealed that two-thirds of amateur radio licensees believe that the current licensing arrangement is "about right".

Readers should note that this poll does not represent the final results of Ofcom's consultation into the future of amateur radio. The regulator is still processing the responses it received to its consultation document and is expected to announce those results before Christmas. The MORI poll is just one small part of the overall consultation process.

Ofcom is keen to issue amateur radio licences for life. But 52% of respondents to the MORI survey said they prefer either the existing arrangement or an extended renewal period. Among members of the RSGB, the lifetime licence is even less popular, with around two-thirds favouring the current arrangement or a longer renewal period. Only a third preferred a life-time licence. Interestingly, support for the lifetime licence was less among frequent radio users than among those who use their radios irregularly.

Of those who wanted a longer renewal period, 60% preferred a five year renewal period, 23% a three year renewal period and only 10% a ten year or more renewal period. The survey also showed that only a tiny minority (1%) wanted to abolish the licensing arrangement altogether, radio amateurs generally believing that the licensing system was vital in maintaining standards of on-air operation. Less than 1% wanted to replace the current Foundation, Intermediate and Advanced licences with something else.

Radio amateurs were generally also not keen on Ofcom's plans for web-based electronic licences, with only two in five giving their support to this idea in spite of Ofcom offering to provide a licence postal service for those who don't have access to the Internet. The full results of the MORI survey can be downloaded from the Ofcom website – www.ofcom.org.uk/radiocomms/ifi/licensing/classes/amateur/morireport/

HAVE YOU EVER HAD A RADIO ROMANCE?

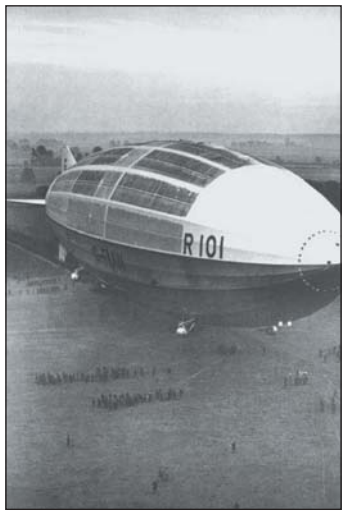
RadCom is keen to hear from hams who have married or fallen in love after an on-the-air contact for an upcoming article in the magazine. If you have enjoyed a radio romance, please send *RadCom* the following information: 1 Details of how you met on the air; 2 Details of your first encounter in the flesh; 3 How long you have been together; 4 Where you live; 5 Pictures of each partner.

Please also provide the name, age, place of birth and profession of each partner. The information can either be e-mailed to *RadCom* at radioromance@rsgb.org.uk or posted to The Editor, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts, EN6 3JE.

RADIO CLUB MARKS ANNIVERSARY OF AIRSHIP TRAGEDY

The Bedford & District Amateur Radio Club recently operated a special event station to commemorate the 75th anniversary of the ill-fated maiden voyage of the airship R101. The R101 was the largest airship ever built and was scheduled to travel from Cardington to Karachi in Pakistan (then part of British India). At 6.24pm on Saturday 4 October 1930, the R101 departed Cardington. However, the voyage ended in disaster after 7.5 hours when the airship came down at Allonne, not far from Paris. Only six people out of the 54 passengers and crew survived.

Bedford & District club secretary Andy Sanderson, M1TLK, said: "The ship was built at the airship works at Cardington on the outskirts of Bedford. We thought a special event station would be a good way to commemorate the 75th anniversary and remember all those who lost their lives in this tragic crash".



The club made contact with 120 stations during the special event using two transceivers – the IC-756PROIII and the IC-7400 – supplied by radio equipment maker Icom. The furthest contact was with Columbia. Andy added: "We also managed to speak to a veteran ham of 94 years old who witnessed the flight in 1930 and many other people who were either stationed at RAF Cardington or passed through on RAF selection boards".

BRIGADES ON THE AIR

Worksop Amateur Radio Society is planning a new 'On the Air' initiative. Following on from Museums on the Air, Islands on the Air and Jamboree on the Air, the club wants to launch Brigades on the Air under which radio amateurs would set up special event stations at local fire stations. The idea was first put forward by ex-fireman Ken and has gained the support of the Worksop club. The Nottinghamshire Fire Brigade has also agreed in principle to have an annual event staged at its headquarters. Ken said: "We have checked to make sure that our radio equipment does not cause any interference to their equipment."

The club is planning special Brigades on the Air QSL cards and also a certificate for those who contact the most number of stations. All profits from the initiative will go to the Fire Service Brigade Benevolent Fund.

The Worksop Amateur Radio Society is keen to hear from any other clubs interested in participating in the Brigades on the Air initiative. Contact Clive, M0HHF, at email address clivem0hhf@aol.com

HAVE YOU A QUERY OR A TECHNICAL PROBLEM?

Or are you trying to find a circuit for that old piece of kit? Depending on the nature of your question, there are four main routes to an answer:

- if you need an individual response to a specific technical query, write to the Chairman of the RSGB Technical Committee, Tony Plant, G3NXC (QTHR or technical@rsgb.org.uk);
- if you have a more general technical question, and think the answer would also be of interest to other radio amateurs, write to G3SEK's 'In

Practice' column (e-mail and postal addresses are given every month);

- if you need obsolete manuals, obscure spare parts etc, you can ask all *RadCom* readers through 'Helplines' (write or e-mail to *RadCom* at the addresses on p5);
- if you have an RF interference problem, you can use the EMC Technical Help scheme; send your question to your local representative, or to a contact specialising in your problem area; addresses can be found on pp187/188 of the current *RSGB Yearbook*.

2E1GUA RECEIVES CARS CONTEST AWARD

The Chelmsford Amateur Radio Society recently awarded the CARS Contest Trophy to Jim Beatwell, 2E1GUA. Jim is an active contester with a particular interest in VHF/UHF. He is keen to encourage more Foundation and Intermediate holders to take part in VHF/UHF contests. With this in mind, he recently donated two trophies to the RSGB to be awarded to the Foundation and Intermediate licensees who achieve the highest VHF/UHF contest scores over the year.

CARS chair Christopher Chapman, G0IPU, presents Jim with the trophy

OLIVIA UNVEILED BY HAVERING RADIO CLUB

Reading *RadCom* is not the only way of finding out about the latest developments in amateur radio. Many clubs also provide useful information on new amateur radio technology and techniques. A case in point is the Havering Radio Club, which has recently posted an interesting article by Dave, 2E0EBV, on the Olivia MSFK data mode on its website. See www.havering radioclub.co.uk

NEW QSL SUB MANAGERS

The RSGB's QSL supervisor has informed *RadCom* of the following changes to the society's QSL department. Mr J Macrae, G4DXI, has stepped down as QSL sub manager for the G0HAA-HZZ series. He has been replaced by Brian Shearer, MM1HMV, of 113 Auchamore Road, Dunoon, Argyll, PA23 7JJ.

It is with sadness that we report that Mr EJ Otty, G4XRL, the QSL sub manager for G0SAA-G0SZZ, is now a silent key. His role has now been taken over by Davina Williams, M0LXT, of 20 Neale Close, Wollaston, Northamptonshire, NN29 7UT.

DON'T FORGET TO SEND OFF YOUR ENVELOPES

Dave Helliwell, QSL sub manager for G8+3, is keen for amateurs to send him envelopes so that he can post their QSL cards to them. "I have 1,832 cards for 480 of the G8s where I have no envelopes to send the cards out," he says. "While storage is not an issue for me I would like my fellow amateurs to actually receive the cards that have been sent to them."

If you are interested in receiving your QSL cards, email your envelopes to 1 Beechfield Avenue, Barton, Torquay, TQ2 8HU. Hams can also check the following web page – www.g6fsp.com/qsl – for details of what cards and envelopes Dave is holding for them. Dave can also be contacted by email – dave@g6fsp.com.

Volunteer vacancy

Chairman, HF Convention Committee

The HF Convention Committee is responsible for organising and running the RSGB's flagship annual event, the HF Convention. This internationally renowned event attracts visitors not just from the UK but from around the world, and has the reputation of being one of the premier events in the amateur radio calendar.

Due to the retirement of the current chairman, the Society is seeking to appoint a new chairman as soon as possible. If you are interested, you need to be a well motivated hands on team leader and organiser. You must be prepared to coordinate the wide number of activities that make up the HFC programme. You will be prepared to lead from the front

If you consider yourself to have all that is required and are interested, please write to Peter Kirby, G0TWW, General Manager, enclosing a CV of both your employment and business experience and your amateur radio interests/activities. The closing date for applications is 31 December 2005.

Supporters of the Radio Communications Foundation

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

Big Hitters

Mr A M Byrne	G0WME

Mr D Edwards	2W0YDK
C M Campos	EA8ALZ
Mr JM Purfield	EI2CI
Mr K E Dixon	EI9AB
Mrs E P Tyler	G0AEC
Mr S R Tricker	G0AZP
Mr M G Kendall	G0EMK
Mr J A Harrington	G0ERH
Mr L Surgey	G0GMW
Mr DJH Chalmers	G0IYE
Mr R C Pardoe	G0MHZ
Mr G W Langford	G0MKU
Rev F G Bligh	G0MTA
Mr G A Nattrass	G0OGD
Mr M J Payne	G0OGU
Mr D A Barnes	G0RIF
Mr A A Robinson	G0RLW
Mr P Jarvis	G0RVY
Mr B Hillman	G0UXO
Mr L W Browne	G0VCD
Mr N P Reilly	G0VOK
Mr M J Field	G0VXF
Mr D A Winkley	G1DYC
Mr J W Shoebridge	G1FMD
Mr F Mallows	G1GYJ
Mr A J Gateley	G1NAN
Mr T Jones	G1UMV
Mr CAG Hoy	G1YZN
Mr D Smith	G1ZJQ
Mr GW Alderman	G3BNE
Mr M H Jones	G3GRU
Mr KSP McFarlane	G3ICG
Mr J F Lucas	G3ISU
Mr T K Wright	G3KVE
Mr S B Smythe	G3ODH
Mr D E Saunders	G3OWE
Mr R N Francis	G3RWU
Mr P R Cragg	G3UGK
Mr A Wang	G3VAA
Mr A G Coker	G3WHM
Mr W R Prince	G3XEK
Mr S H Bassford	G3YZB
Mr MC Baker	G3ZBP
Mr JD Garner	G3ZJG
Mr C Zeal	G4BGM
Mr D J Lockwood	G4CLI
Mr B A Roberts	G4DBQ
Mr BH Slatter	G4DF
Mr GMM Head	G4EBY
Mr I A Welburn	G4EMA
Mr T J Aldridge	G4GJR
Mr S P Richardson	G4JCC
Mr C J Newman	G4JCJ
Mr D A Holmes	G4KIZ
Professor J.M.Nelson	G4KLA
Mr A Daulman	G4KQL
Mr R A Pellatt	G4LJI
Mr P G Dolling	G4LQZ
Mr P D Gaskell	G4MWO
Mr JMR Greatorex	G4PIM
Mr A G Harris	G4SJI
Mr T J Stanley	G4TXK
Mr R H Alderson	G4ZQC
Mr W O Wigg	G5OW
Mr B Jenkinson	G7BBJ
Mr A J Florence	G7CDK
Mr B R Edwards	G7FVF
Mr N J Lambert	G7HCO
Mr A Champion	G7LBH
Mr D Remnant	G7LXP
Mr A J Sadler	G7MUY
Mr G Rogers	G8ABB
Mr A Hibberd	G8AQN
Mr W D Curtis	G8BGR
Mr J Renaut	G8DJL
Mr E B March	G8EOJ
Mr D J Keston	G8FMC
Mr AC Stables	G8FMH
Mr R A Parker	G8HNM
Mr S C Parham	G8IEA
Mr J Noden	G8IOK
Mr G W Allen	G8LZG
Mr D Dale	G8MOG
Mr C B Ward	G8SMA
Mr M Kremer	G8VLN
Mr P H Stoner	G8XOS
Mr A Crowther	GD0MWL
Mr M Deehan	GI0HDO
Mr JTL Mc Clintock	GI4MAJ
Miss J Dunne	GI4MJD
Mr V M Fails	GI4WWF
Mr T H Currie	GM0FRH
Mr D Smith	GM0KCN
Mr W Frame	GM3ZWG
Mr D Brown	GM6JUA
Mr G R Kelly	GM8MST
Mr BF le Lievre	GU4LJC
Mr T Higginson	GW3AHN
Mr J Brace	GW3JBZ
Mr J D Davies	GW3JVW
Mr D Harris	GW3NDR
Mr H R Jones	GW4GFS
Mr JD Shurmer	GW7BZR
Mr J H Baines	GW7LXI
Mr P Lockley	M0DYH
Mr M Josi	M0HSX
Mr L V Worton	M0LNX
Mr K R Austen	M1AZO
Mr K Broxup	M1BVQ
Mr M J Purcell	M1DAP
Mr H W Rooms	M1ETU
Mr A W Evans	M1VIP
Mr R Parkhouse	M3ECS
Mr N R McKee	MI1MCK
Mr E D Cameron	MM0BIX
Mr LEB Tombe	MM3AXA
Mr W L Sheppard	MW0LES
Mr G Bowden	RS176339
Mr P J Geoghegan	RS184650
Mr R Nottage	RS185003
Mr B Kehoe	RS193643
Mr R Luscombe	RS195516
Mr A B Walker	RS195577
Mr P C Wagstaff	RS195636
Mr I L Myers	RS195648
Mr R Singleton	RS25288
Mr J R Lewis	RS36870
Mr AJW Rozelaar	RS4590
Mr JMY Yellowlees	RS87120
Mr P Fitzpatrick	RS91982
Mr RIH Scotland	RS93531
Mr ACF Smith	VK6CPV
Mr LC Isaacson	ZS1CI

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.

Congratulations

The following are RSGB members who have recently passed their Intermediate Exam.

October Intermediate Examination

Steven Webber, M3WRS
Mark Bower, M3HXT
Mel McGoldrick, M3FZZ
Lyndon Reynolds, M3LRZ
Alan Jenner, M3PHY
Neil Dearing, M3RYW
Thomas Gorton, M3KLZ
Michael Bryan, M3MZZ
William Donnelly, M3IHV
William Walker, M3KEO

September Intermediate Examination

Nicholas Simon, M3LID
Ronald Vials, MW3IWZ
Richard Vaughan, M3GYD
Keith Hyde, M3ISK
James Clarke, M3UJC
Roger Smith, M3IOS
Warren Payne, M3OWP
Barry Grice, M3JBO
Thomas Freeman, M3BHW
Tony Humphries, M3BIC
Alan Highfield, M3HHN
Kenneth Sparrow, M3CXG
Raymond Williams, M3RAQ
Mohammad Farooqui, M3MMQ
Timothy Jones, M3IZT
John Edington, M3MJK

Student-built space craft finally launches

SSETI Express, the first space craft designed and built by European students, including radio amateurs, finally blasted off on 27 October after a string of delayed launches. The European Space Agency-sponsored space craft was launched into space on a Russian Cosmos 3M rocket that took off from Plesetsk in northern Russia.

Even through SSETI Express is only 52kg, it has been described as a space craft, rather than a satellite, because it will itself deploy three tiny 1kg pico-satellites for carrying out space experiments. The craft also carries a camera to take images of the Earth and acts as a transponder to relay amateur radio signals.

The first satellite designed and built by European students was the UOSAT-1 built by UK university graduates over 21 years ago.

Radio amateur Graham Shirville, G3VZV, who masterminded the telecommunications side of the SSETI Express, said: "The prime purpose of the project is to demonstrate that students, with assistance from an organisation like the European Space Agency, can design and build a satellite well-enough [for flight in space]."

SSETI Express is the first mission as part of the Student Space Exploration and Technology Initiative (SSETI), a European Space Agency-backed project to develop expertise in space among students.

Following on from the SSETI Express, the students plan to construct and launch several micro-satellites and potentially more complex projects such as a moon lander.

Yaesu launches "most advanced" amateur transceivers in the UK

Amateur radio equipment maker Yaesu has launched its new FT DX9000 range of transceivers in the UK. The transceivers are described by the company as the most advanced ever developed for the amateur market and boast impressive specifications.

There are three models: the entry level FT DX 9000 Contest with a price tag of £3,799; the flagship FT DX 9000D with TFT screen retailing at £7,299; and the super-powerful FT DX 9000MP costing £8,299. The 9000D has been available in the UK since November while the company will be taking orders for the 9000MP and 9000 Contest from January next year.

The FT DX9000D, which is expected to be the most popular of the three models, comes with 200W of power, a large TFT screen, dual receive, main/sub receiver VRF and 50V/12A internal PSU. The main difference with the budget Contest model is that it has two meters in place of the TFT screen and lacks dual receive. The MP also has two meters instead of the TFT screen but boasts dual-receive, 400W of power and a 50V/24A external PSU with built-in speakers. For detailed specifications, visit Yaesu's website: www.yaesu.com.

All three models feature state-of-the-art electronics, notably the world's first 400MHz high resolution direct digital synthesizer to ensure weak signal reception in a high level multi-signal environment. The front panel of the transceivers, featuring 37 knobs and 96 buttons in the case of the FT DX 9000D, has been designed with great attention to ergonomics. The displays and meters, for example, are curved slightly inwards to give the user better visibility.

According to Yaesu, "with the FT DX 9000, you'll marvel at how your expectations are exceeded every time you turn on the rig". *RadCom* will be running an in-depth review of the FT DX 9000 range by Peter Hart in an upcoming issue of the magazine.

The FT DX 9000 Contest

The FT DX 9000D

The FT DX 9000MP

Season's Greetings

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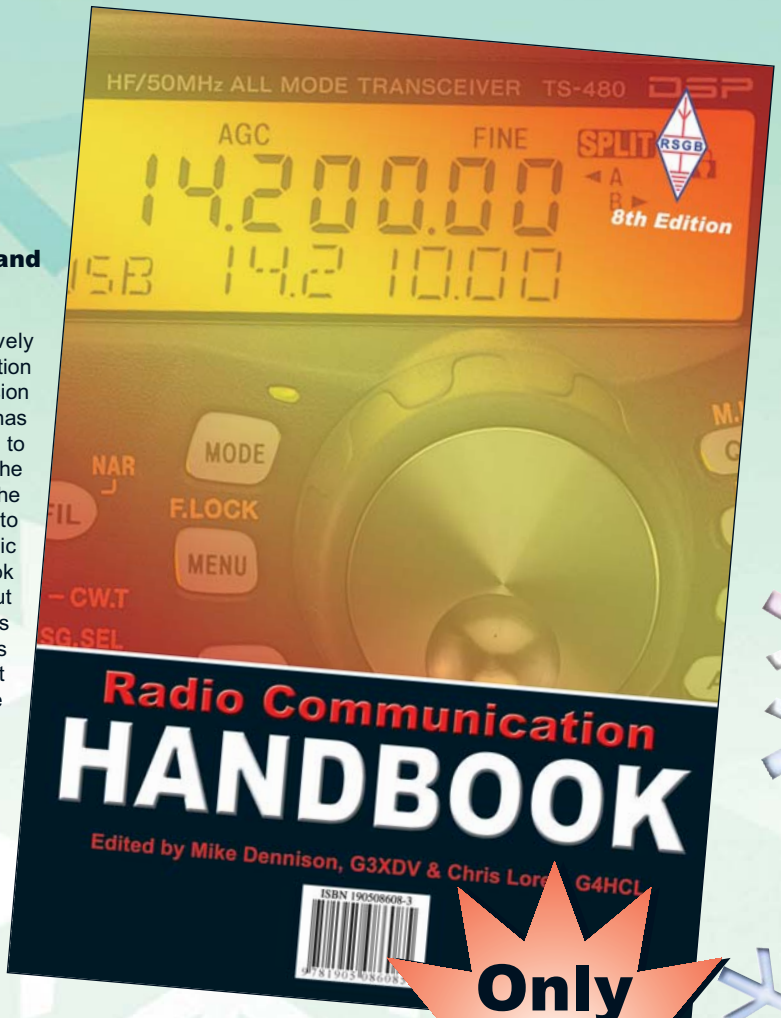
The RSGB Radio Communication Handbook

8th edition
Edited by Mike Dennison, G3XDV and Chris Lorek, G4HCL



Many books claim to have been extensively revised however the RSGB Radio Communication Handbook, 8th edition has had the largest revision for many an edition. Once again, the RSGB has recruited experts on a wide variety of subjects to produce the most comprehensive guide to the practical side of amateur radio. Covering the entire spectrum from the basics through to advanced projects, and including many classic circuits, the Radio Communication Handbook makes an essential shack accessory. Just about everyone will find items of great value in this great book. Chapters vary from the essentials right through to detailed ones on specialist topics. For the experienced radio amateur there are hosts of new ideas, including modern techniques such as microprocessors, surface mount components and computer aids to designing circuits and antennas. The book also contains for the first time since the original 20-part RadCom serial the 'PIC-A-STAR' brainchild of Peter Rhodes, G3XJP. This is a complete transceiver project, based around PIC technology and giving state-of-the-art performance. Appendices contain all the useful reference data and artwork for printed circuit boards. With 26 chapters spread over 768 pages this is packed with far more ever than can be detailed here.

Only £25.49 plus p&p

FREE CD

If this updated book were not enough you can now search every page of the RSGB Radio Communication Handbook, 8th edition at the touch of a button. A free CD is enclosed in the book that contains a searchable and printable version of the book. This makes the book incredibly easy to navigate and finding that important page has never been easier. The ability to print individual pages is a significant bonus for every experimenter and builder wishing to use those all important circuit diagrams.

* New larger format
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* Complete PIC-A-STAR transceiver project
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Non members price £29.99 plus p&p

ITS BACK !

BIGGER & BETTER THAN EVER BEFORE

Foundation is perfect introduction to electronics

A small Essex company has put two of its employees through the RCF Foundation Licence course with the aim of giving them an introduction to electronics.

Michelle Stiffel and Hugh Montgomerie, both apprentices with electronics company RPF Technical Services, described the Foundation course as "'fun yet informative". They also said that the course had helped them in their work with RPF.

The company's managing director Phil Osborne – who is also the South Essex Area Raynet controller – explained why he decided to send Michelle and Hugh on the course. "I suggested the course to my staff partly as a way of getting more young people interested in the hobby and partly to give them an introduction to electronics. The whole exercise has been a great success and I'm thrilled by the outcome."

PHOTO: M5AKA

Michelle and Hugh undergoing training

The two apprentices are now continuing their training by starting ONC courses in electronics engineering. The Foundation course that Michelle and Hugh took was provided by the Chelmsford Amateur Radio Society. Other companies interested in sending their staff on the Foundation course should contact their local amateur radio club. Alternatively, phone the Radio Society of Great Britain on 0870 904 7373.

The Chelmsford Amateur Radio Society will be running another evening Foundation Course starting on 12 January. For further information, contact club training manager Clive Ward, M0SIX - tel: 01245 224577, mob: 07860 418835, e-mail: training2006@g0mwt.org.uk

Lions team up with radio amateurs

Lions Club International – the world's largest volunteer service organisation – is launching a series of events aimed at building links with amateur radio enthusiasts. One of the initiatives is a special event station to be operated by the Bedworth Lions Club from 1-28 January 2006. The station will operate on 2m FM and 80-10m SSB with the callsign GB4BLC.

The station will be manned by Bedworth Lions Club member Brian, G8GMU. His QTH will be open to the public for the month of January with the aim of highlighting the work of Lions clubs and demonstrating amateur radio.

Also in January Lions Club International will be running the popular Lions on the Air contest. For more details about both events, visit the Bedworth Lions website (www.lions105m.org.uk/~bedworth) or phone Brian on 024 7637 4235.

There are already strong links between amateur radio and Lions Clubs International. Lions clubs operate several amateur radio stations for humanitarian relief purposes, notably the Lions permanent station – VU2LCI. The organisation's disaster manager Ajoy, VU2JHM, is also an amateur radio enthusiast.

Like radio amateurs, members of Lions Club International also get involved in relief efforts following major disasters. More than 73,000 so-called Lions were involved in the aftermath of the Asian tsunami.

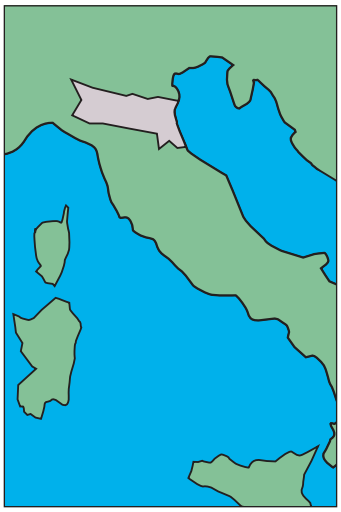
Hams involved in earthquake communications

RadCom has received reports of radio amateurs helping in the relief effort following the devastating earthquake that struck the Kashmir region of Pakistan in October. Nasir, AP2NK, president of the Pakistan Amateur Radio Society, said: "It is a terrible situation with destruction over a big area of difficult mountain terrain. Hams and short wave listeners are helping in the distribution of relief items. More teams are moving into different towns so that welfare messages can be exchanged as the available telephone network is overloaded."

He also informed *RadCom* that radio amateurs were working with the official radio network of forest stations to help exchange welfare messages in areas where telephones were not available.

Horey Majumdar, VU2HFR, reported that: "There has been some ham disaster communication from Pakistan" mainly on 7.100MHz. He also said that hams from Turkey had entered Pakistan to assist in relief operations. VU2RBI, meanwhile, said that Pakistani hams had been relaying earthquake-related traffic, but admitted that few amateur radio stations had at that time been established in the hardest-hit areas, some of which are very remote with difficult access.

The earthquake is estimated to have killed more than 55,000 people, injured another 78,000 and left three million homeless. There are fears that the death toll could rise if the homeless are not provided with shelter before the onset of the harsh Pakistani winter.



New Red Cross station goes on air for the first time

The Italian Red Cross activated its new amateur radio station for the first time on 16 October under the callsign IZ4GQA. Further transmissions were made on 23 and 30 October. Details of the frequencies, operating modes and schedule of the transmissions can be found on a special website - radio.cribo.it

The pioneering new station is the brainchild of the radio communications department of the Italian Red Cross's Emilia Romagna region. The department had been looking for a communication tool that would provide wider coverage than existing radio networks, incur no fees and be capable of working in crisis and emergency situations.

An amateur radio station appeared to be the perfect solution. But at the time the Italian Red Cross had never before been authorised to operate such a station. Not to be put off, members of the radio communications department obtained a copy of the official Italian amateur radio regulations and submitted a seven-page application for a licence to the Italian ministry of communications.

The application was successful and the Italian Red Cross was given the green light to operate an amateur radio station. An Italian Red Cross spokesman said: "Now we can communicate on all ham bands, being able to connect Red Cross stations not only in our region, not only in Italy, but all over the world."

Website for remote operation connoisseurs

UK radio amateurs interested in remote operation will be pleased to hear that a new yahoo group has been set up on this interesting subject. Dave, G3UEG, decided to form the private group for those with a serious interest in remote operation after receiving a positive response to a presentation he made at the recent HF Convention.

Dave has written extensively about remote operation in a recent series of articles published in *RadCom*. He plans to work with a number of fellow experts to make the yahoo group a mine of useful information and research on remote operation. He says: "As well as the technical issues we will also be trying to promote the inclusion of remote operation into the standard licence."

The remote operation yahoo group is called Remote_AR_UK and the subscribe e-mail address is: Remote_AR_UK-subscribe @yahoogroups.com.

Longstanding amateur radio magazine to end publication

Short Wave Magazine – the popular UK joural for radio amateurs – will cease publication as a separate title in January 2006. The magazine's publisher, Dorset-based PW Publishing, has decided to merge the title with another of its publications, *Radio Active*, to form a new magazine called *RadioUser*.

Radio Active editor Elaine Richards said that the aim of the merger was to create a better magazine. "The publishers are picking the best bits out of both magazines to create a new title. The publishers are still finalising their plans, but we will be able to give more detail when the December issues [of *Short Wave Magazine* and *Radio Active*] appear in print."

Elaine also stressed that PW Publishing's flagship amateur radio publication, *Practical Wireless*, will not be affected by the changes. She said: "There's no reason to merge *PW* with anything else as it's in a class of its own. It's staying exactly as it is."

Two new radios from Icom

Radio maker Icom has provided details of two forthcoming products, the IC-7000 all-mode HF/VHF/UHF transceiver; and the IC-E7 2m/430Mhz dual-band radio. A prototype of the IC-E7 was on display for the first time outside Japan at the recent Leicester Amateur Radio Show.

The IC-7000, designed for use in the shack, car or on the move, offers 100W of power on the HF/50Mhz bands, 35W on the 430/440MHz bands and 50W on 144MHz. It offers digital noise reduction to improve signal-to-noise ratio and cut out pulse type noises from engine ignition and sparking.

The IC-E7 is a 130g handheld perfect for use with repeaters. It offers up to 20 hours of battery power, 500 memory channels and a large, high contrast back-lit LCD.

The IC-E7

The IC-7000

NEWS BRIEFS

- **A new website for downloading software for radio amateurs and other radio users has just gone live at http://radiolinux.co.uk. The site offers mainly Linux programs but there is also some Windows software available. The site's owner intends to expand the range of software available from the site over coming months.**
- **Ofcom has announced plans to offer radio astronomers a new spectrum management mechanism called 'recognised spectrum access' that will offer greater certainty over the levels of interference in the frequencies they use. More details can be found on the Ofcom website.**
- **The Australian Communications and Media Authority has given the Wireless Institute of Australia the green light to use the AX prefix to celebrate the 2006 Commonwealth Games in Melbourne. The AX prefix can now be used by all Australian radio amateurs for the period from 1-31 March 2006.**
- **Angie Sitton, G0HGA, has set up a bulletin board website – s14.invisionfree.com/HamsComputersMorse/index.php – for debating and researching the use of computers by radio hams. According to Angie, the site "provides areas for many aspects of usual and radio oriented computing as well as radio forums and a ragchew area".**
- **Japanese company Tokyoflash has launched what it claims is the first ever Morse Code watch – www.tokyoflash.com/UKviewwatch76H1.html. The clock uses a built in speaker that refracts the sound off your wrist to sound out the time in Morse Code. The time is also displayed in Morse Code on an LED display.**

LDG makes ML&S its main UK distributor

Amateur radio retailer Martin Lynch & Sons (ML&S) has been appointed the main UK and Ireland distributor for LDG's product range. LDG is best known for its automatic antenna tuners and related products. ML&S now stocks the company's entire range including the budget Z-100 auto ATU at £119.95 and the new top-end 1kw AT-1000 Auto Tuner at £499.95.

ML&S sales director Chris Taylor said: "We have wanted to add LDG's product line to our range for several years and are delighted that we have finally been able to cement the relationship with the US factory. LDG make quality products at very low prices and we have already purchased large quantities to ensure fast delivery."

Club and regional news

1 Scotland South & Western Isles

AYR AMATEUR RADIO GROUP
5 Foundation Course
14 Digital Audio Broadcasting – Gordon McArthur
John, 01292 443 580, john@numidata.com
COCKENZIE & PORT SETON ARC
3 Club Christmas Night
Bob, GM4UYZ, 01875 811 723
KILMARNOCK & LOUDOUN ARC
13 Bright sparks quiz evening
Len, GM0ONX, 01563 534 383
PAISLEY (YMCA) ARC
14 Using an Oscilloscope
21 Party Night
28 Christmas Break
Jim, GM3UWX

2 Scotland North & Northern Isles

ABERDEEN ARS
1 last junk sale for 2005
8 construction night/on air
15 construction night/on air
22 Club Christmas party. No meeting for Christmas holiday
Ellis, GM4JLZ, 01224 580 594

3 North West

CHESTER & DARS
3 AGM
6 Xmas Social Burley Hall
Derrick, M1SUM, 0151 356 1572
SOUTH MANCHESTER R & CC
2 Talk – Crystal Oven Temperature Control Experiments - by Ron G3SVW
9 Discussion on Technological Gizmos
16 Members' Home made Equipment Competition
23 Christmas Party.
Club closed 30th December
Ron, 0161 969 3999
STOCKPORT RS
6 Annual General Meeting
20 Chairman's evening – Aerial Photography 2 with Nigel Roscoe, G0RXA
David, M1ANT, 0161 456 7832
WIRRAL & DARC
2 (Fri) Xmas Dinner
7 D&W The Green Lodge, Hoylake
14 Chairman's Night
21 The Black Horse, Heswall
28 D&W The Wheatsheaf, Raby
Tom, G4BKF, 07050 291 850

4 North East

BISHOP AUCKLAND RAC
4 Rally at Spennymoor Leisure Centre
Mark, G0GFG, 01388 745 353
GREAT LUMLEY AR & ES
7 OTA
14 Talk by speaker and Christmas Meal
21 OTA
28 OTA
Nancy, 0191 477 0036, 07990 760 920, nancybone2001@yahoo.co.uk
HALIFAX & DARS
6 Quiz and buffet
Tom, M0TKA, 01484 715 079
HORNSEA ARC
7 Talk by Bill, G3RMX
14 Activity Night
21 Christmas Party.
No meeting 28th December
Richard, G4YTV, 01964 562 498, g4ytv@aol.com
KEIGHLEY ARS
15 Xmas buffet.
No meeting on 29th December
Kath, G0OSA, 01535 656 155
NORTH WAKEFIELD RC
8 Talk by John, G3LZQ, on log book of the world
22 Club Christmas Party with live music by club members
Nigel, 0113 253 0558
SHEFFIELD ARC
5 Talk – Andrew Bennett (G0HSA) '2m antennas on a shoestring'
12 Operating Evening
19 Christmas Meal. Closed 26th December for Christmas Holiday
Nick, G4FAL, 0114 255 2893

5 West Midlands

CHELTENHAM ARA
2 AGM
Pat, G3IKR, 01386 792 542
COVENTRY ARS
9 Night on the air, Novice class, cw practice
23 Night on the air, Novice class, cw practice
John, G8SEQ, 024 7627 3190
GLOUCESTER AR & ES
5 Illustrated talk – The Tidal Severn
12 Christmas Buffet
Tony, 01452 618 930, Daytime
MALVERN HILLS RAC
13 Annual General Meeting
Mike, G3TGD, 01905 830 752
MID-WARWICKSHIRE ARS
13 Christmas Meeting
Bernard, M1AUK, 01926 420 913
STAFFORD & DARS
1 Live demonstration of weather Satellite APT Reception – John G0FSM
8 Shack night and committee meeting
15 Christmas Drinks and Nibbles
Graeme, G4NVH, 01785 604 534, graeme.boull@ntlworld.com
STOURBRIDGE & DISTRICT ARS
5 Social/On Air Night
12 Open Shack Night
19 Xmas Bash
26 Open Shack Night
John, M1EJG (01562 700513), www.g6oi.org.uk
STRATFORD UPON AVON DRS
12 Test equipment evening, G0JUQ
25 Christmas greetings on the air (145.275MHz)
26 Festive natter night
Jack, G3VYE, 01926 641988
TELFORD & DARS
14 Christmas Dinner
21 Xmas social at HQ. HQ closed 28th Dec
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@aol.com

6 North Wales

DRAGON ARC
19 Christmas party
Leslie, 01248 470 606
WREXHAM & DARS
6 Christmas Dinner
Mark, MW1MDH, markmdh@btopenworld.com

7 South Wales

CARMARTHEN ARS
5 Open meeting and radio activity night
20 Mince pie social evening
Martin, GW3XJQ, 01994 453 495

8 Northern Ireland

BANGOR & DARC
7 The QSL bureau by Harry, GI4JTF, and electronic QSLs by Pete, GI4VIV
Mike, GI4XSF, 02842 772 383

9 London & Thames Valley

AYLESBURY VALE RS
14 Chairman's mince pies evening
Roger, G3MEH, 01442 826 651, roger@g3meh.com
COULSDON AMATEUR TRANSMITTING SOCIETY
12 AGM
Steve, G7SYO, 01737 354 271
CRAY VALLEY RS
2 Chairman's Xmas Meal – G3NPS/G3JJZ
6 2m Club Championship Contest
15 Xmas Social – Jolly Fenman, Blackfen
Richard, G7GLW, 07831 715 797, rcains@btinternet.com
CRYSTAL PALACE RADIO & ELECTRONICS CLUB
2 Christmas Experience
Nick, 020 8689 2145
DORKING & DISTRICT RS
8 Xmas Dinner, Stepping Stones PH, West Humble G3AEZ
Walter, G3JKV, 01306 884 359, wb@g3jkv.co.uk
HODDESDON RC
6 Test equipment demonstration
20 Christmas nibbles night
Don, G3JNJ, 020 8292 3678
READING & DARC
8 AGM. No second meeting in December
Pete, G8FRC, 01189 695 697
SHEFFORD & DARS
1 Computers and Radio by Ian Bateman
15 Mince Pie Evening
David, G8UOD, 01234 742 757
SILVERTHORN RC
2 Informal evening
9 On the air night
16 Provisional date for Christmas party
Les, G0CIB, 07980 275 081
SOUTHGATE ARC
8 2005 AGM
Mike, M0ASA, 020 8366 0698
STEVENAGE & DARS
6 The return of the valve. Sean, M1ECY, and Chris, G1RPO
13 Christmas Meal
Neil, M0ARH, 01438 217 077
SURREY RADIO CONTACT CLUB
5 Hybrid Cars by Peter Bruce, G4WPB
Ray, G4FFY, 020 8644 7589
SUTTON & CHEAM RS
8 Christmas Junk Sale
John, G0BWV, 020 8644 9945, info@scrs.org.uk
WEY VALLEY ARG
2 Vertical v horizontal. George Dodd, G0HIP, asks 'can we improve our club antenna?'
16 Club Christmas get-together plus@ G6XN on-air to work Santa Claus.
Andrew, M0GJH, 01483 272 456

10 South & South East

BASINGSTOKE ARC
5 Club meeting Ladies Night
27 Foxhunt Turkey settler
Frank, M0AEU, barc@2lo.info
FAREHAM & DARS
7 The Magic Eye by Andrew, G0AMS
14 Short talks and pies
21 Natter night and Club Station Operating with G3VEF/G8KGI – No meeting 28th December
enquiries@fareham-darc.co.uk
HARWELL ARS
13 AGM
Angus, G0UGO, 01235 522 858
HORNDEAN & DARC
6 Social Evening
13 Lunchtime Christmas meal
15 Evening Christmas meal.
No meeting 27 December
Stuart, G0FYX, 023 9247 2846
HORSHAM ARC
1 AGM
David, G4JHI, 01403 252 202
ITCHEN VALLEY RC
9 Radar – Quintin, M1ENU
16 Social – Sheila G0VNI/Jim 2E0FKG
Sheila, G0VNI, 023 8081 3827, sheila.williams@ivarc.org.uk
MID-SUSSEX ARS
2 Christmas Supper
9 Radio night and table top sale
16 Christmas Quiz and mince pies
John, G6XTW, 01273 588 556
SWINDON & DARC
8 Inter-Club Fun Quiz
15 Club Christmas Dinner
Mike, M5CBS, 01793 826 465
TROWBRIDGE & DARC
7 Christmas Social and Presentation Night
21 Natter Night
Ian, G0GRI, 01225 864 698, E/W
WORTHING & DARC
7 What is it quiz – G8MSQ
14 Christmas Party and Club awards
21 Christmas discussions
Roy, G4GPX, 01903 753 893

11 South West & Channel Islands

APPLEDORE & DARC
19 Christmas Party
Brian, M0BRB, brian.jewell@ic24.net
BOURNEMOUTH RS
2 Presidents Pint
16 Open meeting – Test and measurement gear
David, G4BKE, 01202 697 338
CORNISH RADIO AMATEUR CLUB
1 Club Christmas Party
John, G4LJY, 01872 863 849
EXMOUTH ARC
7 Christmas Party
Mike, G1GZG, 01395 274 172
FLIGHT REFUELLING ARS
11 Noise in RF Systems, G0NZO
Tony, G3PFM, 01202 622 262
HOLSWORTHY ARC
7 Xmas party

David, 01288 353 561, m3eoq@hotmail.com
PLYMOUTH RC
13 Sherry and Mince Pies
Frank, G7LUL, frank@foxonezero.fsnet.co.uk
POLDHU ARC
13 Talk by KV6LEE – Marconi's achievement
Carolyn, M0ADA, 01326 240 144, carolyn@mullionline.com
SALTASH & DARC
1 Social Evening Sherry and Mince Pies
Brian, M0BHG, 01752 824 321
SOUTH BRISTOL ARC
7 Computer and software clinic
14 Christmas social
21 Celebrating a Record Year, G7LPP Fred
28 On the air evening.
Len, G4RZY, 01275 834 282
SOUTH DORSET RS
13 Skittles and Buffet Night
Carol, 2E1RBH, 01305 820 400, carolonfraggle@tiscali.co.uk
TAUNTON & DARC
4 The 2nd part of G0PSE's talk on "The Basic Radio Amateur Station"
18 Club Night
William, G3WNI, 01823 666 234, g3wni@btinternet.com
THORNBURY & SOUTH GLOUCESTERSHIRE ARC
7 PSK Evening
14 Club quiz and social evening. No meetings 21, 28 December
Tony, G0WMB, tonytsgarc@beeb.net
TORBAY ARS
16 Annual Inter Club Quiz and Christmas Party
Dave, G6FSP, g6fsp@tars.org.uk
YEOVIL ARC
1 Raynet, G6DUN
8 Quiz Night
15 2m Revisited, G3ICO
22 Mince pies on the air
29 Christmas Workshop Evening
Adrian, G4JBH, 07834 922 858, info@yeovil-arc.com

12 East & East Anglia

BRAINTREE & DARS
5 Data Mode Operating evening
19 Christmas Social
John, M5AJB, 01787 460 947
CAMBRIDGE & DARC
9 Assembling and calibrating K2 transceivers, Bob, G3PJT
16 Christmas Party. Club Closed until 6 January
Ian, G4AKD, 01954 782 974
CHELMSFORD ARS
6 Christmas Party
Martyn, G1EFL, 01245 469 008
EAST KENT RS
6 EKRS Christmas dinner at The rising sun, Beltinge
Paul, G3VJF, clubnews@paulnic.com
HARWICH AMATEUR RADIO INTEREST GROUP
14 AGM and Xmas party
Tony, G4EYE, 01255 886 065
HAVERING & DRC
14 Contest DVD (part 2 of 2)
21 Queens theatre Xmas drink. Club closed 28 December
Dave, 2E0EBV, 07956 594 514
LEISTON ARC
6 Christmas Dinner
Paul, M3MIG, 01728 746 044, m3mig@aol.com
LOUGHTON & EPPING FOREST ARS
9 Christmas dinner, Blubeckers, Chigwell Row. No meeting 23rd December
Marc, G0TOC, 020 8502 1645, info@lefars.org.uk
NORFOLK ARC
7 E-bay questions and answers, David, G7URP, and Mark, G0LGI
14 Xmas Party
Reg, G0VDO, 01603 429 269
SOUTH ESSEX ARS
7 Awards evening. No meeting 21 Dec
Dave, southessex.ars@btinternet.com

13 East Midlands

DERBY & DARS
6 Junk Sale
20 Christmas social – bring along some goodies. No meeting 27 December
Martin, G3SZJ, 01332 556 875
EAGLE RADIO GROUP
14 Nevil, G3VDV, reviews the last 12 months and looks forward to 2006
Terry, G0SWS, 07979 733 640
LEICESTER RS & CC
5 Quarterly Open Meeting
12 construction, video, on air
19 Mince pies and sherry social evening
26 Club closed
Tom, G1IUT, 0116 286 3949, tomchristmas@ukonline.co.uk
LINCOLN SHORT-WAVE CLUB
7 G5FZ on air
14 video night
21 raffle night
28 shack activity
John, G1TSL, 01526 323 153
LOUGHBOROUGH & DARC
6 Fun quiz. Another Ian special
13 2A tale of Albert's boat, Albert, G1KSC
20 Christmas drink at the Black Swan. No meeting 27 December
Chris, G1ETZ, 01509 504 319
MELTON MOWBRAY ARS
16 Christmas Raffle, trophies, swap shop etc
Phil, G4LWB, phil@croxtonkerr.fsnet.co.uk
RAF WADDINGTON ARC
8 Club Christmas Dinner
Mike, M1MSF, 07743 687 829

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.

CLUB OF THE MONTH

Educating radio amateurs in operation and technology is a key role of any radio club and it is an area in which Warrington Amateur Radio Club excels. Hence, why we have selected it to be our December Club of the Month.

Warrington Amateur Radio Club, G0WRS, was formed in 1946 by a group of local radio amateurs and originally operated under the callsign G3CKR. The club soon after took part in the National Field Day in 1947 and also set up an exhibition station at the Warrington centenary celebrations.

From 1966, the club has been based in the Grappenhall Community Centre where it has a well equipped shack. The club has used a variety of home-built and commercial equipment over the years and the current line-up includes a three-element SteppIR yagi antenna for 20-6m supplemented by a wire antenna for the lower bands, an Icom 756 PROII transceiver and an Ameritron solid state linear amplifier.

To conform with planning permission the SteppIR can be lowered to roof level when not in use and raising and lowering is done from within the shack. A transceiver interface connected to the antenna control box reads the tuned frequency and automatically adjusts the SteppIR elements to give a 1:1 SWR on the bands covered. The aim is to make the operation of the club equipment as user friendly as possible and encourage all members to participate. The club owns a wide range of test equipment and technical books, all of which are available on free loan to members. Talks, demonstrations and discussions take place weekly and the ability to project computer images on a large screen is an invaluable aid to speakers.

Daily contact between members is maintained by a 2m morning net and Thursday evenings are set aside for another VHF net. Almost all members are now on the internet and in touch by e-mail and can keep up to date by accessing the club website. A free bi-monthly club magazine is issued to members and contains news, views and technical articles submitted by members.

The bar and other facilities of the community centre are available to members before and after meetings, and social events to which families are invited are held at regular intervals. The club attends outside events to demonstrate amateur radio to the public as well as participating in field events and competitions. The latest away fixture was to St George's Island (Looe Island), Cornwall in June 2005 opening that location up for only the fourth time ever. See accompanying picture of the participants setting off to erect the antennas prior to operating.

Formal meetings take place at 8pm each Tuesday in the club shack at Grappenhall Youth and Community Centre, Bellhouse Lane, Grappenhall, Warrington. Further details can be found on the club website www.warc.org.uk or by contacting club secretary John Riley on 01925 762722.

RADIO AMATEURS CELEBRATE BATTLE OF TRAFALGAR BICENTENARY

Cray Valley Amateur Radio Society's special event station – GB200T – to commemorate the 200th anniversary of the Battle of Trafalgar proved hugely successful. Based at the National Maritime Museum in Greenwich, the station achieved a remarkable 13,700 contacts from 121 countries in just eight days (17-24 October).

GB200T was active on all bands from 3.5MHz to 432MHz from 8am to 10pm daily on SSB, CW and the digital modes using transceivers loaned from Icom UK and an Acom 1010 linear amplifier lent by Vine Antenna Products. The club achieved its target of 10,000 contacts two days ahead of schedule, exceeding 1,500 contacts on the special event station's first day of operation. Notable contacts were made with fellow Trafalgar celebration stations GB200RN, GB200HNT, GB4BOT, ZB3TRA and ZL6QH.

The special event not only generated a huge number of contacts but also helped raise the profile of amateur radio. The station was visited on Trafalgar Day by Anna Tribe, the great great great granddaughter of Lord Nelson, whose heroic actions 200 years ago foiled Napoleon's plot to invade England. Greeting messages were also passed to the operators by Nelson scholar Dr Colin White. Further details about the event can be found at a specially designed website – www.gb200t.com – and special QSL cards for those who made contact with the station are available from Cray Valley's QSL manager Owen Cross, G4DFI.

Cray Valley club members operating GB200T

Many other amateur radio clubs up and down the country also put on special events to mark the 200th anniversary of Trafalgar. The Bittern DX Group operated as GB2NNC – Norfolk Nelson's County – on 21-23 October from the Pavilion on the Memorial Park at North Walsham, Norfolk. The station formed part of a three-day commemoration of the 200th anniversary of the death of Horatio Nelson. Nelson was born in Norfolk, attending schools in Norwich and North Walsham before entering the Royal Navy.

The Scarborough Special Events Group meanwhile was on air as GB2OO (Oscar-Oscar) over the weekend of 22 and 23 October again as part of the bicentenary celebrations. The group is issuing a special souvenir QSL card for those who made contact with its station.

The Appledore and District ARC marked the 200th anniversary by transmitting from St Mary's Church in Appledore for three days starting 21 October under the callsign GB2ATW. The club made contacts with as far a way as Alice Springs and Sacremento using a Yaesu FT707.

BRAINTREE RAISES FUNDS FOR THE BLIND

The Braintree and District Amateur Radio Society participated once again this year in the Transmission 2005 event in aid of the British Wireless for the Blind Fund (BWBF). The society has a long tradition of joining in with this worthy initiative.

This year the club used a different location than in the past, after being given permission to use the old USAF Airfield at Gosfield, Essex. Club members set up the station, GX3XG/P, in a tent in the grounds of the airfield. During the weekend of the event, more than 109 contacts were made on HF and 2M.

A spokesman for the club said: "Members always enjoy these events as they make for good social occasions and at the same time we are able to help, in some small way, others less fortunate."

Braintree joined scores of other amateur radio enthusiasts across the country in participating in Transmission 2005. The money raised from the event will be used by the BWBF to distribute specially adapted radios and CD radio cassette for use by blind and partially sighted people.

The BWBF, which was launched by Winston Churchill in 1929, provides the sets on free permanent loan. To find out more about the BWBF, visit www.blind.org.uk.

HEART FM

Amateur radio clubs have a long tradition of raising money for charity and the Cockenzie & Port Seton Amateur Radio Club is keen to maintain this. The club recently presented the British Heart Foundation with a cheque for £845.00. The money was primarily raised by the club's main fund raising event, a radio junk night, held in August. The club started raising money for its adopted charity in 1994 after the sudden death of club member Bunny Anderson and since then has raised an impressive £11,237. Visit www.cpsarc.com or call 01875 811723 for further information about the club.

AWARD FOR CONTACTS WITH LINCOLNSHIRE STATIONS

Radio hams at the Thorpe Camp Museum Radio Station, Tattershall Thorpe, Lincolnshire have launched a new award available to radio amateurs from all over the world. Called the Lincolnshire Award, the accolade will be given to any foreign ham who makes contact with five different radio stations in Lincolnshire.

Residents of England who do not live in Lincolnshire also qualify for the award if they make ten contacts with Lincolnshire stations. Finally, stations based in Lincolnshire have to make 15 contacts with fellow Lincolnshire stations in order to win the award. All contacts must be via radio and not internet modes. The award takes the form of a certificate printed on parchment paper. Contact Tony Nightingale, G3ZPU, at tony@radioman.e7even.com for more details.

SCOTTISH SCOUTS TREATED TO AMATEUR RADIO EXTRAVAGANZA

Dundee Amateur Radio Club (DARC) participated in the annual Jamboree on the Air (JOTA) event for scouts. Club members set up an HF station with vertical aerials, a listening station and a construction area at the Douglas Wood Scout Centre outside Dundee. They helped 21 scouts make contact with other JOTA stations. Around 20 stations were contacted over the weekend, with DX worked on CW.

The scouts were also set the task of building a simple transmitter and sending their names by Morse code to the nearby listening station. Once the scouts had departed, DARC members gave a group of 15 cubs an introduction to radio operation and communications. Great fun was had by all and DARC was invited back to repeat the event next year.

In a separate JOTA event, the DARC club also provided 17 scouts and clubs from six different Angus scout troops and cub packs with six hours of tuition in amateur radio to give them the opportunity to speak to others scouts around the world.

JOTA is an annual event that helps around 500,000 scouts each year to communicate using amateur radio. It has taken place since 1958 and now runs over the third full weekend in October every year.

DIRECTION FINDING OFFERS YOUTH APPEAL

If any further proof was needed that our hobby appeals to the young as much as the old, and women as well as men, we present teenager Rebecca Tyler and her father Stuart, G1ZAR. The father and daughter team took part in a recent direction finding event at Burbage Common. They participated in the 3.5MHz competition and were set the challenge of finding three hidden transmitters in a specific sequence.

Rebecca and Stuart took 47 minutes to find all three transmitters, giving them a respectable 7th place. A minute faster and they would have shot up to 5th place. Full results and details of future direction finding events can be found on the website at: www.btinternet.ardf.co.uk.

Season's Greetings

NEW NEW NEW

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If you are using or want to use balanced feeder, then you are best to get a dedicated balanced tuner for best efficiency. This new unit from MFJ will give you just that. Covering 1.8 - 54MHz it will handle 300W and also tune end fed wires. Lovely build quality, smooth tuning and cross-needle metering.

MFJ-16010 £46.95 B

Our Director, Peter Waters, G3OJV, has used this ATU for years. Basically designed for wire use or coax, it covers 1.8 - 30MHz up to 200W. Its an ideal portable unit and measures just 110 x 83 x 55mm

MFJ-382 £39.95 B

MFJ's amplified speaker is a great way of extending the use of your handheld radio or scanner. It will deliver ip to 1W of good quality audio and can be powered from an internal battery (not supplied) or external 12V supply. A mono to mono lead is included.

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Every station should have a dummy load and this one 1kW for 10 secs befoe cooling or 100W for ten minutes. 50 Ohms 0 - 600MHz. **MFJ-260CN** is similar but with "N" socket. **£44.95**

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Antenna switching is an important part of any station and for low loss results you need a coaxial type. This one is a 4-way design with beautifuly positive movement. SO-239 DC-500MHz, 2kW and up to 60dB isolation.

MFJ-949 £135.95 B

One of the all-time best sellers, this 300W ATU covers 1.8 - 30MHz and handles wire, coax and balanced feed. It also features a built-in dummy load. Cross-needle meters make adjustment very easy and precise.

MFJ-971 £89.95 B

Designed for portable work, this ATU can handle 200W from 1.8 - 30MHz and has a power meter that reads FSD 300W 30W or 6W. Cross needle indicators allow you to prescisely match coax, wire or balanced feeder.

MFJ-904H £109.95 B

The complete travel tuner is all you will ever need for portable or mobile use. 3.5 - 30MHz balanced, wire or coax. And the dual meter makes adjustment a breeze.
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MFJ-993 *New Auto ATU* £209.95 C

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MFJ-392B £22.95 A

The headphones are of the classical design with padded earpieces and have great sound-proofing properties. The tailored response is ideal for radio communications and are provided with adaptor to fit 3.5 or 1/4" stereo sockets.

MFJ-418 £69.95 B

Morse code is still probably the most effective and simple way to communicate - and great fun. Now you can learn it easily and quickly by using this decoder. Carry it in your pocket and learn anywhere. has headphone socket. **MFJ-461** is similar but instead, reads morse when you hold it near a loudspeaker. **£84.95**

MFJ-267 £129.95 B

This is one piece of test equipment that should be in every operator's shack. Only into a dummy load can you get accurate transmit power capability. This one handles up to 1.5kW with 3 power ranges and accurate PEP mode. It can even be left in circuit as there is a thru switch to the antenna! What a great idea!

MFJ-269 £269.95 B

This analyzer covers 1.8 - 170 / 415-470MHz and has the same basic specifications as the MFJ-259Z but is not supplied with batteries, power supply or dip loop. However, it has a very wide UHF range that extends its usefulness to adjusting helical antennas etc. Just connect to antenna or coax and see the truth. A great idea!

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In this month's column, Peter Hart reports on two HF linear amplifiers – the SGC SG-500 and Ameritron ALS-500M – that can help mobile operators boost their power.

Empowering mobile operators

The enthusiastic mobile operator keen to improve his HF DX performance might very well think of adding a linear amplifier to his equipment line-up. Such a decision needs to be properly planned and engineered. High power doesn't lend itself well to 12V power supplies where current drains can reach 100A or more. A heavy-duty battery or a second battery needs to be safely installed with thick, short and fully fused cable runs from the battery to the amplifier to prevent voltage drop. The power output from low voltage amplifiers will drop heavily if the supply voltage sags. Another consideration is the antenna. Very high RF voltages are generated on short high-Q resonant mobile antennas and even corona discharge or flashover is possible. At high power levels safety is of course of paramount importance.

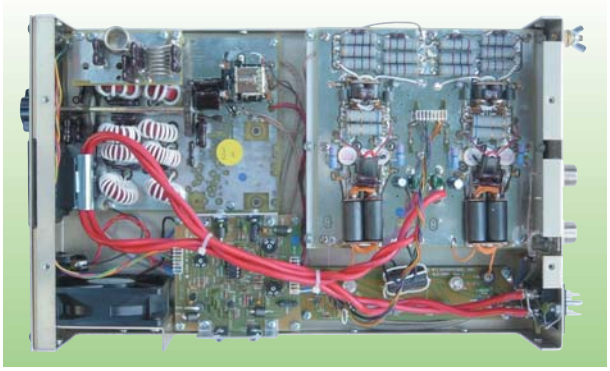
There is a select but limited choice of suitable amplifiers available, and mainly from manufacturers in the USA. This review looks at two such offerings in the 500W power class, the SGC SG-500 SmartPowerCube and the Ameritron ALS-500M. Both have been available for some years now and as a consequence are well established designs. Both are fully semiconductor broadband amplifiers with no tuning required and no warm-up time needed.

AMERITRON ALS-500M

The ALS-500M is rated at 500W PEP output on SSB or 400W output on CW and covers all bands from 1.8 to 30MHz. The standard version sold off the shelf in the USA requires an internal modification to cover 24 and 28MHz. This is a legal requirement for all amplifier sales in that country. Early versions of the amplifier need to be mounted where the operator has access to the front panel controls. Later versions can also be remotely mounted with all front panel controls and indicators replicated on an optional remote control head unit. An upgrade kit is available to allow earlier units also to be used in conjunction with remote control.

ALS-500M linear amplifier

ALS-500M front panel



Inside the ALS-500M showing amplifier, filters and control boards

The amplifier uses a total of four Toshiba 2SC2879 bipolar power transistors arranged as two separate 250W push-pull amplifiers coupled together using hybrid splitters and combiners. A separate PCB contains the temperature compensated biasing circuitry and control for the fan and trips. The output from the amplifier assembly is followed by a low pass filter to reduce harmonics to an acceptable level, and a bandswitch on the front panel or on the remote unit selects one of six filters to cover the entire frequency range.

The whole assembly is constructed on an aluminium chassis with a wrap-around case 23.7cm wide, 9.7cm high and 37cm in depth. It weighs about 3.4kg. Internally, the RF power amplifier is mounted on a finned aluminium heatsink and is cooled by a fan. This is fairly quiet in operation and also only operates when the heatsink temperature rises so there is no fan noise during lengthy periods on receive. The amplifier is switched from the transceiver via a 'ground to transmit' line (12V open, 100mA closed). The main DC power feed is via a plug and socket on the rear panel. The high current lines remain permanently connected but a separate lower current line is used to switch the amplifier on and off. Although the power connector is quite substantial, the current passing through the pins is as much as 80A peak. This is a 10-way connector but only two pins are used to carry the positive feed and two for the ground return. If this were my amplifier, I would parallel up the remaining vacant pins to share the high current load. A power cable is provided but it is quite long and should be shortened to be no longer than necessary. The current drawn by the amplifier is indicated on the front-panel meter.

Protection circuitry is built-in to guard against damage to the power

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transistors. If the heatsink temperature rises excessively, the amplifier is placed in a standby (receive only) condition until the temperature drops to safe limits. If the reflected power on either amplifier output is excessive, due either to a high antenna VSWR or having the wrong output filter selected, a load fault condition is triggered. This can only be reset by turning the power off and on again. Front panel LEDs indicate if either of these conditions has occurred.

The 18 page instruction manual covers the installation and operation of the amplifier and a full set of circuit schematics and parts lists is also included.

The amplifier is rated for full output when operating from a 14V supply. Below this level, Ameritron claims that the power decreases by approximately 85W per volt. It is also safe up to a supply voltage of 16V. I carried out measurements in my garage with the amplifier powered directly from my car battery and with the engine running, resulting in 13.9V measured at the amplifier power plug at full power output. The results are shown in **Tables 1 and 2** (see page 20). Limiting to 100W drive, the maximum power that could be achieved was 435W on 14MHz, 420W on 18MHz, 330W on 21MHz and 480W on 24MHz. Slightly lower powers were achieved using the SGC PS-50 mains power supply which yielded an average supply voltage of 13.3V under full load and 10% pk-pk mains ripple. The amplifier showed significant flat-topping of the two-tone waveform at full output and as a consequence the distortion levels are rather poor at 500W output. I would rate this unit more as a 400W amplifier.

SG-500 linear amplifier

SG-500 hybrid coupled amplifier board

SG-500 filter board

SGC SG-500

The SG-500 SmartPowerCube is rated at 500W PEP output power on all modes and covers all bands from 1.8 to 30MHz. Units sold within the US need a small internal adjustment (jumper change) to enable 28MHz coverage. The amplifier is designed for remote mounting and unattended operation and operates over the supply voltage range of 10 to 18V although 14V is the rated figure. At full power the current consumption is quoted as 90A or 40A average on SSB voice. A separate power supply is available if required for mains power operation, the PS-50, which is an unregulated unit rated at 50A output. This compact but very heavy PSU is rather under-powered for full carrier operation but is suitable for voice modes. Rated at 500W output 50% duty cycle CW for 10 minutes maximum, the SG-500 does not contain a fan but relies on a substantial heatsink. An optional cooling fan is available from SGC which removes the 10 minute time limit. Other fans (cheaper fans) can also be fitted and there is a fan control connector.

The amplifier uses a total of eight Toshiba 2SC2290 bipolar power transistors arranged as four separate 125W push-pull amplifiers. These are coupled together using hybrid splitters and combiners. The 2SC2290 is rated at about two-thirds the power output of the 2SC2879 used in the Ameritron amplifier. The SGC-500 is a more conservatively rated design. The output from the amplifier combiner assembly is followed by relay switched low pass filters to reduce harmonics to an acceptable level. Six filters cover the frequency range and these can be selected either manually or automatically by measuring the frequency of the incoming drive sig-

nal. SGC claims that this takes just 15ms but of course this does involve an element of 'hot switching' and possible wear of the relay contacts. The selected band is indicated on status LEDs.

The whole assembly is contained within a substantial and rugged diecast box with an integral heatsink and measures 27.4cm in width, 12.4cm in height and 30.5cm in depth. Rubber feet add an extra 3cm to the width or height dimensions depending whether the amplifier is horizontally or vertically mounted. The weight is about 9.5kg. The amplifier is switched from the transceiver either manually via a 'ground to transmit' line (PTT) or automatically in RF sensed mode. In RF sensed mode, it requires about 6W of power to switch the amplifier and there is a one second hang time before switching back to the receive state. The DC power is connected via screw terminals but no power lead is provided. The amplifier can be switched on or off either by a switch on the front panel or remotely.

Extensive microprocessor controlled protection circuitry is built-in to guard against damage to the amplifier. This includes excessive current consumption, current imbalance between the amplifiers, excessive heatsink temperature, high antenna VSWR, PTT switching with the RF present or low voltage power supply. If a fault condition occurs, the amplifier trips off-line and needs to be powered down to reset. Status LEDs indicate the fault condition. The normal drive power required for full output is up to 60W and at higher drive levels an input attenuator is automatically switched in circuit to prevent overdrive. An ALC output is available for feeding back to transceivers but the positive-going voltage is incompatible with most radios.

The 32-page instruction manual is well written and includes a full set of circuit schematics.

Tables 3 and 4 show the performance of the amplifier when it is powered from the PS-50 mains PSU, which delivered 13.3V under full load. A good overall performance is achieved at 500W output power.

CONCLUSION

Both amplifiers are well made units and will give a useful increase in output power with the usual 100W transceiver. The ALS-500MXCE is priced in the UK at £819.95 and the SG-500 at £1,399.95 inc VAT. The SGC amplifier is a more conservatively rated design, yielding lower distortion and is a very professional rugged unit but it is significantly more expensive than the Ameritron. The Ameritron delivers 400W (except 21MHz) but is straining to reach 500W. Both amplifiers are available from Waters and Stanton who kindly loaned the units for review. ♦

ALS-500M and SG-500 amplifiers side by side

Table 1 Ameritron ALS-500M measured performance

		DRIVE POWER		HARMONIC OUTPUT	
FREQUENCY	INPUT VSWR	400W O/P	500W O/P	2nd	3rd
1.8 MHz	1.2	31W	45W	-52dB	-56dB
3.5 MHz	1.25	32W	46W	-51dB	-57dB
7 MHz	1.4	29W	65W	-65dB	-55dB
10 MHz	1.6	41W	70W	<-70dB	-62dB
14 MHz	1.6	79W	-	<-70dB	<-70dB
18 MHz	1.7	90W	-	<-70dB	-66dB
21 MHz	1.7	-	-	<-70dB	-68dB
24 MHz	1.7	48W	-	<-70dB	<-70dB
28 MHz	1.5	36W	81W	<-70dB	<-70dB

Table 2 Ameritron ALS-500M two-tone SSB performance

	INTERMODULATION PRODUCTS ref to PEP 400W PEP OUTPUT		INTERMODULATION PRODUCTS ref to PEP 500W PEP OUTPUT	
FREQUENCY	3rd order	5th order	3rd order	5th order
1.8 MHz	-30dB	-50dB	-26dB	-50dB
3.5 MHz	-30dB	-47dB	-25dB	-50dB
7 MHz	-28dB	-48dB	-24dB	-50dB
10 MHz	-28dB	-42dB	-25dB	-40dB
14 MHz	-24dB	-42dB	-	-
18 MHz	-24dB	-42dB	-	-
21 MHz	-	-	-	-
24 MHz	-25dB	-40dB	-22dB	-32dB
28 MHz	-24dB	-42dB	-22dB	-34dB

Table 3 SGC SG-500 measured performance

		DRIVE POWER		HARMONIC OUTPUT	
FREQUENCY	INPUT VSWR	400W O/P	500W O/P	2nd	3rd
1.8 MHz	1.7	19W	26W	<-70dB	-55dB
3.5 MHz	1.8	17W	23W	-61dB	-55dB
7 MHz	2	18W	28W	<-70dB	-56dB
10 MHz	2.4	19W	31W	<-70dB	-42dB
14 MHz	2	24W	39W	<-70dB	-65dB
18 MHz	1.45	32W	53W	<-70dB	-60dB
21 MHz	1.7	29W	70W	<-70dB	-62dB
24 MHz	1.2	21W	31W	-69dB	-63dB
28 MHz	1.9	24W	45W	<-70dB	<-70dB

Table 4 SGC SG-500 two-tone SSB performance

	INTERMODULATION PRODUCTS ref to PEP 400W PEP OUTPUT		INTERMODULATION PRODUCTS ref to PEP 500W PEP OUTPUT	
FREQUENCY	3rd order	5th order	3rd order	5th order
1.8 MHz	-37dB	-46dB	-32dB	-40dB
3.5 MHz	-37dB	-46dB	-32dB	-43dB
7 MHz	-35dB	-45dB	-32dB	-45dB
10 MHz	-34dB	-45dB	-32dB	-45dB
14 MHz	-32dB	-44dB	-30dB	-43dB
18 MHz	-31dB	-44dB	-29dB	-44dB
21 MHz	-29dB	-48dB	-25dB	-44dB
24 MHz	-32dB	-43dB	-28dB	-45dB
28 MHz	-31dB	-40dB	-26dB	-40dB

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Power to the people

A good switch-mode DC power supply should operate at high efficiency, produce minimal electrical noise emissions and not burn a hole in your desk by becoming too hot. Steve White compares three budget power supplies that anyone can afford.

Size and weight are big factors in determining the price of a power supply. Operating from 50Hz mains, a 25-amp linear power supply needs a transformer that is large and heavy. It also requires a large smoothing capacitor. And then there's the regulation circuit, which typically needs multiple pass transistors and a substantial heatsink. It all costs money.

Switch-mode supplies operate in a different way. In simple terms, they rectify and smooth the mains, then chop up the high voltage (about 350V) at tens of kHz. Transformers for higher frequencies are much smaller than those for 50Hz, and on the secondary side the need for the smoothing capacitor also diminishes because much shorter periods of time elapse before it gets topped-up. Take a look at the photos of the insides of the equipment reviewed here and you will find that the mains transformers are pretty insignificant. In the case of the Watson and Microset, they are located between the silver heatsinks that can be seen edge on, while in the Samlex the component with the warning sticker is the transformer.

However, there are downsides to switch-mode supplies, chief of which is that the chopping-up process creates harmonics and noise. Unless a switch-mode supply is designed and built properly, it is virtually guaranteed to emit electrical noise – and maybe quite a lot!

The three supplies we tested

There are numerous switch-mode DC power supplies on the amateur radio market today. Some are more sophisticated than others, with adjustable output voltage, adjustable current limit, and comprehensive voltage and current metering. The supplies reviewed here are all budget models, with: fixed output voltage; no metering; and 25A peak current capacity.

DESCRIPTIONS

Watson W25SM

This supply is housed in a two-part steel case with a fan at the back and vent holes on the sides. There is no heatsinking to the case. This is the only one of the supplies reviewed that can be switched between 110 and 240V mains, plus it has two output connections – a pair of spring-loaded clips (6A maximum load) and a pair of screw terminals/4mm sockets. Power is indicated by an LED on the output.

Samlex SEC-1223

This supply is housed in a substantial two-part steel case that is quite slim. The fan is underneath and the case is vented by louvers on the sides. This is the only one of the supplies reviewed that uses the case as part of the heatsink. The significant semiconductors are bolted to an L-shaped bracket that in turn is bolted to the bottom of the case. The output connections are a pair of screw-down terminals – rather like a high current connector block. Power is indicated by a mains neon.

Microset PTS-124

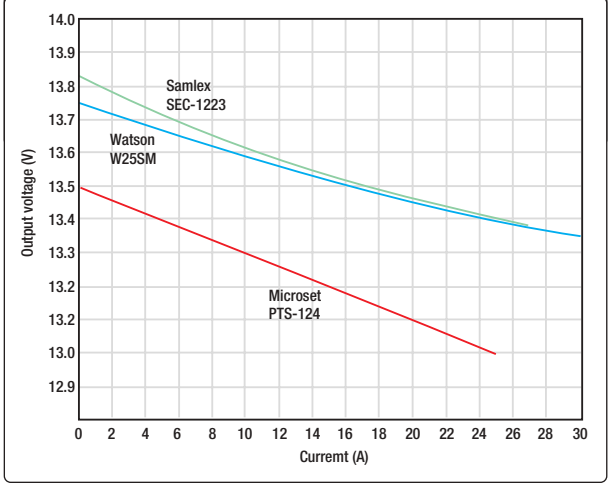
This supply is housed in a narrow two-part steel case with a slide-off cover. The fan is at the back and there are slotted vents on the sides.

SPECIFICATION

	Watson W25SM	Samlex SEC-1223	Microset PTS-124
AC input voltage	100-120, 220-240V	200-260V	190-240V
DC output voltage	13.8V	13.8V	13.5V
Ripple at max output	Not stated	Not stated	20mV
Voltage stability (min-max)	Not stated	Not stated	0.4%
Output current (continuous)	22A	23A	23A
Output current (peak)	25A	25A	25A
Over current protected?	Yes	Yes	Yes
Over temp protected?	Not stated	Not stated	Yes
Size (WxDxH, mm)	180x190x65	180x190x55	110x220x85
Weight	1.8kg	1.6kg	1.4kg
Output connections	Screw terminals / 4mm sockets, Spring clips	Screw-down terminals	Screw terminals / 4mm sockets
Fan	Thermostatic	Fully thermostatic	Thermostatic
Supplied with:	IEC mains lead	IEC mains lead	-
List price	£79.95	£99.95	£99.95

Fig 1 Output voltage against current of the Watson W25SM, Samlex SEC-1223 and Microset PTS-124.

FIG 1 © RADCOM 611



The Watson W25SM

The Samlex SEC-1223

The Microset PTS-124

There is no heatsinking to the case. This is the only one of the supplies reviewed that has two indications of power – a neon on the mains and an LED on the output – and it is also the only one with a captive mains lead.

OPERATION

The supplies were bench tested using a variable load that could draw more then their rated maximum current. Output voltage was measured at various currents (**Fig 1**).

Watson W25SM

The fan ran immediately the mains was turned on and did not change speed throughout testing. After 10 minutes delivering 20A, the case was only slightly warm, indicating high efficiency. From cold, the W25SM delivered 13.75V at the terminals, falling steadily to 13.40V as the load was increased from 0 to 25A. I increased the load to 30A and it still performed, so clearly the Watson supply doesn't give up at its stated maximum. In fact, I had to increase the load to almost 35A before it tripped. After this, it needed a couple of minutes to recover, but recover it did.

Checking electrical noise emission, I found that squeaks and buzzes could be detected a few feet away, but no further. These were emitted from the electronics, not the mains or output leads, so although this supply is just the right size for sitting a compact transceiver on top, I would seriously question the wisdom of doing so.

Samlex SEC-1223

In this supply, the fan does not run all the time, only when needed. However, once it is on, it stays on until it cools the supply back to room temperature. In my tests, that meant seven minutes after the load was disconnected. Also, it was marginally the noisiest fan of the supplies tested. Having said that, after 10 minutes delivering 20A, the case was only slightly warm, once again indicating high efficiency. From cold, the SEC-1223 delivered 13.80V at the terminals, falling steadily to 13.40V as the load was increased from 0 to 25A. It was capable of delivering about 27A before tripping.

An irritation with this supply was that it emitted a buzzing sound that rose in volume as the load was increased. The sound could be substantially quietened by pressing down on top of the case or by placing a weight on top of the supply, but it was always audible.

With regards electrical noise emission on LF and HF, I found that squeaks and buzzes could be detected a few feet away, but no further. Once again, they were emitted from the electronics, not the mains or output leads. This supply is also just the right size for sitting a compact transceiver on top, but once again I wouldn't.

Microset PTS-124

The fan ran immediately the mains was turned on and did not change speed throughout testing. After 10 minutes delivering 20A, there was no detectable change in the temperature of the case, indicating very high efficiency or exceptional cooling.

From cold, the PTS-124 delivered 13.55V at the terminals, dropping steadily to 13.05V as the load was increased from 0 to 25A. This was the lowest voltage of the three supplies tested, but still perfectly OK. When 25A was exceeded, the output voltage fell immediately to zero.

When it came to electrical noise emission on LF and HF, I found that I needed to place my detector quite close to this supply before I was able to hear any. This made the Microset the electrically quietest of the supplies in this review. As with the other supplies, the noise was emitted from the electronics, not the mains or output leads.

CONCLUSIONS

All the supplies performed adequately and stayed remarkably cool when on load test, but purchasers should be aware that they all radiated electrical noise to a certain extent. In each case, it was most noticeable at LF and diminished as frequency increased. This means it would be wise to position them a respectable distance – a minimum of a couple of metres – from any receiving equipment or antennas, especially for the long wave and medium wave broadcast bands and the 136kHz and 1.8MHz amateur bands.

The Watson W25SM stood out from the others because:

- it delivered the most current
- it had the smallest ripple voltage
- it had (marginally) the best regulation
- it is the least expensive
- it is the only dual-voltage supply
- it is the only supply with two output connections

All three supplies are available from Waters & Stanton, to whom thanks are due for loaning them for the review. ♦

THE VERDICT

	Watson W25SM	Samlex SEC-1223	Microset PTS-124
Quality of construction	****	****	***
pk-pk ripple (no load)	***** (4mV @ 77kHz)	*** (140mV @ 67kHz)	**** (20mV @ 111kHz)
Voltage stability	****	****	****
Fan noise (no load)	***	*****	***
Fan noise (20A load)	***	***	***
Electrical noise emission	***	***	****
Audible noise emission	*****	**	*****
Overall approval rating	77%	68%	74%

* = Bad, ** = Poor, *** = Fair, **** = Good, ***** = Excellent

Roger Cooke, G3LDI

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Taming LEOs

The PrimeSat Controller automates the tricky process of communicating using low earth orbiters. Roger Cooke reports.

INTRODUCTION

Communication using low earth orbiter (LEO) satellites requires a high degree of accuracy in the ground station. The timing has to be as precise as possible, certainly to a second or so, the antennas have to be pointing at the satellite all the time, and the receiver and transmitter have to be on the right frequencies. LEOs are only visible, horizon to horizon, for about ten minutes per pass, and data has to be exchanged for as long as possible in that period. The frequencies of both uplink and downlink vary as the satellite passes over, due to the Doppler Effect. This shift in frequency can be as much as 15kHz. Tracking parameters have to be adjusted every few seconds.

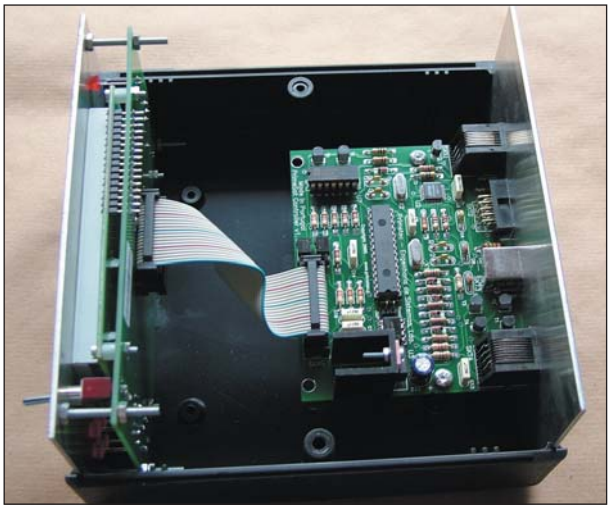
To try and manually control all these variables, for six orbits per day, is virtually impossible, especially if your station is part of the international Satgate Network. Thankfully, these tasks can be automated using tools such as the PrimeSat Controller, making life much easier.

Setting up a satellite station is not for the faint hearted, nor the newcomer. It is not plug and play, and there is a lot of work to be done on the ground station itself, especially with regard to the antenna system. Do not think therefore that just because you have a two band radio and a co-linear that this will be for you.

GENERAL DESCRIPTION.

Manufactured by Primetec in Portugal, the PrimeSat Controller is built into a 160x160x80mm box with the main PCB being about 40x40mm and the display PCB, mounted on the front panel, about the size of the front itself. The heart of the controller is the PIC18F2520 microprocessor. The unit is accompanied by a 26-page, soft cover spiral bound manual. There is also a CD with control software, an electronic manual readable with Acrobat Reader, and several satellite tracking programs. These include SatPC32, Orbitron, Nova, Hamradio Deluxe and Wisp32. As I run a Satellite Gateway, I am familiar with Wisp. Whatever program you decide on, take care in setting it up correctly. Time spent doing this will pay dividends.

The front panel of the controller has a control on/off switch, transmit and receive LEDs and antenna rotator state LEDs. The LCD display shows all relevant parameters for uplink and downlink frequencies,



Above:
Inside the controller

Left:
Back panel

Below:
Primetec Controller hooked into my system

together with both elevation and azimuth antenna positions. There is a pre-set contrast control available as a potentiometer via a small hole in the front panel.

The rear apron has a USB connector to connect the controller to a computer, an RJ45 connector for the rotators and an RJ11 connector for the radio. There is also an IDC connector with jumpers to configure the radio serial connections. Radios catered for by the controller include most of the Icom, Kenwood and Yaesu dual band transceivers that are suitable for satellite communications. Obviously, rotators for a satellite ground station have to rotate in elevation and azimuth. The PrimeSat Controller has a lead, already made up, compatible with the Yaesu models G5400, G5500 and G5600.

A USB computer lead is also made up. And if you specify which radio you have, you might also be able to get a suitable plug put onto the radio lead. I must admit that in the past I had a very bad relationship with an RJ connector. I do not like them, but they seem to be in general use these days. At least the ends of the leads with the controller come already made up, so I would treat those with some respect! No circuit diagram is supplied with the controller.

INSTALLATION AND OPERATION

Just follow the instructions in the manual, and installation should be quite straightforward. However, you must have the rotator plugged in for the unit to be powered up, as it gets 12v from the rotator in order to work. It is also a good idea to be running Windows XP. This platform has few problems now and at least it will recognise the controller on plugging it in. I suffered several problems using W98SE and I am reliably informed that Primetec will be resolving these issues. I really ought to update to XP!

As usual, however, it would be best to read the manual a couple of times prior to installing the controller. Again, follow the instructions in the manual closely and you should not encounter too many problems; most of those will probably be finger trouble. Once a virtual COM port has been set up, the control software has been installed – it then has to be configured correctly. The correct radio and rotator selection must be made, the satellite list checked and one chosen to track.

Operation should be fine, but will depend heavily on your own personal satellite installation, so make sure that all the equipment is installed correctly, beams are aligned on the nose and regular updates are made to Keplerian data, firmware and so on.

I find the best way to align the antenna system is to pick a nice cloud-free, dark evening and use the pole star with a viewing tube. Depending on what satellites you use, a good Gas-FET pre-amp is also necessary on most systems.

There is a mailing list that you can join to discuss problems, news, upgrades and new accessories with regards the PrimeSat. Visit groups.yahoo.com/group/PrimeSATCtrl/. You will have to create a Yahoo account. ♦

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Transceivers: Any, up to 100W
Enclosure: Sealed ABS Plastic
Waterproof
Weather Protected
9 Ft. Cable Supplied

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Frequency Range: 1.8 - 30MHz
Power Range: 1.5 - 200W PEP
Antenna Matching: Better than 2:1
< 4 seconds initially (typical)
< .01 seconds from memory
Antennas: Any
40 Ft. (> 3.3MHz)
100 Ft. (< 3.3MHz)
Transceivers: Any, up to 200W
Enclosure: Aluminum Housing
Not Weather Protected
No Cables Supplied

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Power Range: 1.5 - 200W PEP
Antenna Matching: Better than 2:1
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< .01 seconds from memory
Antennas: Any, up to 5 outputs
40 Ft. (> 3.3MHz)
100 Ft. (< 3.3MHz)
Transceiver: Any, up to 200W
Enclosure: Extruded Metal
Not Weather Protected
No Cables Supplied

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Andy Cook, G4PIQ, **John Simkins,** G8IYS

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Battle stations

Nothing beats being in the Caribbean. Lounging around on a pristine beach, the sun on your back, a glass of Malibu in your hand – it's heaven. Unfortunately for the participants, the VHF National Field Day took place in the UK and some had to endure severe rain and gales. Still, this did not stop them putting in a great performance, as John Simkins, G8IYS, and Andy Cook, G4PIQ, report.

The problem with any contest report is that someone, somewhere, will say: "Well, it wasn't like that here!" – and of course they would be right from their perspective. Anticipating such a divergence of views, we may as well start with the weather where we can probably agree that across the UK as a whole it was somewhat better than in 2004 – but that's not saying much! The Met Office summary of the weekend for England, Wales and Northern Ireland used the terms "unsettled, changeable and showers". It reported the same for Scotland, but also casually remarked that the West and North West of Scotland suffered rain and gales on the Sunday. Of course, when you're on a hilltop with lots of aluminium and canvas, a little extra rain and wind can be quite difficult to handle.

Mid-Lanark, in IO85, were pleased that their antennas held up in the high winds, but their 6m tent failed the stress test. The combined team of GM3TAL, G3SHK and G3RWF, in IO75, said that the wind was at Force 5/6 most of the time – with squalls at Gale Force 8. The bright side was that they suffered no problems with lack of driving force for their wind turbine generators! Cockenzie & Port Seton, in IO84, pondered a second eight-element antenna, stacked, for 4m but sensibly concluded that it would not remain aloft for long. Lothians, from IO74, had to lower their 4m mast twice to refix the couplings – this was a scary exercise with the big yagi bowing in the high winds. However, their four-yagi 2m array succumbed in some style when winds increased to Gale Force and a rotator casting sheared in two.

Up in the far North, Clive O'Hennessy, GM4VVX/P, was down to a one man entry and at times had to hold the Armstrong rotator to stop it spinning like a rotary clothes line. This left him one hand to hold the clipboard, pen and mike on his lap, but on almost every QSO either the pen or clipboard fell on the floor, resulting in several old Anglo Saxon expletives. Another one-man band, Allan Duncan, GM4ZUK/P, also feared for the safety of his 2m array, but he and it survived to tell the tale.

Moving to the south east of England, the weather was windy, but not as bad as in Scotland: Clifton, in JO01, used an Armstrong rotator on 6m, but their arms were just not strong enough to hold their big yagi in the wind. In the same square, Reigate and Crawley were pleased that the winds of 2004 did not revisit them since their 100ft tower, supporting a stack of 4 x 28 ele 70cm yagis, may not have survived with its temporary support for a broken tower stabiliser. In contrast, West Bromwich Central in IO92 and Sheffield, participating for the first time for some years, in IO93, reported that Sunday was dry, bright and sunny.

Other diversions beset a number of stations. Swindon, with maybe just a little understatement, reported: "a little trouble with our 4m transverter". Wrexham simply commented "70cm PSU blew up..." and Clifton suffered a defective antenna changeover relay – leading to 4m receiver deafness. Sutton Coldfield got through two versions of their on-line computer log – finally adopting a third as a post-log and MIDCARS confessed to insufficient practice with computer log inputting. Their generator ran out of fuel 45 minutes before the end – perhaps due to running the tea urn as well as the amplifiers but spirits were raised by a free firework display from a Live8 concert site. The traditional generator theme continues with the Surrey team whose machine worked for 18 hours without hitch but when it ran out of diesel, no-one on site knew how to restart it and the club chairman had to be got out of bed to fix it. Crawley and Reigate's big, reliable, diesel, intended to power their big 70cm linear, worked perfectly – at least for the first 40 minutes! It's always strange how something normally so reliable will fail at the drop of a hat in Field Day.

Overall, propagation conditions and activity levels appeared significantly better than in 2004, and **Table 1** shows how this is reflected in the actual numbers of points scored and QSOs made by leading entrants on each band.

Table 1

Points and QSO totals for leading stations in 2005 compared to 2004

Band	Max points change	Max QSOs change
50	Up 270%	Up 50%
70	Less than 1%	Up 8%
144	Up 39%	Up 21%
432	Up 34%	Up 21%
1,296	Up 62%	Up 45%

PHOTO: BERNIE MAGGS, 2E0BJM

Compared with 2004, the overall level of entries also showed some increase. Thanks to growth in numbers and migration from other sections, the Restricted gained most in entries, increasing by 50%. As usual, there were a few no shows from pre-registered stations and a few entries from non-pre-registered stations. There were also a number of UK portable stations active who, for some reason, did not submit an entry – if you were one, do think about entering next year. A number of UK and overseas stations submitted check logs. These were much appreciated by the adjudicators.

6 METRES

This band exhibited lengthy periods of both Tropo and Sporadic E propagation. Good DX into the Balkans, Romania, Greece and Israel was worked by many stations. Best DX was achieved by Edgware from IO91 with TT8 (Chad) at a distance of 4,559km. South Birmingham found activity to be the best for some years. Maidenhead, operating beside the road from a car, remarked at the good DX offered by the Sporadic E opening. MIDCARS, however, suffered from reverse TVI rendering many QSOs impossible for much of the time, with TV timebase swamping incoming signals.

4 METRES

In spite of the Sporadic-E on 6m on the Saturday, on Sunday 4m contacts proved to be restricted to the UK – although S51DI (Slovenia) was reported by Lothians as a "gotaway." Best DX was achieved jointly from IO91 with GM3TAL/P

From left:
The Newbury & District Amateur Radio Society (NADARS) team on top of Walbury Hill in West Berkshire with the sun setting in the West.

The Crawley & Reigate club's 2m systems

The Lothians RS 2m array after an extra strong gust (note the 6m yagi bowing in the wind as well)

at a distance of 638km. Cockenzie & Port Seton welcomed the extra points they gained from FM contacts. It is always worth taking a look on FM – especially if your PA can take the duty cycle! Fort William summed things up with one word, "Grim", and Goole found it a "steady slog". Mid-Lanark, on the other hand, had great fun and found conditions to be excellent. Likewise, the North Beds Gentlemen found, at their oasis, that conditions and activity levels were "generally good".

2 METRES

There was some good tropo – most notably to Spain – but many stations also reported ripples of lift to the east and south east of Europe accompanied by deep QSB. EA1FDI/P appears in many logs as best DX. So did a few other mainland Spain stations: EB1EB/P, EA2DR/1, EB1EWE/P. Even better DX, twice as far, was achieved with the Canary Islands in the shape of EA8/DL6FAW by Bracknell & Flight Refuelling from IO80 (2,769km) in the Open section and Newbury from IO91 (2,858km) in the Restricted section. Topping the lot was Warrington from IO93 in the Low Power section with EA8BPX at 2,994km. More remarkably, a couple of CT3 stations on the band were worked from the UK. It's unusual and exciting when there is more than one African country to be worked on 2m in a weekend!

70 CENTIMETRES

Many stations reported good conditions and activity – comparable with 2m – and EA1FDI/P appeared again as best DX in many logs. Beam headings seemed puzzling at times, with Spanish stations not peaking in any particular direction – but being very loud. Ripples of lift in the sector north east to south east provided enough of a stimulus to keep the eyelids from total closure during the night hours. Top distance goes to Lothians from IO74 (1,377km) in the Open section with (no guesses here) EA1FDI/P. They just pipped Cockenzie & Port Seton from IO74 (1,373km) in the same section. Close followers were Goole from IO93 (1,367km) in the Low Power section and De Montfort University from JO02 (1,350km) in the Restricted section. It would be interesting to see the log at EA1FDI/P and just how many points/QSOs they averaged! Unfortunately no-one managed to snag the EA8 guys on this band!

23 CENTIMETRES

With the odd exception, conditions were reported as moderate to good. However, activity was another thing and several bemoaned its low level, although entry levels are about the same as last year. Two Counties, from IO82, noted a slow start with some DX later. South Birmingham, also from IO82, thought that activity was up and were pleased with their two contacts with Spain. Both Colchester and Windmill in the Open section from JO01 bagged many contacts and moderate DX, but Surrey, in the bottom left hand corner of IO91, thought conditions poor. As usual, this is a band where your experiences can be markedly different from those of your neighbour. Best DX goes to Warrington (as well as on 2m) in the Low Power section with EA1BLA (1,168km). Just behind, was South Birmingham in the Restricted section – also with EA1BLA (1,091km).

LOGGING ACCURACY

As usual, logging standards varied enormously between groups, and if your team lost a lot of points, then next year it would help enormously to take just that little bit more care when logging. If you're not 100% sure that you copied the information correctly – ask for a repeat. It's much better to do that than to lose the QSO due to an error bring detected. Just to point out how important logging accuracy can be – even at the top of the tables where entrants are normally very accurate and only lose 2-3% of their score – the Open section overall winner was decided purely on logging accuracy this year. With both the claimed scores and the final result as close as any of us can remember, the Colchester Contest Group eventually triumphed over The Windmill Contest Group by only 0.2% in overall score to retain the Surrey Trophy, despite the fact that their initial claimed score was slightly smaller. Both entries were checked with immense precision to ensure that the final result reflected the actual performance of the teams on the day. Once again third place in the Open section was taken by an excellent entry from Scotland, this year from the Cockenzie & Port Seton ARC, who win the Tartan Trophy. They celebrated at the end of the contest with a little Clay Pidgeon shooting and hit seven clays from the team of seven people – clearly a lucky weekend for them.

Making it three years on the trot, the De Montfort University RS won the Restricted section and the Martlesham Trophy, with the South Birmingham Club narrowly beating the Reading team to take the runner-up position. Despite operating for only four hours, the two-man team of David Dodds, GM4WLL, and Jim Martin, MM0BQI, take the Cockenzie Quaich as the leading Scottish team in the section.

The Low Power section was won by another two man team – G8XVJ and G0CDA operating as the Warrington Contest Group – with Cambridge & DARC taking the runner-up position. The Scottish trophy goes to the three-man team of GM3TAL, G3SHK and G3RWF.

Finally, the positions in the Mix & Match section were also a repeat of last year, with Telford & DARS winning and taking the G5BY trophy and the Surrey Radio Contact Club just behind.

Congratulations to all of the trophy winners. You will also receive certificates, as will the leading stations in each UK DXCC country. ♦

Results on page 28 ▶

CONTEST RESULTS

Open Section

Pos	Group Name	Locator	50	70	144	432	1296	Total
1*	Colchester RA	01PU	587	368	834	912	1000	3333
2*	Windmill CG	01LD	640	0	995	1000	692	3327
3*	Cockenzie & Port Seton ARC	84BT	1000	1000	427	283	0	2710
4	Crawley ARC & Reigate ATS	010C	673	0	1000	531	443	2647
5	Bracknell ARC & Flight Refuelling ARS	80ST	612	654	685	421	135	2373
6	Lothians RS	74WV	472	955	273	247	0	1946
7	MIDCARS	83QE	113	322	306	0	43	784
8	Guildford & DRS	91TF	49	496	114	0	0	660
9	Aberdeen VHF Group	86RW	0	0	659	0	0	659
10	Newquay & DARS	70LK	474	0	70	65	0	609
11	Swindon & DARC	91CL	112	147	270	47	0	575
12	Edgeware & DARS	91VO	280	0	134	0	0	414
13	Adrian Denning	80LV	0	0	237	28	0	265

Low Power Section

Pos	Group Name	Locator	50	70	144	432	1296	Total
1*	Warrington CG	93AD	0	0	1000	1000	1000	3000
2*	Cambridge & DARC	02CE	1000	548	512	0	0	2060
3	Goole ARS 'A' Team	93PW	646	637	0	488	0	1772
4	Two Counties CG 'A'	92LJ	516	0	0	860	307	1684
5	Mid Sussex ARS	90WV	278	0	321	569	0	1168
6*	GM3TAL, G3SHK & G3RWF	75IU	0	1000	81	25	0	1105
7	Maidenhead & DARC	91OO	482	527	0	0	0	1009
8	Sutton Coldfield RS	92FM	369	0	316	197	0	882
9	Goole ARS 'B' Team	93PW	0	0	278	136	252	666
10	John Flowers	81TL	0	382	0	0	0	382
11	Darenth Valley RS	01CJ	0	0	288	0	0	288
12	Two Counties CG 'B'	92LJ	0	285	0	0	0	285
13	Les Allwood	91TE	0	8	0	106	0	114

Restricted Section

Pos	Group Name	Locator	50	70	144	432	1296	Total
1	De Montfort University ARS	02ST	780	0	979	1000	950	3709
2	South Birmingham RS	82XJ	740	628	0	895	1000	3262
3	Newbury & DARS	90WV	792	659	1000	0	775	3225
4	Lagan Valley ARS	74AI	1000	1000	487	238	0	2726
5	RADARS	83VP	880	632	415	0	0	1927
6	Basingstoke ARC	91KG	0	267	669	304	493	1734
7	North Beds Gentlemens' CG	92TI	299	363	369	358	0	1389
8	Cray Valley RS	01AH	544	0	560	270	0	1374
9	Salop ARS	82LQ	350	190	407	345	0	1292
10	GM4WLL & MM0BQI	85NR	968	0	47	106	0	1121
11	Mid Lanark ARS	85BN	560	51	272	28	0	911
12	West Bromwich Central RC (A)	92BX	290	227	64	72	0	653
13	Fort William Radio Group	75FI	415	43	163	30	0	651
14	Hitchin CG	92XA	470	0	0	0	0	470
15	MADARS & South Yorkshire ARS	93HO	0	0	152	107	0	259
16	Hucknall Rolls Royce ARC	93GC	22	0	132	22	54	230

Mix & Match Section

Pos	Group Name	Locator	50	70	144	432	1296	Total
1*	Telford & DARS	82NN	485	741	740	733	0	2700
2*	SRCC Contest Group	91XH	380	0	884	608	290	2162
3	Clifton ARS	01HH	799	343	374	234	0	1751
4	Shefford & DARS	92XA	0	659	335	230	438	1662
5	Sheffield ARC	93FK	449	0	314	462	343	1568
6	Thornton Cleveleys ARS	83NU	617	205	62	0	0	883
7	Wythall CG	92BJ	577	0	125	85	92	879
8	South Bristol ARC	81QJ	515	0	303	0	0	818
9*	Dundee ARC	86NN	249	30	3	26	0	309
10	TMARG CG & Verulam ARC	91QT	0	0	109	80	0	189
11	Sutherland & DARS	78VB	0	0	65	0	0	65

6m Open Section

Pos	Callsign	Loc	QSO	Score
1*	MM0CPS/P	IO84BT	223	214902
2*	G5LK/P	JO01OC	180	144658
3	G0FBB/P	JO01LD	191	137443
4	G4BRA/P	IO80ST	178	131585
5	G0VHF/P	JO01PU	182	126202
6	G3ZME/P	IO82NN	150	104328
7	G2KF/P	IO70LK	87	101810
8	GM3HAM/P	IO74WV	130	101344
9	G4FAL/P	IO93FK	140	96517
10	G3ASR/P	IO91VO	73	60110
11	G6ZTT/P	IO83QE	58	24312
12	G8SRC/P	IO91CL	46	24034
13	G5RS/P	IO91TF	24	10528

6m Restricted Section

Pos	Callsign	Loc	QSO	Score
1*	GI0RQK/P	IO74AI	119	114955
2*	MM0BQI/P	IO85RU	78	111255
3	G0ROC/P	IO83VP	144	101183
4	G5XV/P	IO91GI	156	91012
5	G3SDC/P	JO02ST	91	89637
6	G4OHM/P	IO82XJ	149	85015
7	G4ATH/P	IO83NU	69	70906
8	G0WRC/P	IO92BJ	84	66355
9	GM1XOI/P	IO85BN	51	64421
10	G3RCV/P	JO01AH	95	62586
11	G7FBD/P	IO81QJ	76	59246
12	G4OXD/P	IO92XA	92	53984
13	GM0FRG/P	IO75FI	37	47727
14	G3SRC/P	IO91XH	82	43716
15	MW0BAV/P	IO82LQ	52	40284
16	G4FEV/P	IO92TI	54	34414
17	G4WBC/P	IO92BX	38	33356
18	GM4AAF/P	IO86NN	17	28642
19	G4TSN/P	IO93GC	7	2509
20	GM1XOI/P	IO85BN	51	64421

6m Low Power Section

Pos	Callsign	Loc	QSO	Score
1*	G2XV/P	JO02CE	107	67030
2*	M0BPQ/P	JO01HH	76	53547
3	G0OLE/P	IO93PW	59	43308
4	G4APD/P	IO92LJ	45	34620
5	G3TWG/P	IO91PO	51	32332
6	G3RSC/P	IO92FM	44	24704
7	G5RV/P	IO90WV	32	18620

4m Open Section

Pos	Callsign	Loc	QSO	Score
1*	MM0CPS/P	IO84BT	85	21765
2*	GM3HAM/P	IO74WV	77	20777
3	G4RFR/P	IO80ST	83	14240
4	G3PJX/P	IO91TF	55	10797
5	G0VHF/P	JO01PU	39	8013
6	G4ZTT/P	IO83QE	51	7000
7	G8SRC/P	IO91CL	25	3203

4m Restricted Section

Pos	Callsign	Loc	QSO	Score
1*	GI0RQK/P	IO74AI	51	15946
2*	G3UKV/P	IO82NN	75	11815
3	G5XV/P	IO91GI	66	10501
4	G0ROC/P	IO83VP	63	10080
5	G4OHM/P	IO82XJ	70	10015
6	G4FOH/P	IO92TI	45	5790
7	M0BPQ/P	JO01HH	25	5472
8	G3TCR/P	IO91KG	30	4262
9	G4WBC/P	IO92BX	27	3623
10	G4ATH/P	IO83NU	20	3262
11	MW0BAV/P	IO82LQ	28	3025
12	GM3PXK/P	IO85BN	9	809
13	GM0FRG/P	IO75FI	6	687

4m Low Power Section

Pos	Callsign	Loc	QSO	Score
1*	GM3TAL/P	IO75IU	36	10902
2*	G3FJE/P	IO92XA	47	7186
3	G0OLE/P	IO93PW	36	6945
4	G2XV/P	JO02CE	35	5976
5	G3TWG/P	IO91OO	34	5745
6	G0JLF/P	IO81TL	25	4166
7	G4APD/P	IO92LJ	28	3105
8	GM4AAF/P	IO86NN	2	330
9	G3VQO/P	IO91TE	2	83

2m Open Section

Pos	Callsign	Loc	QSO	Score
1*	G5LK/P	JO01OC	699	260652
2*	G0FBB/P	JO01LD	650	259465
3	G0VHF/P	JO01PU	569	217325
4	G4RFR/P	IO80ST	473	178558
5	GM4ZUK/P	IO86RW	355	171650
6	MM0CPS/P	IO84BT	304	111363
7	M0BPQ/P	JO01HH	278	97535
8	G3ZTT/P	IO83QE	312	79793
9	GM3HAM/P	IO74WV	202	71124
10	G8SRC/P	IO91CL	241	70299
11	G4JBH/P	IO80LV	189	61746
12	G3ASR/P	IO91VO	125	35047
13	G1WAC/P	IO92BJ	149	32636
14	G6GS/P	IO91TF	139	29834
15	G3TDM/P	IO70LK	43	18249
16	GM4VVX/P	IO78VB	49	16830
17	G6GMW/P	IO83NU	82	16092

2m Restricted Section

Pos	Callsign	Loc	QSO	Score
1*	G5XV/P	IO91GI	377	115616
2*	G3SDC/P	JO02ST	317	113204
3	G3WIM/P	IO91XH	388	102198
4	G3ZME/P	IO82NN	304	85607
5	G3TCR/P	IO91KG	227	77377
6	G3RCV/P	JO01AH	273	64710
7	GI4GTY/P	IO74AI	153	56362
8	G0ROC/P	IO83VP	214	47948
9	GC3SRT/P	IO82LQ	153	47093
10	G4VMX/P	IO92TI	149	42648
11	G3FJE/P	IO92XA	152	38691
12	G3RCM/P	IO93FK	170	36322
13	GM1XOI/P	IO85BN	169	31414
14	GM0FRG/P	IO75FI	50	18807
15	G4BTS/P	IO93HO	68	17531
16	G5RR/P	IO93GC	59	15218
17	G4WBC/P	IO92BX	39	7436
18	GM4WLL/P	IO85RU	15	5414
19	GM4AAF/P	IO86NN	4	348

2m Low Power Section

Pos	Callsign	Loc	QSO	Score
1*	G3CKR/P	IO93AD	278	83829
2*	G8EVY/P	JO02CE	155	42933
3	G5RV/P	IO90WV	87	26919
4	G3RSC/P	IO92FM	102	26527
5	G4WAW/P	IO81QJ	98	25384
6	G0KDV/P	JO01CJ	107	24181
7	G0OLE/P	IO93PW	70	23327
8	M0TMR/P	IO91QT	54	9146
9	GM3SHK/P	IO75IU	14	6756

70cm Open Section

Pos	Callsign	Loc	QSO	Score
1	G0FBB/P	JO01LD	298	116416
2	G0VHF/P	JO01PU	264	106215
3	G5LK/P	JO01OC	171	61870
4	G4BRA/P	IO80ST	159	49044
5	MM0CPS/P	IO84BT	105	32897
6	GM3HAM/P	IO74WV	84	28745
7	G4OCO/P	IO70LK	18	7546
8	G8SRC/P	IO91CL	37	5416
9	G4JBH/P	IO80LV	6	3244

70cm Restricted Section

Pos	Callsign	Loc	QSO	Score
1	G3SDC/P	JO02ST	132	50385
2	G8OHM/P	IO82XJ	151	45088
3	G3ZME/P	IO82NN	134	36934
4	G3ZPB/P	IO91XH	134	30630
5	G8BNE/P	IO92TI	67	18028
6	GW8DIR/P	IO82LQ	71	17365
7	G3TCR/P	IO91KG	52	15299
8	G1RCV/P	JO01AH	76	13606
9	MI0BOT/P	IO74AI	39	11994
10	G3GHN/P	JO01HH	45	11810
11	G3FJE/P	IO92XA	52	11598
12	M0CKY/P	IO93HO	31	5403
13	GM4WLL/P	IO85RU	15	5353
14	G7WAC/P	IO92BJ	28	4262
15	G4WBC/P	IO92BX	19	3607
16	GM0FRG/P	IO75FI	4	1499
17	GM3PXK/P	IO85BN	10	1405
18	G3RR/P	IO93GC	9	1119

70cm Low Power Section

Pos	Callsign	Loc	QSO	Score
1	G3CKR/P	IO93AD	79	23220
2	G8LED/P	IO92LJ	82	19972
3	G5RV/P	IO90WV	43	13223
4	G0OLE/P	IO93PW	39	11340
5	G0HSA/P	IO93FK	49	10732
6	G3RSC/P	IO92FM	31	4566
7	G8VHL/P	IO93PW	13	3162
8	G3VQO/P	IO91TE	22	2467
9	G8VER/P	IO91QT	14	1850
10	GM3RWF/P	IO75IU	2	569
11	GM4AAF/P	IO86NN	1	612

23cm Open Section

Pos	Callsign	Loc	Score	QSO
1	G0VHF/P	JO01PU	146	50741
2	G0FBB/P	JO01LD	112	35117
3	G5LK/P	JO01OC	71	22468
4	G4RFR/P	IO80ST	30	6853
5	G8ZTT/P	IO83QE	18	2176

23cm Restricted Section

Pos	Callsign	Loc	QSO	Score
1	G3OHM/P	IO82XJ	65	16815
2	G3SDC/P	JO02ST	54	15973
3	G5XV/P	IO91GI	55	13025
4	G3TCR/P	IO91KG	34	8298
5	G7HRR/P	IO93GC	6	912

23cm Low Power Section

Pos	Callsign	Loc	QSO	Score
1	G3CKR/P	IO93AD	50	11134
2	G3FJE/P	IO92XA	23	4879
3	M0GAV/P	IO93FK	30	3818
4	G3BXF/P	IO92LJ	20	3419
5	G8MNY/P	IO91XH	26	3230
6	G0OLE/P	IO93PW	13	2802
7	G4WAC/P	IO92BJ	6	1026

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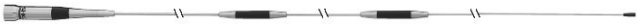

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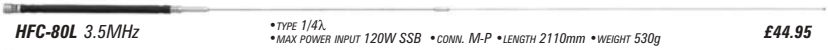

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70cm - 5.5dBi
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SQBM200 Mk.2 Dual Bander..... **£49.95**
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70cms	(Boom 12")	**£19.95**
2 metre	(Boom 20")	**£24.95**
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6/2/70 Triband	(Boom 45")	**£64.95**

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2 metre 5 Element
(Boom 64") (Gain 7.5dBd) **£89.95**
2 metre 8 Element
(Boom 126") (Gain 11.5dBd) **£109.95**
70 cms 13 Element
(Boom 83") (Gain 12.5dBd)..... **£79.95**

Yagi Beams (fittings stainless steel)

2 metre 4 Element
(Boom 48") (Gain 7dBd) **£29.95**
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(Boom 63") (Gain 10dBd) **£49.95**
2 metre 8 Element
(Boom 125") (Gain 12dBd) **£69.95**
2 metre 11 Element
(Boom 185") (Gain 13dBd)..... **£99.95**
4 metre 3 Element
(Boom 45") (Gain 8dBd)..... **£59.95**
4 metre 5 Element
(Boom 128") (Gain 10dBd)..... **£69.95**
6 metre 3 Element
(Boom 72") (Gain 7.5dBd)..... **£64.95**
6 metre 5 Element
(Boom 142") (Gain 9.5dBd)..... **£84.95**
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(Boom 76") (Gain 12.5dBd)..... **£49.95**

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The biggest advantage with a ZL-special is that you get massive gain for such a small boom length, making it our most popular beam antenna

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Convert your half size G5RV into a full size with just 8ft either side. Ideal for the small garden..... **£19.95**

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These heavy duty aluminium (1.8mm wall) have a lovely push fit finish to give a very strong mast set
1.25" set of four 5ft sections.....**£24.95**
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RG58 best quality standard per mt.....**35p**
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RGMini 8 best quality military spec per mt.....**70p**
RG213 best quality military spec per mt.....**85p**
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20 amp red/black cable 20 amp per mt.....**75p**
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Please phone for special 100 metre discounted price

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PL259/9 plug (Large entry).....**£0.75**
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N-Type plug (Large entry).....**£3.00**
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N-Type Chassis scoket (Round).....**£3.00**
N-Type Chassis scoket (Square).....**£3.00**
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N-Type Double female.....**£2.50**
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SO239 to N-Type adapter.....**£3.00**
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BNC to PL259 adapter (Female to male).....**£2.00**
BNC to N-Type adapter (Female to male).....**£3.00**
BNC to N-Type adapter (Male to female).....**£2.50**
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Please add just £2.00 P&P for connector only orders
PLEASE PHONE FOR LARGE CONNECTOR ORDER DISCOUNTS

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

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MD-24 HF or VHF/UHF internal duplexer (1.3-225MHz) (350-540MHz) SO239/PL259 fittings.....**£22.95**
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CS401 Same spec as CS201 but4-way.....**£39.95**

Antennas 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**
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RC26 Alignment Bearing for RC5-1/3.....**£49.95**

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All mounts come complete with 4m RG58 coax terminated in PL259 (different fittings available on request).
3.5" Pigmy magnetic 3/8 fitting.....**£7.95**
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5" Limpet magnetic SO239 fitting.....**£12.95**
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7" Turbo magnetic SO239 fitting.....**£14.95**
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RKIT-SO Aluminium SO rail mount to suit 1" roof bar or pole....**£14.95**

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Enamelled copper wire 16 gauge (50mtrs).....**£11.95**
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(Other lengths available, please phone for details)

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TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ Approx 20ft erect 6ft collapsed.....**£99.95**
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HF Yagi

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

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

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

HF Verticals

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

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

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

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

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

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(Hi grade heavy duty Commercial Antennas)

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MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts.....**£99.95**
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MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts.....**£89.95**
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30mtr RG58 PL259 to PL259 lead.....**£14.95**
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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)

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FREQ: 0-2000MHz LENGTH 100cm SOCKET SO239 £7.00 P&P
RADIALS: 3 x 17cm

SUPERSCAN STICK II (WIDEBAND) **£39.95**
FREQ: 0-2000MHz GAIN: 3.00dB OVER SSSI £7.00 P&P
LENGTH: 150cm SOCKET: SO239 RADIALS: 3 x 50cm
These two superb fibreglass external wideband antennas have capactor loaded trapped coils to give maximum sensitivity to even the weakest of signals. No wonder they are best selling verticles!

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FREQ: CIVIL & MILITARY AIR GAIN: 3.0/6.0dB £7.00 P&P
LENGTH: 100cm SOCKET: SO239 RADIALS: 3 x 17cm

AR-50 (AIR BAND) **£49.95**
FREQ: CIVIL & MILITARY AIR GAIN: 4.5/7.0dB £7.00 P&P
LENGTH: 150cm SOCKET: SO239 RADIALS: 3 x 50cm
These dedicated fibreglass external antennas are pre-tuned for both air band frequencies. Get the gain and don't miss take off!

X1-HF VERTICAL (DEDICATED HF) **£49.95**
FREQ:1-50MHz LENGTH: 200cm SOCKET: SO239 £7.00 P&P
RADIALS: NONE
This HF vertical antenna incorporates helical traps and is an ideal alternative to long wire.

Discone Base Antennas

STANDARD DISCONE (WIDEBAND) **£29.95**
FREQ: 25-1300MHz LENGTH 100cm SOCKET: SO239 £7.00 P&P
RADIALS: 16

SUPER DISCONE (WIDEBAND) **£39.95**
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LENGTH: 140cm SOCKET: SO239 RADIALS: 16

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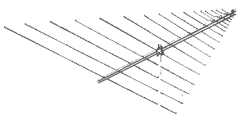
FREQ: 0.05-2000MHz LENGTH: 180cm SOCKET: SO239 £7.00 P&P
RADIALS: 16

ROYAL DISCONE 2000 (WIDEBAND – STAINLESS) **£49.95**
FREQ RX: 25-2000MHz FREQ TX: 50-52, 144-146, 430-440£7.00 P&P
900-986, 1240-1325MHz LENGTH: 155cm GAIN: 4.5dB OVER
STANDARD SOCKET: N TYPE RADIALS: 16

ROYAL DOUBLE DISCONE 2000 ..... **£59.95**
FREQ RX: 25-2000MHz FREQ TX: 130-175/410-475MHz £7.00 P&P
GAIN: 5.5dB LENGTH: 150cm SOCKET: N-TYPE
The discone has been around for over 40 years and is generally recognized as the original and probably the best all round scanner antenna. Choose the best one for your station or call us for advice.

Beam Antennas



MLP-32 (LOG PERIODIC) **£119.95**
FREQ: 100-1300MHz TX & RX..... £7.00 P&P
GAIN: 11-13dB LENGTH 140cm
SOCKET: N TYPE

MLP-62 (LOG PERIODIC) **£189.95**
FREQ: 50-1300MHz TX & RX..... £7.00 P&P
GAIN: 10-12dB LENGTH: 200cm
SOCKET: N TYPE
These two beam antennas are sold mainly to our military & commercial customers. With an SWR 2:1 or better over the whole frequency, for performance it just doesn't get better.

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£7.00 P&P

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G.SCAN II MOBILE (WIDEBAND) **£29.95**
TYPE: TWIN COIL FREQ: 25-2000MHz £7.00 P&P
LENGTH: 65cm BASE MAGNETIC CABLE: 4m
WITH BNC

SKYSCAN MOBILE (WIDEBAND) **£19.95**
TYPE: 4 TUNED WHIPS FREQ: 25-2500MHz £7.00 P&P
LENGTH: 65cm BASE MAGNETIC CABLE: 4m
WITH BNC
Don't loose those signals while on the move. Get high performance reception wherever whenever.

Portable Antennas

SKYSCAN DESKTOP (INTERNAL/WIDEBAND) **£49.95**
TYPE: DISCONE STYLE FREQ: 25-2000MHz £7.00 P&P
LENGTH: 90cm CABLE: 4m WITH BNC

TRI-SCAN III DESKTOP (INTERNAL/WIDEBAND) **£39.95**
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Open to all

The RSGB HF Convention in October provided plenty of activities for newcomers, reports Steve Hartley.

The RSGB HF Convention (HFC) is one of the most prestigious events in the UK amateur radio calendar. Last year there was a major push to open up the convention to newcomers. All three levels of radio communications examination were held and a number of talks were specifically aimed at those who were either new to amateur radio or new to HF operating.

Following on from the success of the 2004 event, this year's convention sought to go one better. The three UK examinations were offered again but this time attendees had the opportunity to sit the American exams too.

NEWCOMERS LECTURES

This year's HFC had two talks intended as beginners' guides. The first was *Starting out in DXpeditioning* by Ian Greenshields, G4FSU. For those who are not familiar with the term, DXpeditioning involves operating a station from a different part of the world, usually somewhere that does not have many, or in some cases any, resident radio amateurs. That means the location is attractive to those looking to increase their total of countries/islands worked.

Ian explained that he had attended HFC a few years ago and was quite taken aback by the size and complexity of some DXpeditions. He decided to give it a go, but on a much smaller scale, what he calls a "one man, one week, one case" DXpedition. His talk covered the locations he has been to, the equipment he takes and some background on the logistics involved in gaining foreign licences in Africa.

Ian was clearly very enthusiastic about his achievements and I am sure a number of the newcomers present would have been inspired to give DXpeditioning a go.

I presented a talk at the convention entitled *A newcomers guide to building HF transceivers.* I have to confess that this was a blatant, but hopefully informative, advertisement for my forthcoming book on the subject. The talk covered construction techniques, what equipment is needed, some ideas for receivers and transmitters, and how to link them to form transceivers. I hope to have the book in the RSGB Bookshop early next year.

It was great to see so many readers attending my talk. Don't forget to let me know how you get on with your building, or if you follow Ian's lead and try DXpeditioning for the first time.

Advanced examination candidates at the HF Convention with Alan Betts, G0HIQ, and Steve Hartley, G0FUW, standing at the back (see UK Examinations)

UK EXAMINATIONS

Brian Reay, G8OSN, is chairman of the RSGB's Amateur Radio Development Committee. Together with Alan Betts, G0HIQ, Ed Taylor, G3SQX, and Dave Wilson, M0OBW, Brian arranged for around a dozen candidates to take and pass the Foundation and Intermediate exams on the Saturday of the convention.

On the Sunday, another 11 sat the Advanced exam but as I am sure readers are aware, marking of these papers takes longer than those for the Foundation and Intermediate exams.

A number of candidates took two of the exams over the weekend and one took all three. Congratulations to all those who were successful and I trust the Advanced results bring good news in due course.

OLD CERTIFICATES

Whilst we were getting ready for the UK exams, Peter Burt came and asked me for some advice. It struck me that his question might be relevant to other readers and Peter said he had no objections to me sharing it through the column.

Peter was clutching some old City & Guilds documents. They stated quite clearly that he had passed the Radio Amateur Examination in December 1989. He explained that he had never got round to taking out a licence and his key question was: Are old City & Guilds certificates still valid? The answer is: yes, they are, and there is no requirement to sit the new style exams if you can prove that you passed the old one. Peter was pointed to the Radio Licensing Centre website (see Websearch below) to obtain an application form and hopefully has his callsign by now. Let us know how you find life on the air Peter. Was it worth the wait?

AMERICAN EXAMS

This year Paul Steed, G0VEP (aka N3SSH), arranged for the American amateur radio examinations to be offered at the HFC. I popped in to see how these compared to the UK exams. Paul explained that the exams are arranged on an 'on demand' basis to the point that two candidates turned up then and there and asked to do the exam. Papers are randomly generated from a published question database, the candidates answer the questions and they are marked on the spot.

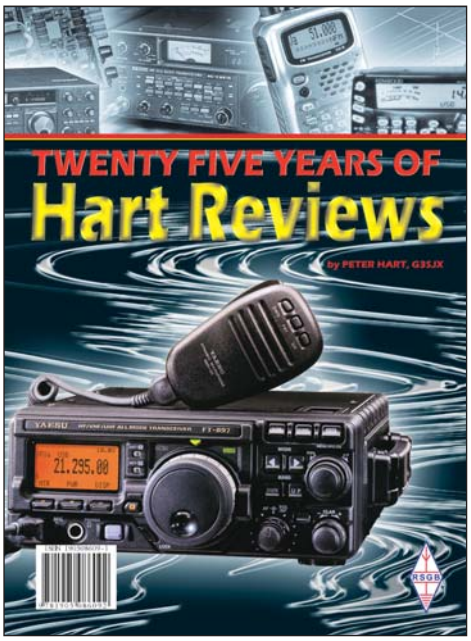
While I was in attendance, six candidates were at different stages of working through the Technician, General and Extra papers. I was very impressed by the whole set-up and look forward to the day that we have enough questions in the UK bank to be able to do something similar.

If anyone is interested in sitting the American examinations, Paul and his wife Betty are happy to answer any questions you might have. They can be contacted via e-mail on g0vep@ntlworld.com or by telephone on 023 9237 1677.

SAME AGAIN?

Based on what I saw and heard, I believe that the HFC organisers will be keen to repeat the newcomers' features again next year. If you missed out, make a note to visit the next HFC in your 2006 diary. ♦

WEB SEARCH	
Radio Licensing Centre	www.radiolicencecentre.co.uk/rlc/



25 YEARS OF HART REVIEWS
by Peter Hart, G3SJX
Reviewed by RSGB Staff

This book is a real gem. When I first picked it up and scanned through the pages, I thought "This is a book everyone should have. It contains everything I need to know about radios, past and present." Not only is it a compilation of all Peter Hart's reviews since 1981, but it is an historical record of the good and the not-so-good over the last 25 years.

It stirs your memory. Can *you* remember the NEC CQ-R700 HF receiver? It precedes those with digital readout, and was the first piece of equipment reviewed in 1981. You flick through the pages – "I used to have one of those," then more, "Fred down the road had this one – it was very good," further still, "I remember that. It was *awful*". The memories come flooding back. Amongst these, of course, are the milestones of amateur radio – those transceivers that *everyone* remembers. Everything that has been tested is here; the good, the bad and the indifferent – all with their measured performances.

What you can do now, of course, is directly to compare the different pieces of equipment; you can see how the performances have changed over the years. We can all remember the ticking noise we heard when tuning close to strong stations; synthesiser noise problems have come and gone, and you will find the transceivers that suffered from them and those that didn't. They are all here – documented history. Don't forget to look at the suppliers of equipment for Peter's reviews. There are some names there you will have forgotten, too!

The book begins with a very detailed discussion of how Peter actually performs the tests, what they are, what pitfalls there are in the procedures, and what the results tell us. He describes the test equipment he uses and how it is all connected together. If you think it is all just a matter of connecting the bits and pieces with coax, think again! Everything is delightfully simple in theory but, as always, the practice is quite different.

Peter gives block diagrams of his setup for each type of measurement, and there are plenty of tables of data, including a ranking of most modern transceivers by their close-in dynamic ranges. This first section of the book alone is worth separate publication. Too many people dismiss measurements as being trivial. This should help to set the record straight.

Harking back to the nostalgia elements, it can be quite an eye-opener to compare the performance of that 1990 transceiver you thought was so good, with an equivalent piece of equipment today. You will then appreciate just how far radio technology (or at least the implementation of radio technology in amateur radio equipment) has advanced, and what you get for your money these days.

The book covers *all* Peter's reviews over the past 25 years, and this includes antennas, receivers, linears, transverters and receive converters.

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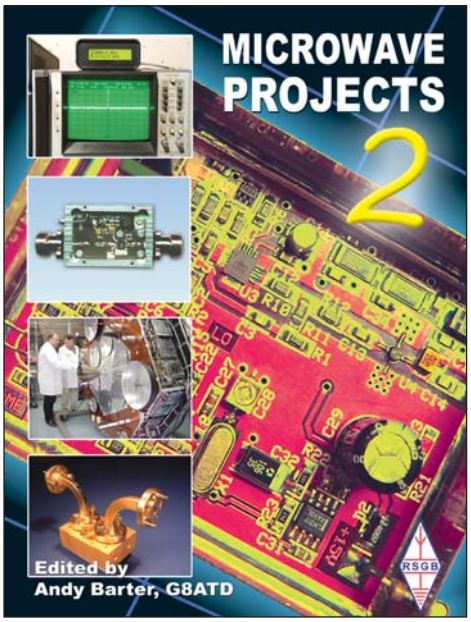
Book review



MICROWAVE PROJECTS 2
Edited by Andy Barter, G8ATD
Reviewed by RSGB Staff

This is a follow-up to the 2003 book *Microwave Projects*, by the same editor, and is a collection of some 27 designs for the microwave devotee.

As the editor mentions in his Preface, being the publisher of *VHF Communications* has enabled him to have access to many designs and articles. Look out for the article from our own 'Microwave' columnist, Sam Jewell, G4DDK.

To address the problem of 'getting the equipment working', Andy has included several articles which go into more detail than is usual about the design.

The book is divided into five chapters -

- Transverters and transmitters, including two new transverter designs for 23cm and 13cm plus an ATV transmitter for 3cm.
- Receive amplifiers, including preamplifiers for 23cm, 13cm, 6cm and 3cm.
- Power amplifiers, including a detailed design for a valve amplifier for 23cm plus solid-state amplifiers for 23cm, 6cm, 3cm, 24GHz and 76GHz.
- Filters, including detailed design techniques for coaxial and stripline low-pass filters.
- Miscellaneous, which includes rare articles on using YIG oscillators and microwave absorbers.

Anyone with the knowledge to tackle any of these designs will know broadly what to expect. Looking through the book in detail produces three outstanding features: the number of articles supplied by Patrick Fouqueau, F1JGP; an almost-40-page article by John Fielding, ZS5JF, on a 23cm power amplifier using two GI7BT valves; a 25-page article by Gunthard Kraus, DG8GB, on the design and realisation of stripline low-pass filters.

A comprehensive index is provided – too comprehensive, some might say, judging by the appearance of words such as 'frequency', 'high', 'microwave', etc with dozens of entries! Some of the authors are listed in the index, but not all, which caused me a few problems when looking for an article whose author I remembered, but not the title.

Yes, it is a good book, and will have the microwavers queuing for their copies. Don't be left out!

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Goldline Vintage Stick mic	£129.95
HM-10-4 HC4 Reg stick mic	£69.95
HM-10-5 HC5 Reg stick mic	£69.95
HM-Dual HC4+5 Stick mic	£119.95
HM-10-I Icom Stick mic	£89.95
HMM-1C Icom Hand Mic	£59.95
HMM-K HC4/5 Ken hand mic	£74.95
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Traveller-817 Yaesu headset	£79.95
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Call for Leads and Accessories

Adonis Microphones

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Variable Compression
2 Microphone Outputs
£129.95

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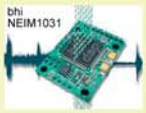
bhi DSP



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NES10-2 Speaker with dsp	£89.95
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NES1061 817 brd inc fitting	£115.95
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NEW

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Will tune AR-8200, AR8000 & IC-R10
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£99.95

FC130	£79.95
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* 10Hz-3GHz
* Imp - 50 Ohms
* LCD readout
* 10-Digit display

Super Hunter
£149.95

Daiwa Accessories

Cross-needle meters

CN101L HF/VHF	£59.95
CN103N VHF/UHF	£65.95
CN801H HF/VHF	£109.95
CN801V VHF/UHF	£119.95

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

Avair Meters

AV-200
HF / VHF PWR SWR meter

AV-201 HF/VHF	£49.95
AV-401 VHF/UHF	£49.95
AV-601 HF/VHF/UHF	£69.95
AV-1000 HF/VHF/UHF	£89.95
AV-20 HF/VHF	£29.95
AV-40 VHF/UHF	£29.95

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Palstar ZM30 - Antenna Analyser
Micro-controlled SWR antenna analyzer ***£289.00***

Watson Antennas

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

W-30 2/70 Base	£39.95
W-50 2/70 Base	£49.95
W-300 2/70 Base	£64.95
W-2000 6/2/70 Base	£69.95
WBV-70 4m 1/2 Wave Base	£39.95

Bencher Antennas

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

Butternut HF-2V 40/80m	£229.95
Butternut HF-6V 80-10m	£299.95
Butternut HF-9V 80-6m	£349.95
Butternut HF-5B 20-10m	£319.95
30-MRK 30m ad for HF2V	£89.95
A-17-12 17&12 ad for HF6V	£49.95
A-6 6m ad for HF6V-X	£14.95
TBR-160S 160m HF2/6/9V	£114.95

Hustler Antennas

Hustler 5-BTV
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
£189.95

Hustler 4-BTV 4 Band Vert	£159.95
Hustler 6-BTV 6 Band Vert	£209.95

West Mountain Radio

RIGblaster Pro	£209.95
RIGblaster Plus	£119.95
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RIGblaster M4	£89.95
RIGblaster RJ	£89.95
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Nomic 4P	£59.95
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Tonna - 20655
23cms (1296 Mhz) 55 element 21.5 dbi gain "N" 4.64m long.

Tonna 20505 6m 5el	£89.95
Tonna 20809 2m 9el	£54.95
Tonna 20811 2m 11el	£79.95
Tonna 20817 2m 17el	£99.95
Tonna 20909 70cm 9el	£45.95
Tonna 20919 70cm 19el	£59.95
Tonna 20921 70cm 21el	£74.95
Tonna 20635 23cm 35el	£64.95
Tonna 20655 23cm 55el	£89.95
Tonna 20745 13cm 25el	£69.95

Diamond Antennas

HF10FX 10m Mobile	£39.95
HF15FX 15m Mobile	£39.95
HF20FX 20m Mobile	£39.95
HF40FX 40m Mobile	£39.95
HF80FX 80m Mobile	£42.95
CR8900 10/6/2/70	£72.95
CP6 Base 6m-80m	£239.95
X50 Base 2/70	£54.95
X200 Base 2/70	£84.95
X300 Base 2/70	£99.95
X510 Base 2/70	£124.95
X700 Base 2/70	£249.95

Cushcraft Antennas

X-7 - 20/15/10 7el Yagi	£669.95
A3S - 20/15/10 3el Yagi	£499.95
A4S - 20/15/10 Yagi	£569.95
A3WS - 12/17 3el Yagi	£379.95
ASL-2010 13-32MHz Log	£749.95
MA5B - Mini Beam	£369.95
D3 - 20/15/10 Dipole	£249.95
D3W - 30/17/12 Dipole	£249.95
D4 - 40m Rotary Dipole	£349.95

TGM Antennas *Mini Beams*

** Call for prices on TGM upgrade kits.*

MQ-24SR 6-20m 2el	£329.95
MQ-34SR 6-20m 3el	£449.95
MQ-3 6-20m 3el	£379.95
MQ-26 6-20m 2el	£389.95
MQ-26SR 6-20m 2el + EH	£419.95
MQ-36SR 6-20m + Dir	£559.95

Radioworks Wire Ants

CW-160 160-10m (252ft)	£129.95
CWS-160 160-10m (133ft)	£114.95
CW-80 80-10m (133ft)	£89.95
CWS-80 80-10m (66ft)	£109.95
CW-40 40-10m (66ft)	£84.95
CW-20 20-10m (34ft)	£89.95
G5RV+ 80-10m	£59.95
Radioworld G5RV Fullsize	£29.95
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LDG Electronics

AT-1000

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

£449.95

LDG Z-100

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

£115.00 ***BEST SELLER****

LDG TW-1 TALKING WATTMETER *New*

Speaks Fwd - Rev power in Watts & SWR
Continuous tone for amplifier adjustments
Power range: 0 – 2000 watts PEP

£109.00

LDG AT-100Pro *New*

100w Auto ATU - 1.8-54MHz
1-5 seconds Tune - 2 Pos Ant switch

£169.95 ***New****

LDG RBA 1:1 & 4:1

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

£29.95

LDG AT-897

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

£199.95

Accessories:

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

W4RT Electronics

One-Plug-Power

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

OPP-817 £54.95

NEW! 2300 mAh Large Capacity FT-817 Internal Battery Soluion Still use Internal 817 Charger

OPP-897 £89.95

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

NEW!

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One-Big Punch

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

OBP £49.95

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

MAX PUNCH £165.95

You can also enjoy the "MAX PUNCH" option that features the HC-4 with the OBP and the HC-5 (w/o OBP). The TONE switch is used to select which element is operational.

HAND MIKE £57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

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

One-Board-Filter

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

OBF £229.95

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

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

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

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

One-Touch-Tune

At the touch of a button, you have the carrier needed for tuning. One-Touch Tune (OTT) is totally transparent to the FT-817 and to any external equipment that you have attached to the rig.

OTT-817 £54.95

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

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W4RT OTT-FT847	£54.95
W4RT FT817 One Fast Charger	£Call
W4RT Antenna Boss	£139.95

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£229.95

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£299.95

iBox is a versatile accessory for amateurs who are serious about their audio.

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ATX Walk--about PL-259

£47.95

The ATX Walkabout covers all bands (including WARC bands) from 80-6m, 5W guaranteed, 25W max. When fully telescoped it is about 65 inches long. This makes it ideal for the FT-817 or any other portable HF radio.

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ATX Walkabout PL259	£47.95
ATX Walkabout Universal	£54.95

The Miracle Whip

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

Power Limits 25W PEP 10W Cont.

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* The Miracle Whip will transmit on almost any frequency you are licensed to use including WARC, MARS/CAP, Alaska Emergency, Citizens Band, Marine, and most commercial HF SSB and VHF/UHF channels

** The Miracle Whip is optimized for for best receive rather than lowest swr on 80 and 160, as no short antenna will present good transmitting opportunities at these frequencies

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£39.95

An extremely strong magnet base which actually consists of 3 x 5" chrome magnets that are interconnected with metal strips to form one very large mount. Suitable for very large mobile antennae such as ¼ wave tank whips.

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HF - 1.5-30MHz
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MFJ-722 CW / SSB Filter SH MFJ 722 £59.00
MFJ-784 DSP Filter SH MFJ-784 £149.00
MFJ-9015 15m cw Trx SH MFJ 9015 £84.26
MFJ-912 Remote Balun SH MFJ-912 £20.00
MFJ-914 SH MFJ-914 £39.95
MFJ-921 VHF 200 Watt ATU SH MFJ 921 £50.00
MFJ-931 Artificial Ground SH MFJ931 £69.00
MFJ-948 ATU SH mfj948 £89.00
MFJ-949E Versa Tuner SH MFJ-949E2 £109.00
MFJ-962D Versa Tuner SH MFJ-962D £220.00
Microset PC2S 30 Power Supply SH PC2S 30 £99.00
Microset PT 135 PSU SH PT 135 £120.00
Microset R50 2m Amp SH R50 £79.00
Mizuho ATU SH MIZ ATU £40.00
MML432-30L SH MML432/30 £89.00
MML432-50 70cm's Linear Amplifier SH MML432/50 £79.00
OptoElectronics X Sweeper SH XSWEEP £1199.00
Palstar PS-30N PSU SH PS 30N £79.00
Pro.Sis.Tel Rotator and Head Unit SH PST £289.00
Proset-Plus SH-PROSET-PL £109.00
Realistic Pro-2006 Scanner SH Pro-2006 £129.00
Realistic Pro-2012 SH PRO-2021 £79.00
Realistic Pro-26 Scanner SH Pro-26 £89.00
Rexon RL-501 Dual Band Handy SH RL-501 £89.00
SMC 150PL Dummy Load SH 150-PL £29.00
Snooper S5-R Safety Alert System SH S5-R £119.95
Standard C-156E 2m Handheld SH C-156E £125.00
Standard C468 70cm Handy SH C468 £59.00
Target HF3 HF3 RX SH HF3 £99.00
Tentec Paragon HF Base Inc. Speaker SH TT PARA £700.00
TenTec RX-350 HF Receiver SH TT RX 350 £799.00
Timewave DSP-59+ Filter SH DSP 59+ £129.00
Timewave PK-12 Packet SH PK12 £99.00
Tokyo Hy-Power HT-106 6m Transceiver SH HT-106 £199.00
Tono Theta 777 TNC SH 777 £49.00
Trio (Kenwood) YK-88C IF Filter SH YK-88C £40.00
Vibroplex Vibro Keyer Deluxe SH VB-DK £119.00
Watson W-25SM 22A Power Supply SH W-25SM £59.00
WELZ DL-600 Dummy Load SH DL-600 £49.00
Yaesu FC-20 ATU for FT-847 SH FC-20 £175.00
Yaesu FL-2025 25W Linear Amplifier SH FL2025 £99.00
Yaesu FP-707 PSU SH FP-707 £110.00
Yaesu FR-101 HF RX SH FR-101 £399.00
Yaesu FRG-100 HF Receiver SH FRG-100 £299.00
Yaesu FRG-7 HF Receiver SH FRG-7 £99.00
Yaesu FRG-7700 HF Receiver SH FRG7700 £199.00
Yaesu FRG-9600 VHF-UHF Receiver SH FRG9600 £199.00
Yaesu FRT-7700 SH FRT 7700 £70.00
Yaesu FRT7700 Antenna Tuner SH FRT7700 £69.00
Yaesu FRV-7700 Converter FRG-7700 SH FRV 7700 £60.00
Yaesu FRV7700 Converter SH FRV7700 £60.00
Yaesu FT-1000 "CLASSIC" HF Trx SH FT-1000 £1399.00
Yaesu FT-1000MK V 200w SH FT-1000Mk £1499.00
Yaesu FT-1000MP AC HF Base SH FT-1000MP £1199.00
Yaesu FT-1000MP Mark -V Field SH FT-1000Mk £1349.00
Yaesu FT-101ZDmk3 HF Transceiver SH FT-101ZD3 £325.00
Yaesu FT-2800M 2m Transceiver SH FT2800M £119.00
Yaesu FT-290MkII 2m Multi-mode Trx SH FT-290MK2 £250.00
Yaesu FT-416 2m Handy SH FT-416 £79.00
Yaesu FT-41R Handheld Transceiver SH FT 41R £120.00
Yaesu FT-470R Dual Band Handheld SH FT 470R £129.00
Yaesu FT-51R Dual Band Handy sh FT51R £149.00
Yaesu FT-690Rmk2 6m Multi mode SH FT 690 MK £275.00
Yaesu FT-707 HF Transceiver SH FT-707 £220.00
Yaesu FT-7100M Dual Band Mobile Trx SH FT7100M £159.00
Yaesu FT-736R 23cms Module SH FEX-736 1 £399.00
Yaesu FT-736R 2m/70cm Base mode SH FT736R5 £499.00
Yaesu FT-736R 6m, 2m & 70cm Base SH FT736Ra £699.00
Yaesu FT-736R 2/70 +6m+23cms SH FT-736R £899.00
Yaesu FT-747 HF Trx SH FT 747 £299.00
Yaesu FT-767GX HF, 6m & 2m trx SH FT767GX £599.00
Yaesu FT-76R 70 cms Handheld Transceiver SH FT 76 £99.00
Yaesu FT-7800 2/70 mobile SH FT 7800 £199.00
Yaesu FT-817 Portable Transceiver SH Yae 817 £375.00
Yaesu FT-847 Multi-Band Transceiver SH FT-847 £849.00
Yaesu FT-857D Multi-band Mobile SH FT-857D1 £499.00
Yaesu FT-8900 Quad Band Mobile Trx SH FT-8900 £279.00
Yaesu FT-897 Multiband Portable Trx SH FT-897 £539.00
Yaesu FT-900AT HF Transceiver SH FT900AT £549.00
Yaesu FT-902DM HF transceiver SH FT-902DM £325.00
Yaesu FT-920AF HF / 6M Base SH FT 920 £899.00
Yaesu FT-990 /AC SH FT-990 £899.00
Yaesu FT857 Multiband Mobile SH FT857 £425.00
Yaesu FTV-901R 2m / 6m Transvertor SH FTV901R £275.00
Yaesu FV-901DM VFO SH FV901DM £175.00
Yaesu MD-1 Desktop Microphone SH MD-1 £75.00
Yaesu MH-29 Speaker Microphone SH MH-29 £49.00
Yaesu MMB-31 Mobile Mounting Bracket SH MMB-31 £15.00
Yaesu MW-1 Remote Control Mic SH MW1 £60.00
Yaesu NC70 Battery Charger SH NC70 £60.00
Yaesu PA-11C SH PA-11C £20.00
Yaesu VR-5000 Receiver SG VR5000 £389.00
Yaesu VX-110 2m Handy SH VX-110 £79.00
Yaesu VX-1R Handie SH VX1 £89.00
Yaesu VX-2E Dual Band Handy SH VX-2E £99.00
Yaesu VX-5R Tri-Band Handy SH VX-5R £149.00
Yaesu VX-7R Tri Band Handy SH VX7R £169.00
Yaesu VX-7R Tri Band Handy SH VX7RS £169.00
Yaesu XF-10 9M-202-01 Filter SH XF109 £30.00
Yaesu XF-455K-251-01 CW filter SH XF455 £30.00
Yupiteru MVT-225 SH MVT-225 £149.00
Yupiteru MVT-3300EU Scanner SH MVT-3300 £99.00
Yupiteru MVT-7100 SH MVT 7100 £140.00
Yupiteru MVT-7100 Scanner SH MVT7100 £149.00
Yupiteru MVT-7300 Scanner SH MVT-7300 £179.00
Yupiteru MVT-9000 MK2 Scanner SH MVT-90002 £249.00
Yupiteru MVT-9000 Scanner SH MVT-9000 £199.00

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E-mail: tim@g4vxe.com

Hard of hearing

Don't assume that just because you can hear a station, it can hear you, advises Tim Kirby in his monthly contest column.

The rules for the successful Club Championships have been revised for 2006. The series will now start in February, rather than January. The reason for this is simple; in the past two years, propagation has been appalling in January, and it has been very difficult to work any other UK stations. The decision was therefore taken to defer the start of the series until February. Contests will also now be timed at 'clock time' rather than GMT, avoiding the problem of contests starting later in the summer months, when we move onto BST. We hope that this will make it easier for some operators to be QRV, though we recognise that it may make the propagation more challenging.

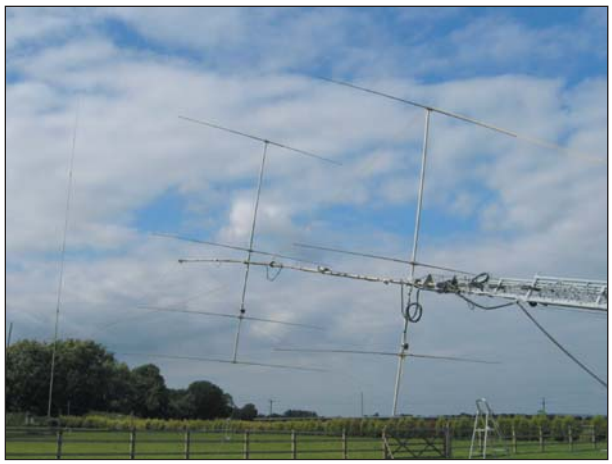
Finally, and perhaps most interestingly, in the data modes, it will now be possible to work a station on both RTTY and PSK. This should encourage increased PSK activity. Check the RSGB HFCC website (www.rsgb-hfcc.org) for the final revision of the rules, but at the time of writing, it is intended to make 3,580 to 3,583 PSK only and also that no RTTY QSOs should take place in this window. If you are operating PSK for the first time, please make sure that you do not overdrive your transmitter with the output from the soundcard, as it is very easy for a badly adjusted signal to take up 3kHz.

The HF Contests Committee hopes that you will continue to support and enjoy the Club Championships as you have done in the past two years.

WHY CAN'T HE HEAR ME?

In a recent entry to Last Word, a reader complained that he had not been able to work GB5HQ in the recent IARU Championship. What were these people doing, he asked? The specifics of this complaint have been investigated and addressed, in a letter to *RadCom*, by Dave Lawley, G4BUO, so I won't comment on that in any more detail. However, it's worth examining the issues here. Before you get all bitter and twisted about calling someone and them not coming back, have a think about the issues. What sort of station is the contest station using? If it's on 28MHz, perhaps it's 400W to a couple of stacked yagis. If you've done any VHF or serious HF work, you'll know that with ERPs like that, you start to get some fascinating scatter effects. However, you do need to bear in mind that scatter propagation like that is not necessarily reciprocal. Indeed, it almost certainly isn't!

For example, during the IARU HF Championship, I was able to hear a 28Mhz CW station located in Yorkshire at G3LZQ's. On my vertical, the signals from John were less than S1 on tropo/scatter – occasionally popping up by aircraft or meteor enhancements – not bad at all over a path of 150 miles on 28MHz. If John's station is running 400W to a pair of yagis, he's going to have a much greater ERP than my 100W to a vertical. Therefore, I shouldn't be too surprised if he doesn't hear me. That's not to say that I shouldn't try calling – I certainly will. But if I don't make the contact, I know why and I won't complain about it! If you are using a 'small system' you will need to recognise that sometimes. You may not be able to contact all the stations you hear.



The 28MHz stack ready to go up at G3LZQ's – as used by GB5HQ

We all know how frustrating that can be, but don't blame the other station! And of course, you never know what receive conditions the other station has – QRM, QRN – noisy neighbours, you name it. So, think carefully before you condemn the operating of a contest station, without fully considering all the factors in operation.

2004 ARRL 28MHZ CONTEST

Many congratulations to Steve, G0CKP, for making 9th place DX in the CW only High Power section operating from M7M. Given the dire conditions, that's a result to be pleased with. Let's hope for better luck in the 2005 event. There's generally some propagation during the 24 hours, but at this stage of the sunspot cycle you really have to concentrate to find the openings!

2005 ARRL RTTY ROUNDUP

Congratulations to MW2I and G6PZ who achieved 5th place and 3rd places respectively in the DX, Low Power and DX High Power boxes. Good to see plenty of entries from the UK, a clear indication of the increased interest in data contesting in the UK in recent years.

MERRY CHRISTMAS!

Finally, may I take this opportunity to wish all readers, wherever you are, a very Merry Christmas. ♦

CONTEST CALENDAR

HF Contests

Date	Time	Contest	Mode	Bands	Exchange
02/04-Dec	2200-1600	ARRL 160m	CW	1.8	RST
10/11-Dec	0000-2359	ARRL 28MHz	CW/SSB	28	RS(T)+SN
17-Dec	0000-2359	RAC Winter	CW/SSB	1.8-144	RS(T)+SN
17/18-Dec	1500-1500	Stew Perry Top Band Challenge	CW	1.8	Grid (eg IO91)
26-Dec	0830-1059	DARC Christmas	CW/SSB	3.5/7	RS(T)+SN

VHF Contests

Date	Time	Contest	Mode	Bands	Exchange
04-Dec	0900-1700	RSGB 144MHz Affiliated Societies	ALL	144	RST+SN+Locator
06-Dec	2000-2230*	RSGB 144MHz activity & Club Championship	ALL	144	RST+SN+Locator
13-Dec	2000-2230*	RSGB 432MHz activity	ALL	432	RST+SN+Locator
20-Dec	2000-2230*	RSGB 1.3GHz/2.3GHz activity	ALL	1.3G/2.3G	RST+SN+Locator
26-Dec	1400-1600	RSGB Christmas Contest	ALL	"50, 70, 144,432"	RST+SN+Locator
27-Dec	1400-1600	RSGB Christmas Contest	ALL	"50, 70, 144,432"	RST+SN+Locator
27-Dec	2000-2230*	RSGB 50MHz activity	ALL	50	RST+SN+Locator
28-Dec	1400-1600	RSGB Christmas Contest	ALL	"50, 70, 144,432"	RST+SN+Locator
29-Dec	1400-1600	RSGB Christmas Contest	ALL	"50, 70, 144,432"	RST+SN+Locator

* Local

144 MHz UK Activity Contests 2004/Club Championship Results

The 2004 144 MHz UKAC enjoyed greater activity than 2003 – over 50 stations entered, compared with 32 the previous year. This is partially due to the introduction of the 2m Club Championship, whereby AFS club members could combine scores from all 12 events over the year to make a club total. 24 stations made DX contacts over 800km – the peak distance being almost 1,500km. This was mostly thanks to excellent conditions during the September event, where all 22 entrants worked over 700km, although good conditions were reported during many other sessions. Each month the results were published on the VHFCC website, allowing entrants to compare scores with team mates and rivals as the year progressed.

Despite the additional entrants, in the UKAC no-one was able to dislodge Bryn, G4DEZ, from the top spot, leaving Roger, G3MEH, in second place once again. Similarly in the Open section, Roger, GW5NF/P, operating with Julian, GW4JBQ, repeated their 2003 win, with Dave, G(W)8ZRE/P, this year in second place. Both stations were operated in the April to September 'summer season'. Hilton, MW0OPS/P, braved cold weather on the hilltops in the autumn and took advantage of the lack of competition in those months to gain some extra points.

In the Club Championship, 27 stations submitted scores on behalf of an AFS. In the early months, the QRZ Amateur Radio Group of Sussex were in the lead, but Colchester's combination of consistent entries from some stations, plus encouraging a number of club members participating, gave them a commanding lead at the end of the year.

Fred, M3HGK/P, wins the Guildford Cup for being the leading Foundation licensee in the UKAC. Congratulations to all of the winners and runners up, and thanks to everyone that took part or persuaded people in their club to have a go at contesting and contribute to their club score. ***Lee Volante, G0MTN.***

Single Operator Fixed Section

	Call	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Score	QSO	Pwr	Ant	Best DX	km
1 *	G4DEZ	2581	1932	2880	2430	2047	2492	2790	3000	15686	1596	2160	2496	6000	1252	400	2 x 12Y	SP2JYR	1238
2 *	G3MEH	1817	0	2134	1848	1494	1825	1925	2000	0	1580	1520	2256	4571	844	400	2 x 10Y	DL8DAU	699
3	G4ZTR	0	0	1863	1738	1554	986	1540	1679	3564	1235	1045	1113	3717	692	100	12Y	OE2WPO/2	989
4	G3KUM	0	468	510	1098	1024	1360	2136	1679	2624	1216	1407	1460	3608	723	400	2 x 9Y	SP3JMZ	1064
5	G6GEC	480	507	1360	1300	855	0	1170	1380	1944	705	1100	765	2814	695	200	13Y	SP3MGM	1025
6	M5FUN	1116	736	1764	630	742	867	1288	1210	2414	180	736	588	2653	658	100	12Y	LA1T	1184
7	G4DBL	0	0	0	0	0	0	2408	0	5440	0	2050	1218	2609	368	300	Yagi	SP2FAV	1393
8	G4PIQ	0	0	0	0	0	0	0	0	17621	4488	0	0	2000	399	400	4x15 + 3x9	SP2CHY	1201
9	G7RAU	1426	0	2024	0	0	0	0	0	0	0	0	0	1255	154	400	17Y	DL0RSH	815
10	G8HGN	0	0	406	0	0	448	1060	768	1288	0	0	525	1240	248	50	2 x 15Y	OE2WPO/2	1002
11	G3YDY	406	312	520	406	396	330	615	480	2156	176	348	476	1114	448	50	9Y	SP1FJZ	1100
12 *	G8ZRE	572	242	570	0	0	0	0	0	0	200	455	595	1038	201	25	8XY	PA60SHB	570
13 *	PE1EWR	120	299	288	0	294	150	264	264	740	286	220	288	710	262	80	10Y	MM5DWW	955
14	M5ADF	0	21	242	96	231	152	180	189	96	0	330	377	628	203	100	9Y	OZ9KY	825
15	G3FIJ	0	0	40	27	161	140	120	90	285	160	100	200	340	181	20	10Y	MM5DWW	847
16	G4XPE	117	0	96	108	0	170	80	77	0	0	135	176	324	108	25	10Y	EI3GE	309
17	M0WYE	0	0	152	176	144	0	210	0	0	72	0	0	287	95	50	5Y	GW8ZRE/P	363
18 *	2E1GUA	135	0	0	91	119	90	154	136	0	0	0	0	285	112	20	13Y	PE1AHX	327
19	M0ZZO	0	250	105	286	0	0	0	0	0	0	0	0	284	69	50	8Y	DF0WD	491
20	GM4BYF	0	80	0	0	0	0	0	0	2054	54	160	91	281	141	400	14Y	DL1RNW	1098
21	G3NAS	0	0	0	0	0	0	0	0	0	0	0	602	241	43	250	10Y	G6DEC	652
22	G1CDO	495	0	0	0	0	0	0	0	0	0	0	0	192	39	-	-	ON4ZN	489
23	GM0HTT	0	0	0	0	0	0	0	0	2616	0	0	0	148	111	400	Yagi	DG3GAG/P	1476
24	G6UBM	0	0	0	0	0	0	60	28	0	30	63	180	139	53	35	13Y	OE5XBL	1001
25 *	M3CVN	297	0	0	0	0	0	0	0	0	0	0	0	115	35	10	9Y	G4RRA	284
26	G7RLH	0	12	63	15	40	33	0	84	91	0	27	0	101	89	25	9Y	OZ9KY	734
27	G4RYV	216	0	0	0	0	0	0	0	0	0	0	0	84	18	10	9Y	DL0SE	562
28	M1CNK	0	0	0	0	0	160	0	0	0	0	0	0	64	18	100	12Y	PE1AHX	465
29	G3JJZ	0	0	140	0	16	0	0	0	0	0	0	0	56	27	25	8Y	G0UWK	244
30	G0HKG	0	0	0	0	0	90	28	24	0	0	0	0	54	47	100	8Y	GW5NF/P	258
31	G0DTI	0	98	0	0	0	0	0	0	0	0	0	0	51	16	100	5Y	G4PIQ	314
32	G4APJ	0	0	0	0	0	0	128	0	0	0	0	0	46	16	25	9Y	G4ZTR	285
33	M3HGK	0	0	0	0	0	0	0	55	0	0	0	45	36	20	10	Vertical	PA60SHB	356
34	G3YNN	0	0	0	0	0	0	0	0	0	77	0	42	34	21	25	9Y	OE5XBL	981
35	M1BQF	0	0	0	0	0	0	0	0	522	0	0	0	30	38	100	9Y	OE2WPO/2	980
36	G3YJR	54	12	0	0	0	0	0	0	0	0	0	0	27	13	3	9Y	ON5AEN	455
37	G0BRV	0	0	27	0	20	0	0	0	0	0	0	0	19	14	25	8Y	G4DEZ	199
38	M0NAS	0	0	0	45	0	0	0	0	0	0	0	0	19	16	25	8Y	G3MEH	88
39	M0SPS	0	0	0	0	0	0	0	0	286	0	0	0	16	22	25	14Y	OZ7CQ	808
40	M0CHW	0	0	0	0	0	0	0	40	0	0	0	0	13	11	100	12Y	G0KYS	267
41	GM4VVX	0	0	0	30	0	0	0	0	0	0	0	0	12	7	25	8Y	GM0HTT	138
42	G0NES	0	16	0	0	0	0	0	0	0	0	0	0	8	6	10	2 x 13Y	GM4BYF	399

Open Section

	Call	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Score	QSO	Pwr	Ant	Best DX	km
1 *	GW5NF/P	0	0	0	960	1206	1520	1296	1950	7602	0	0	0	6000	566	80	7 Y	SP3VSC	1456
2 *	GW8ZRE/P	0	0	0	714	1136	1139	1188	297	5694	0	0	0	4253	445	80	7 Y	OE5XBL	1291
3	MW0OPS/P	0	0	0	0	160	168	0	600	5265	750	702	840	4133	418	50	9 Y	SP2OFW	1441
4	G1WAC	350	0	885	330	528	198	0	60	0	0	0	0	2943	201	100	18Y	PA3AYD	521
5	G4WAC	0	403	0	0	0	0	0	0	0	0	0	0	1000	32	100	18Y	ON7LAO	475
6	G6HOU/P	308	0	0	0	0	0	0	0	0	0	0	0	880	28	10	6Q	ON5AEN	310
7	GW4EVX/P	0	0	0	0	0	410	0	0	0	0	0	434	786	72	10	5Y	PA60SHB	592
8	M0BPQ/P	0	0	0	0	90	0	0	55	2250	0	60	170	687	136	25	5 Y	SP6RGB	1134
9	G4DBL/P	0	0	0	0	0	544	0	0	0	0	0	0	358	35	100	17Y	DC0NAC	780
10 *	M3HGK/P	0	0	0	0	0	0	0	0	120	55	119	0	259	41	100	17Y	OZ2TF	830
11	G3KAC(/P)	0	0	0	0	60	0	84	0	0	0	0	0	115	10	30	10 XY	G3KUM	275
12	G6GVI/M	0	0	0	90	0	0	0	0	0	0	0	0	94	15	40	HB9CV	G8BNE	293
13	G7OOD	4	0	0	0	0	0	0	0	0	0	0	0	11	4	2	10Y	G8ZRE	69

144 MHz Club Championship 2004 Results

	Club	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1 *	Colchester RAC	121	971	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	11092
2 *	QRZ ARG of Sussex	1000	1000	683	191	256	321	324	359	344	720	332	243	5774
3	Aylesbury Vale RS	0	0	0	560	516	676	484	541	0	530	589	814	4709
4	BAE Systems ARC	430	606	527	394	305	0	294	373	264	423	427	276	4319
5	Wythall ARC	314	557	343	100	182	73	0	16	0	0	0	0	1585
6	Lothians RS	0	106	0	0	0	0	0	0	279	398	62	33	878
7	Clifton ARS	0	0	0	0	33	0	0	15	305	0	23	61	438
8	West Kent ARS	0	0	0	0	0	0	15	8	0	191	24	65	303
9	Cray Valley RS	0	0	65	0	12	0	0	0	0	0	0	0	77
10	University of Bristol ARS	0	0	0	27	21	0	21	0	0	0	0	0	69
11	Oldham RC	4	0	0	0	0	0	0	0	0	0	0	0	4

From a distance

It has been a busy past month in the world of HF DXing in spite of the less than favourable conditions. Don Field picks out some of the most interesting activity.

I wrote last month's column while the K7C (Kure Island) operation was still in full swing. We can now look back and see how it turned out from a UK perspective. I am not aware of UK amateurs having made it on any bands other than 20, 30 and 40m, and it looks as though 20m SSB was the easiest slot for those who did need a QSO. A select few managed an RTTY contact during the last couple of days of the operation. But only a handful of my correspondents report success, with several others expressing frustration at a "gotaway". Propagation certainly didn't favour western Europe; members of the K7C team reported that even when they were apparently being heard well in this part of the world, signals were very weak and often unreadable at their end. Fortunately the tables should be turned when Peter 1 Island is activated in February (if the team manages to pull it off this time) as propagation should actually be quite favourable for us on most bands.

The problem with the Kure path from the UK is that it goes right through the auroral zone, suffering the resultant signal absorption. It is interesting to see that NL7Z and KL7HBK in Alaska have recently been working into Europe with a good deal of success on 160m. Topband enthusiasts will recall a similar situation some years ago when KL7H and KL7Y were able to do the same. The common feature is that all these stations were operating from the very north of Alaska, rather than from the Fairbanks or Anchorage areas where most KL7 stations are situated. This has two benefits. Firstly, the total path length to Europe is quite a bit shorter and, secondly, the signals pass through just one intense region of the auroral oval rather than two.

Propagation over the CQWW Phone weekend was surprisingly good, with the 15m band open from the UK at various times to Japan, Australia and the US West Coast. Even 10m produced some North American signals, as well as from the Indian sub-continent. 20m was excellent to all areas. The low bands were in excellent shape too, with some very loud Caribbean signals on160m, for example.

COUNTRIES WORKED, 2005

(starting 1/1/05, sorted this month by SSB totals)

CALL	CW	SSB	DATA	MIXED
G4PTJ	205	184	0	228
M0AWX	117	160	29	197
M5GUS	0	158	0	158
G1VDP	0	141	0	141
MM3AWD	129	137	65	146
M0BKV	97	134	49	165
G3JFS	168	130	157	201
GM0EGI	171	126	0	206
G4WXZ	130	125	0	170
G3YVH	120	116	0	170
G4NXG/M	0	116	0	116
GM0TGE	63	112	0	132
G4OBK	187	111	115	206
G3TBK	193	109	76	200
M3NCG	0	102	0	102
G1UGH	0	102	0	102
G0LGJ/M	0	102	0	102
MU0FAL	138	98	0	151
G4FVK	72	85	0	105
G0RTN	171	83	0	184
M5LRO	24	78	7	100
M0CNP	36	74	66	104
G3LHJ	158	66	94	171
G4DDL	70	60	11	83
G6CSY	0	52	68	87
G4RQI	110	41	31	120
G6HOU	2	39	46	66
2E0TEC	19	38	69	69
G3YJQ	94	26	91	126
GM4KGK	166	10	33	167
G0KBL	212	0	0	212
G4KFT	183	0	0	183
G3HQT	157	0	0	157
G3YMC (qrp)	146	0	0	146
GU0SUP	0	0	129	129
M0BVE	122	0	0	122
G4IDL	105	0	0	105
G3WP	92	0	0	92

DX NEWS

Ole, JX9NOA, is on the air from **Jan Mayen.** He expects to be there at least until next April and perhaps as long as October 2006. He will be active on all bands and modes once he gets his antennas in the air. Roger, LA4GHA, will be signing JW4GHA from Bear Island, **Svalbard**, until June 2006. He will be on all bands and modes. QSL to his home call. Dany, F5CW, reports that the Clipperton DX Club's DXpedition to **Glorioso** (FR/G) has been rescheduled to take place from 17 March to 7 April, after the hurricane season. Updates will be posted on their web page.

Hans, DL7CM, was due to be in **Tanzania** until 18 December operating "holiday style" as 5H1CM on all bands and modes using an IC-706MKGII and 500W amplifier. QSL to his home call. Pete, SM5GMZ, returns to **Bangkok** in early December for a six-month stint as a photo journalist for European news agencies. He'll try to be on the air as much as he can. From 5 to 31 December, he'll try to be on as HS0ZFI on CW, SSB, PSK31 and RTTY. On 6 January, he arrives in **Cambodia** where he has the callsign XU7ADI. He may also make it to **Burma** and **Laos**.

Kimo, KH7U, and another amateur were due on **Palmyra** (KH5) in November for two weeks to undertake the annual maintenance and repairs to the island electronics for the Nature Conservancy. They were also going to install two BiggIR 6.9 to 54MHz verticals, which were sponsored by the Northern California DX Foundation (NCDXF) and SteppIR. Another tower is also to be installed. This is another phase in constructing two amateur HF stations on the island. Though access to these stations may be very limited, it is hoped that they will lead to more and regular operations from this rare DX entity. Palmyra consists of several islands, one (Cooper Island) being privately owned and the remainder classified as a scientific research station and wildlife sanctuary.

The antenna used by team GBOSH on a recent Lighthouse on the Air DXpedition set against a beautiful sunset

DELIBERATE QRM (INTERFERENCE)

Roger, G3SXW (g3sxw@compuserve.com) has penned an open letter to deliberate-QRMers. He say: "Deliberate QRM has become a lot worse in the last year or two – stations who send continuous dee-dahs or other transmissions on the transmitting frequency of DXpeditions, for long periods. We know that they are mostly in Central and Eastern Europe; and 40m and 20m are the bands which suffer most because they are within our skip-distance.

"A team of DXers with directional antennas will direction find these signals. When they have been triangulated, we will find DXers in that local district to precisely identify the guilty individual and then expose him. If you want to join this team and to help build this database, please start to accurately log the date, time, frequency, bearing and signal strength; also describe details of the transmissions so we can match them with reports from other monitoring stations. Please e-mail reports directly to me – I offer to co-ordinate the data-collection. If you already know who is the guilty person in your area, please report this, but please be sure to also build the database evidence against them.

"But while collecting data from this monitoring group let's also try to appeal directly to the deliberate

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

E-mail: don@g3xtt.com

QRMers. They should at least be given the opportunity to respond."

This is the letter Roger intends to send out to the offenders:

"*Dear Deliberate-QRMer, We cannot address this letter to you personally because you are anonymous. But we hope that this letter will reach you. You cause QRM on the DX frequency. We cannot understand why you want to make thousands of your fellow radio amateurs unhappy. Would you please explain your reasons to us?*

"We believe that almost all deliberate-QRMers are in Europe and that there are only a very few of you. You are clearly breaking your licence-conditions by not identifying properly. If you want to remain anonymous (which proves your guilt) please still answer us, addressed to this magazine or directly to me.

"Thank you, Roger Western, G3SXW"

WHEREFORE ART THOU ROMEO?

News has been circulating recently about the incarceration of Romeo Vega, better known to radio amateurs as Romeo Stepanenko, 3W3RR (and other calls). Romeo was the guiding force behind a number of expeditions, several of which were subsequently shown to have taken place from locations other than those claimed (P5RS7, for example, which did not take place from North Korea). It appears, from official and news channels in the US, that Romeo was arrested and extradited from Cyprus to the United States in March 2004, and has been charged with 40 counts of wire fraud and trafficking in stolen credit card numbers. His trial was scheduled to begin in San Francisco on 28 November.

CORRESPONDENCE AND TABLES

It was great to meet several contributors at the HF Convention recently. It's always nice to put a face to the various correspondents. We have some prompt CQWW Phone reports this time, but I expect most will percolate through in time for next month's column.

Mike, G4DDL, reports 9M6/G3OOK on 12m CW, plus some SSB ones in CQWW Phone by way of FY5KE, ST2T, ZD8Z, V26B and VP5DX, all on 15m. Chris, M5LRO, also reports a contact with 9M6/G3OOK, in his case on 20m CW where he also caught S79RRC. On 20 SSB he managed the K7C (Kure) expedition as well as a 10 minute contact with KH6YY (Hawaii) with true 59 signals and VE1KLR who was running just 2.5W. David, M0CNP, had a less successful month, reporting just TI8CBT (17m SSB), WP3C (17m RTTY) and FR1HZ (20m RTTY). But he has also been busy with a Bittern DX Group special event MØNBG/P for Transmission 2005, raising over £600, as well as celebrating Horatio Nelson by activating GB2NNC. Norman, GM4KGK, has been, as he puts it, "succumbing to the charms of Olivia". He feels this new digital mode even surpasses CW for making the most of what's barely there. He says: "The big danger is that it will take the fun out of operating when solid QSOs with VK in the middle of the day become almost routine." But back on CW he did catch 7P8/JH4RHF on 15m, R1ANN on 17m and J6/G3TBK on 20m, although he never even heard K7C. Norman complains about the self-appointed "policemen" who disrupt so many operations, so will probably sympathise with G3SXW's plea elsewhere in this column.

Alan, G4NXG/M, worked 3G1M

9 BAND TABLES No 56

MIXED MODE

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	259	303	329	325	334	330	335	324	332	2871
G4BWP	256	306	333	324	335	330	335	319	326	2864
G3XTT	240	283	321	293	334	321	333	304	314	2743
GW3JXN	202	269	303	298	329	322	324	300	305	2652
G4OBK	205	245	297	303	330	314	322	308	303	2627
G3SED	244	278	304	298	321	303	307	281	291	2627
G3GIQ	153	249	305	271	334	322	333	310	328	2605
G3TXF	145	249	307	306	329	309	327	291	306	2569
G3TBK	151	248	291	285	333	313	324	297	299	2541
G3SNN	188	246	295	254	333	304	326	286	305	2537
G3LAS	124	220	274	285	324	313	321	305	303	2469
G3YVH	149	184	271	295	326	316	318	282	287	2428
G0JHC	64	162	255	291	291	310	319	300	309	2301
G4PTJ	53	207	263	234	326	284	324	276	305	2272
G3IFB	68	232	292	249	327	257	307	251	289	2272
GM3PPE	148	212	259	281	320	271	282	248	229	2250
G3AKU	116	175	247	258	303	271	278	268	276	2192
G5LP	76	234	288	239	312	254	289	196	258	2146
G3VKW	50	176	244	154	329	253	325	266	310	2107
G4WFQ	55	183	240	236	266	237	240	189	205	1851
M0AWX	58	138	182	56	307	271	295	243	254	1804
G4OWT	64	132	217	131	315	177	303	135	274	1748
G4BGW	29	95	207	190	238	215	239	177	223	1613
G4NXG/M	29	62	151	0	299	241	293	204	255	1534
GM4FAM	48	86	134	176	226	215	214	189	167	1455
G0PSE	52	74	149	147	222	146	187	160	191	1328
MU0FAL	26	32	164	162	167	109	210	154	167	1191
G0LRX	11	107	128	0	242	73	262	86	237	1146
G4FVK	44	82	116	67	194	109	198	87	177	1074
2E1RDX	41	52	104	42	195	129	202	132	91	988
M0CNP	11	60	91	16	175	109	164	81	124	831
MM3AWD	1	33	113	11	198	97	126	56	0	635
M5AEF	1	24	28	7	69	92	72	30	40	363
AVERAGE	102	171	227	196	281	240	274	222	245	1959

CW ONLY

G3KMA	253	284	326	325	334	325	332	312	322	2813
G4BWP	237	247	315	322	315	315	317	290	271	2629
G3XTT	231	260	308	293	315	306	311	286	290	2598
G3TXF	145	246	305	306	324	307	322	290	298	2543
GW3JXN	199	254	290	298	316	308	313	280	280	2538
G4OBK	197	230	290	302	317	305	302	291	288	2522
GM3POI	225	256	300	291	314	282	293	254	265	2480
G3SED	243	265	299	298	295	277	279	243	235	2434
G3YVH	148	184	265	295	317	302	301	266	272	2350
G3SXW	99	211	268	277	319	292	304	265	287	2322
G3LAS	123	165	255	284	288	294	293	272	271	2245
G3AKU	116	175	247	258	294	263	268	253	259	2133
G5LP	76	230	287	239	304	254	279	196	251	2116
G3NOH	52	124	213	265	304	292	301	260	272	2083
G4PTJ	51	160	243	234	288	268	295	262	269	2070
G0EHO	16	159	210	212	286	230	280	225	245	1863
G3VKW	44	120	200	153	256	202	280	213	223	1691
G4WFQ	53	179	234	234	217	207	190	155	134	1603
G4BGW	29	94	200	190	189	205	213	167	196	1483
G4OWT	58	126	195	130	255	127	245	108	223	1467
GM4FAM	48	86	132	176	212	203	203	181	150	1391
G0PSE	52	74	148	147	213	145	181	157	184	1301
MU0FAL	26	21	161	162	147	103	190	131	120	1061
MM3AWD	1	17	86	11	83	45	32	3	0	278
AVERAGE	113	174	241	238	271	244	264	223	234	2001

NEXT DEADLINE 8 January 2006
PREPARED BY G3GIQ 8 October 2005

(SA-069), 5Z4/UA4WHX/A (AF-040), S79RRC/A (AF-025) and S79RRC (AF-033) on 20m, 5H1JCH (AF-032) on 17m and S79RRC/F (AF-035) on 15m, for six new IOTAs.

Stan, G0KBL, caught both K7C and C21XF on 30m and KH0/JM1YGG on 40m. Phil, G4OBK, comments on the dire band conditions for the 21/28MHz SSB contest. Elsewhere, he worked K7C on 40m, 30m and 20m, and the C21 guys (G3TXF and G3SXW from Nauru) on 15m through 40m. Phil was also pleased to catch KL7HBK on 160m, his first on the band since 2002.

Dave, M0BVE, reports some nice ones on CW, including HF0POL (South Shetland) on 12m, R1ANN (Antarctica), 7Z1UG and V51AS on 15m, 9L2YM on 17m, 3B9FR on 20m and HI8RV on 40m. Peter, G3JFS, reports 5H1JCH and DU7/G4DUN on 20m and TR8CA on 15m, all RTTY, taking him over the 200 mark on that mode. Terry, G1UGH, caught 5Z4DZ, A61R and 5N8NDP on 17m and FR1AN (Reunion) on 10m, all SSB.

Graeme, G6CSY, abandoned his usual RTTY for the CQWW Phone weekend. He mentions the overcrowding on 40m, which, hopefully, will ease as more countries gain an extended allocation on the band. In the end, his low power brought him only a handful of contacts in the face of so much contest activity. I suppose you could liken this to a family car trying to compete on a racetrack. There are plenty of contests where activity is less and low power stations can make a greater impression, and low power works much better on CW too, but CQWW Phone really is a tough one (although I was operating at G5W and we worked several North American stations, for example, who were running just 5W).

Brian, GM0EGI, worked three all-time new ones since his last update, by way of T88BH on 20m (CW and SSB) and 30m CW, plus KH9/W0CN and K7C on 20m SSB. Alan, G3YVH, also caught K7C on three band slots, leaving him with just the Laccadive Islands to work for a "full house". You may have to wait a while for that one, Alan!

Derrick, G3LHJ, reports C21XF and XE1KK on 30m plus 9N7JO on 20m CW as the best of the month. Phil, GU0SUP, continues to focus on RTTY and caught OX/DL7WB and UK/JI2MED (no band mentioned) plus 3A2MW on 40m and 20m. He feels this sunspot minimum is nowhere near as bad as the last one where HF propagation is concerned, with 20m in particular being very much better. He comments that the contributor who tried working Bob, ZL2AMI, during the afternoon on 20m may be unaware that Bob is regularly worked in RTTY contests in the 1100 to 1600 time frame, having decided to take his sleep periods earlier in the contest.

Peter, G3HQT, managed contacts with RU3HD (Antarctica), ZS6ME and VK8AV on 15m, 9M2TO on 17m and 8R1J and 5Z4/UA4WHX on 20m. But otherwise, he says, the bands were so uninteresting he even resorted to doing some gardening!

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 **24 December**. ♦

WEB SEARCH	
Glorioso	http://glorieuses2005.free.fr/index-en.htm

HF F-Layer, Propagation Predictions for Nove,ber 2005

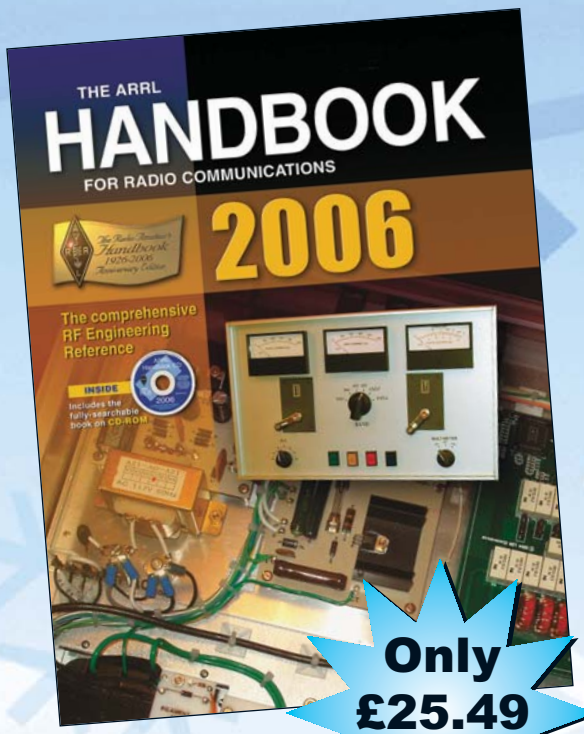
Compiled by – Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** EUROPE								
Moscow	998....89899	8.8623797679	...87798....	...8998.....	....999.....	....99......	.....	.....
*** ASIA								
Yakutsk	2......36555	5..32..743..	...73.......	.....	.....	.....	.....	.....
Tokyo	......22112.	...63366223.	...63.32....	.....	.....	.....	.....	.....
Singapore	21121	785556	.....487...2	.....782....	....376.....	....464.....	....45......	.....
Hyderabad	.........1.1	4......55552	3.....572.2.	.....275....	...2246.....	....353.....	....43......	.....
Tel Aviv	886....68888	8682..198768	...84589....	...9889.....	....775.....	.....	.....	.....
*** OCEANIA								
Wellington	.....	....6774....	....676.....	....563.....	....24......	.....	.....	.....
Well (NZ) (LP)	.....	.....	.....	.....	.....	.....	.....	.....
Perth	.....	......36333.	......76....	.....172....	....278.....	....476.....	...477......	....66......
Sydney	.....	.....57411..	....1882....	....586.....	....886.....	....77......	....77......	.....
Melbourne (LP)	.....	....2.......	...16.......	....6.......	....73......	....63......	.....	.....
Honolulu	....1..1....	...12324....	.....5352...	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....	.....	.....	.....	.....
W. Samoa	.....	....6564....	....8885....	....575.....	.....4......	.....	.....	.....
*** AFRICA								
Mauritius	2........111	6......56656	4......74424	.......6....	......22....	......2.....	.....	.....
Johannesburg	88.......688	99......8999	871....78978	4..3114875..	...55467....	...46566....	...7888.....	...5777.....
Ibadan	562.....1565	888.....8888	9.96...59956	...9766897..	...99999....	...99999....	....999.....	....999.....
Nairobi	3.......1222	77.....27777	.72....67777	..52..3853..	...76678....	...77775....	...7777.....	...4454.....
Canary Isles	8882....8888	99881..39899	88.852277866	....7678....	....565.....	.....	.....	.....
*** S. AMERICA								
Buenos Aires	5656.......3	8869......57	34.8.......1	...6........	....6433....	....6554....	....5453....	......4.....
Rio de Janeiro	1213.......1	6628......35	23.8.....1.1	...5........	....7546....	....7556....	....6334....	.....
Lima	11.1........	3416.......2	.1.3........	.....	.....764....	.....663....	.....55.....	......3.....
Caracas	222........1	6737......56	23.73.......	....6.......	.....534....	.....653....	.....67.....	.....
*** N. AMERICA								
Guatemala	1111........	34.55......2	...14.......	.....2......	.....	.....	......2.....	.....
New Orleans	2221.......1	66.61......6	...22.......	......1.....	......87....	......85....	......7.....	.....
Washington	6664......35	88.84....378	.....1..2...	.....7553...	......77....	......85....	......5.....	.....
Quebec	8887......88	77.86...2875	.....1..5...	.....6663...	......99....	......97....	......8.....	.....
Anchorage	333.........	74.7534672 27	.....	.....	.....	.....	.....	.....
Vancouver	111.........	41.3.......2	.......2....	.....	.....	.....	.....	.....
San Francisco	.....	22.22.......	.....	.....	.....3....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....4....	.....3....	.....	.....

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 2005 issued by the Sunspot Data Centre, Brussels, was 8.5. The daily maximum / minimum numbers were 17 on 5 October, and 0 on 13, 24, 25, 26, 27 and 28 October respectively. The predicted smoothed sunspot numbers for December, January and February are respectively: (SIDC classical method – Waldmeier's standard) 27, 26, 25 (combined method) 20, 19, 18. 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.

Season's Greetings



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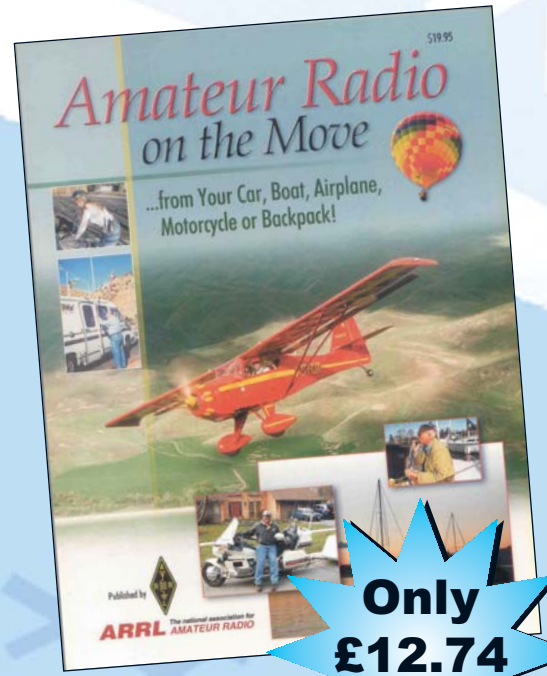

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Staying active

VHFers and UHFers could be forgiven for wondering where their bands have gone, given the recent terrible propagation conditions. Nevertheless, Norman Fitch has some interesting VHF and UHF activities to report on, including EME operation from Christmas Island and further developments of WSJT software.

The well-known proverb that 'After the Lord Mayor's Show comes the dustcart' could well apply to propagation conditions on the VHF bands as this report is being compiled. With the summer Sporadic-E (Es) season long over, the 6m band has gone into the doldrums but let's hope that we get some winter Es after the year-end.

SOLAR AND GEOMAGNETIC DATA

In the 30 days to 11 October, the Sun was spotless on 1-3 October and the highest sunspot number was 95 on 13 September. The 10.7cm radio flux peaked at 119 units on 15 September and the minimum of 72 occurred on two days from 30 September; the average was 87.2, continuing the steady decline. Only five new regions were recorded. Geomagnetic activity was low with no significant auroras and on 22 days the mid-latitude A-index was quiet, *ie* 10 or less. The highest recorded value was 26 on 13 September.

ATTENTION TO DETAIL

In the October VHF/UHF, Ken Punshon, G4APJ (IO83), commented on GW4DGU's (IO71) good 70cm signals across the Welsh mountains and this brought a very interesting and much appreciated e-mail from Chris Bartram. He writes that to get good results on the band requires quite a lot of attention to detail. His station is entirely solid-state and the transmitter generates about 550W in the shack of which 380W reaches the antenna as measured with proper professional equipment. The PA consists of four Semelab D1020UK DMOSFETs combined in-phase with a coax Wilkinson on the input and a hybrid slab-line/coax Gysel coupler on the output.

The feed to the antenna is an LDF5-50 cable to the top of the first tower section then FSJ4-50 to the preamp switching box in the middle of the array. The preamp is home made and employs a pHEMT driving a broadband, low-noise IC amplifier with a measured noise figure in the order of 0.5dB. Measured cold sky-to-ground noise ratios are typically around 6.5dB and in normal tropo operation, his receiver threshold is 3-4dB above the cold sky figure.

Regarding the all-important antennas, Chris writes: "My antenna is a pair of home designed 5.7WL (4m boom) Yagis. These use continuous exponential tapers of both element spacing and element length, and have relatively few elements per unit boom length. I've stacked the 432MHz antennas vertically with a 6m boom 2m Yagi and a 14WL 1,296MHz Yagi. In an attempt to understand potential interactions, I've modelled the complete structure, and I'd recommend that anyone wanting to co-site antennas does the same. I simulate an antenna gain of just about 20dBi from the 432MHz antenna system. Just mounting antennas randomly one above the other on a mast can, and I suspect frequently does, result in some unwanted degradation of performance. Many of the folklore rules of thumb seem not to be borne out in my simulations. In normal operation, the antenna sits at about 20m AGL."

He doesn't have a 'super site' and, although located at 200m above sea level, has positive horizons in the direction of most population centres. His best DX (ODX) so far is N9AB (EN52) *via* Earth-Moon-Earth (EME) and he has worked a few others off the Moon but is limited by being unable to elevate the antennas. On 70cm tropo, he has worked most of the active stations in the Canary Islands at about 2,800km and he has completed a number of meteor scatter (MS) contacts on the band.

WSJT NOTES

Joe Taylor, K1JT, posted the following comments on computer sound cards on the Moon-Net website: "In general, 'high end' sound cards offer no advantages when used with WSJT. Motherboard AC-97 compliant sound systems are cheap and work well. If you need to buy a sound card for use with WSJT, my advice is to get a simple one. You do *not* need 8-channel surround-sound, wavetable synthesis, special effects, etc. Those features are for games and listening to music, and they will be wasted on WSJT.

"Likewise, you do not need 24-bit A/D and D/A conversions. Specifications to do with signal/noise ratio are quite irrelevant for use with WSJT, as you should never be operating in a regime where A/D quantising noise (or any other noise generated in the sound card) contributes significantly to the system S/N.

"If you have a choice, get a card that offers a native sampling rate of 44,100 or 11,025Hz, or both. (Unfortunately, it is often very difficult to tell from the manufacturer's literature whether this capability is present or not.) If native sampling at 11,025Hz is available – or if the manufacturer has at least provided a well-designed re-sampling capability – the soundcard sample-rate factors (displayed by WSJT in the bottom left corner, if 'Setup->Enable diagnostics' is checked) should both be very close to 1.0000."

Joe recently released version 5.8.6 of WSJT following the fix of several bugs reported by users of the *beta* releases of 5.8.1 and 5.8.3. He recommends that users should read the top portion of the Upgrade History text for a full description of program changes from earlier versions – see Web search.

Concerning JT65, he writes: "JT65 signals near the threshold of readability are buried some 30dB below the audio noise power coming out of your receiver. A necessary consequence is that success in decoding such signals varies in a stochastic manner that can be quantified probabilistically but cannot be predicted for specific instances. Whenever significant changes are made to the JT65 decoder, I always run an exhaustive series of tests using locally generated signals and carefully

LOCATOR SQUARES TABLE

Starting date: 1-1-1979

Callsign	50MHz	70MHz	144MHz	430MHz	1296MHz	Total
G4DEZ	734	53	322	105	50	1264
G0FYD	736	1	305	57	26	1125
G0JHC	1040	26	48	4	-	1118
GW7SMV	684	-	260	-	-	944
GW3LEW	464	14	256	43	6	783
G4YTL	11	56	560	141	14	782
G4VPD	488	19	237	18	-	762
GW3HWR	478	31	187	34	-	730
M5BXB	453	15	192	57	-	717
G8TOK	432	45	145	58	34	714
G6TTL	427	-	140	94	28	689
G8HGN	367	-	215	82	-	664
MU0FAL	576	5	61	9	4	655
G4OBK	493	38	95	11	-	637
G3XDY	-	34	261	179	130	604
GM4VVX	323	34	184	2	-	541
G0GMS	200	-	290	-	-	490
G3FIJ	278	29	108	51	23	489
G3YDY	127	-	173	69	-	369
M1DUD	294	1	54	10	-	359
EA7IT	209	-	108	-	-	317
G4APJ	205	-	64	33	-	302
M0XLT	263	-	21	2	-	286
G3FPK	30	-	246	-	-	276
G8VYK	76	4	179	25	-	284
MM3ERP	91	3	83	22	-	199
G8RWG	50	-	132	-	-	182
MM1FEO	59	-	26	1	-	86
2E1GUA	18	-	27	16	-	61

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Next deadline is 6 December

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controlled conditions. Typically, these tests involve many tens of thousands of decodings. You can read some details about the procedures and measurements in my paper published recently in *QEX*." It is available also on a website – see Web search.

He adds: "The situation with FSK441 is somewhat different. As stated in the release notes, the FSK441 decoder in v5.8.x is not the same as the one in 4.9.8. Rather, it is nearly identical to those in WSJT versions around 3.8 to 4.3, which have been shown to perform better. Just as with JT65, if your computer's audio system is not communicating properly with WSJT 5.8.x, you are likely to see poor performance. Such sub-par results do not represent a failure of the decoder, but rather of the audio I/O. I hope to have such problems resolved soon, while still maintaining all the real-time advantages offered by WSJT 6."

METEOR SCATTER

G8VYK, operated by G4AEZ, has worked some of the usual stations on 2m using WSJT v5.8.6 and is pleased with its performance. By now Brian should be using version 6. Bryn Llewellyn, G4DEZ (JO03), added two more 'wet' grids in the North Sea thanks to G0KZG/MM and also completed with OH8K (KP44).

According to the OH5IY program, the Leonids shower should peak at 1250 ±12 hours on 17 November with a zenithal hourly rate (ZHR) of 20 and the radiant is above a mid-UK horizon from 2230 to 1430. The Geminids, one of the major annual showers, should peak at 0430 ±6 hours on 14 December with a ZHR of 120 and its radiant is above a mid-UK horizon from 1630 to 1230. The last shower this year will be the Ursids, the data for which is 1410 ±3 hours, 22 December, 10 and is available all day.

BAND REPORTS

50MHZ

One word sums up 6m conditions lately and that's 'dreadful', illustrated by Ted Collins, G4UPS (IO80), whose sole September QSO was on the 9th at 0729 with OZ4VV* (JO46). Steve Inman, 2E0KBJ/P (IO93), made some UK contacts although a few European beacons were heard. Welcome to Carl Ratcliffe, 2E0TEC (IO91), who started 6m operation on 27 August. His tally of stations so far includes Es contacts with EH9IB (IM85), OY1OF (IP62) and three of the

MOONBOUNCE

Johan Van de Velde, ON4IQ, posted a brief note on the Moon-Net about the recent PJ7/ON4QX activity from Sint Maarten. On day one, the amplifier was dead so the European window at moonset was missed but one US station was heard. 36 QSOs were completed on days two and three. Two hours of calling CQ during the USA window produced no callers (decodes). Four QSOs were made on day four, then the elevation gear broke down. The cost of the DXpedition was more than $2,000. About $100 of sponsorship money was received, with equipment and antennas provided by ON4IQ.

Joop Mutter, PA0JMV, passed on details of Rex Moncur's activity from Christmas Island as VK9XMO (OH29) following his highly successful one-man DXpedition to the Cocos Keeling Islands mentioned last month. Up to the time of e-mailing, Rex reported 92 contacts completed, the great majority on 2m, plus a few on 70cm using WSJT. He is delighted with these results and wrote: "Thanks to all who participated and gave me such great contacts. It was all beyond my expectations for a small station that can be carried on an aircraft."

He gives special thanks to Dave Avery, VK2AWD, for his efforts in keeping people informed of his operations and passing on details of completed contacts. Christmas Island has a large ethnic Chinese population and his visit coincided appropriately with the Moon Cake Festival at full Moon when he found hundreds of people carrying lanterns. They gave him a piece of Moon cake. Full details of Rex's operation are on Joop's website - See Web search.

Using just 200W to a single 15-ele Yagi, Brian Oughton, G4AEZ, operator of club station G8VYK (JO01), completed with W5UN and KB8RQ on 2m using WSJT v5.8.6. Howard Ling, G4CCH (IO93), was QRV in the 12th Italian EME contest over the perigee weekend of 17-18 September. Although conditions were good, the low lunar declination meant that a large part of the operating window was during night-time hours. Activity was low with a marked absence of most of the regulars and 'big guns'. He completed 18 QSOs on 23cm for a claimed total of 243 points with K5PJR and WA5WCP new initials. In the following activity weekend (AW), he completed on CW with LA9NEA, RW1AW and OK1DFC. K7XQ was O/RO and while Jeff was S3, the chirp on his signal made copy too difficult for an exchange of RST reports.

Mark Hughes, GM4ISM (IO85), has finally tamed his K2RIW 70cm PA which had been behaving as an oscillator until he found and fixed the cause, a corrosion on one valve base. As soon as he fixes his elevation rotator, he plans to re-install his four 21-ele Yagis. Stuart Jones, GW3XYW (IO71), has been QRV on 2m JT65B and is now using WSJT-6 which works well now that some small bugs in v5.8.6 have been fixed. In the 15-25 September period, he completed with S52LM, RN6BN, EA5SE, UA4AQL, RW1AY/1, SV8CS, RA6DA, DL7UAE, DL7FF, EI4DQ, EB5EEO, PE1L, IK2DDR, 5B8AD, OK2DIG, EA2AGZ and PE1LWT. He runs 400W from a home built amplifier with a pair of 4CX250B valves to four 10-ele Yagis. His transceiver is an FT-736 with a home built DJ9BV MGF1302 preamp. He hopes to be QRV again on 23cm before Christmas.

Dan, HB9Q (JN47), has started compiling a list of stations active on 70cm using JT65 mode. As of 16 September, there were 21. You can see the current list on his home page – see Web search – and if you are not on it send an e-mail to dan@hb9q.ch giving your callsign, full locator, antenna system, power, if you are actually QRV (yes/no) and the number of QSOs completed.

The next AW in on 17-18 December when London latitude stations will have about 32.7 hours of Moon time. The declination varies from +28.03° to +23.47° and the 144/432MHz sky temperature range is 460/35K to 228/17K. The signal degradation referred to perigee ranges from -1.62dB to -1.84dB. The Sun offset at Saturday midnight is -153°.

Dick Hanson, K5AND, mentions a proposed EME operation on 6m, 2m and 70cm in January and/or February next year from 3Y0X, Peter 1st Island. When he posted this news on the Moon-Net website, some equipment was still needed. For further information contact Gordon Hardman, W0RUN, at Gordon@alpharadioproducts.com

PHOTO: VK7MO

The antenna farm used by Rex Moncur, VK7MO, during his VK9XMO EME operation on 2m and 70cm from Christmas Island. The 70cm Yagi was assembled on site using insulation tape and the desired elevation was achieved by a shopping bag filled with sand hanging off the back end.

HAs who were licensed for August.

Kevin Jackson, M0XLT (IO83), notes a few days when TV video signals were heard in September but his only QSOs were via Es on the morning of the 15th with SQ9CWO (JO90) and OK2PMX (JN88). Clive O'Hennessy, GM4VVX (IO78), only made three QSOs in September. He tried to get his local club, the Sutherland and District ARS, to get some interest in the band in the UKAC on the 27th but only worked near neighbour GM7ASN and MM0LOZ.

70MHZ

GM4VVX is the only contributor to mention 4m and although several beacons were copied *via* aurora in September, no QSOs resulted. Clive operated /P (IO78VB) in the contest on the 18th but only made five QSOs with just 8W. ODX was G4DEZ at 604km, the others worked being G3JYP, GI4KSO, GM4JTJ and MM0SMD/P. He writes: "Thanks to a very generous gift of a couple of A200s from Steve, M0BPQ, I now have 35W output. They were in need of love and attention, but almost complete. I have restored one to give me 35W and the other is still under the soldering iron but I am hoping for a full recovery."

144MHZ

Steve Bunting, M0BPQ/P (JO01), completed 240 contacts with stations in 65 grids in the Trophy Contest over the 3-4 September weekend when ODX was OE5D (JN68) at 999km. In an early morning aurora on the 11th, 2E0KBJ/P worked GM4VVX. G4DEZ was QRV in the Cumulatives session on 4 October and mentions QSOs with OK1RI (JN60), SK7MW (JO65) and a couple of OZs. Bryn added a further 10 North Sea 'wet' grids on SSB thanks to G0KZG/MM.

In September, Bob Harrison, G8HGN (JO01), made 44 contacts with stations in 26 grids and nine countries in the Trophy Contest when ODX was EA3EZG/P (IN93) at 943km. In the UKAC on the 6th, he had 62 QSOs with stations in 26 grids and seven countries. ODX was DF5ZX/P (JN47) at 677km. In the UKAC on 4 October, he completed 47 contacts with stations in 20 grids and five countries when ODX was DC0NAC (JO43) at 661km. GM4VVX found that the aurora on 10 September was a southern event with a predominance of F and G stations worked although Clive did have QSOs with DL, GM and LA stations. There was another strong aurora on the 15th with very loud signals from southern Gs, only one of whom was worked in low activity.

430MHZ

The only 70cm report is from G8HGN who was QRV in the UKAC on 13 September when Bob made 27 contacts with stations in 13 grids and five countries. ODX was DB5KN (JO31) at 467km.

FINALE

On a sad note Martin Dale, G6ABU, reported the death of Dave Chapman, G8IMC, who was one of the leading members of the Parallel Lines Contest Group since it was formed. Martin says: "As a fellow member of the Nottingham ARC in the late-1970s and early-1980s, [I can vouch that] his encouragement and commitment were second to none."

Thanks to Andy Barter, G8ADD, editor of *VHF Communications*, for the copy of the autumn edition which, as always, is full of interesting articles. The deadline for copy for the February edition is *very* early on **6 December** and for March, when I'll need your final 2005 annual table figures, it's **10 January.** My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk, so have a nice Christmas and maybe find an hour or two to participate in the Christmas Cumulatives. ♦

WEB SEARCH

VHF Communications	www.vhfcomm.co.uk
WSJT upgrade notes	pulsar.princeton.edu/%7Ejoe/K1JT/UpdateHistory.txt
WSJT JT65 notes	pulsar.princeton.edu/%7Ejoe/K1JT/JT65.pdf.
VK9XMO details	www.planet.nl/~pa0jmv
70cnJT65 list	www.hb9q.ch

HELPLINES

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, G4DED, would like to know if anyone has had experience using the **MFJ-794H antenna tuner**? G4DED, QTHR. E-mail: g4ded@ukonline.co.uk
- Stan, G4DPV, needs the circuit diagram of the **Telequipment oscilloscope type DM64**. All expenses will be refunded. G4DPV, QTHR. E-mail: stand@madmart.demon.co.uk
- Harry, G3MFW, is no longer able to get to the big radio rallies, and wants **two cheap wide-angle CCTV cameras**, one B/W and one colour, in connection with his work for the blind. Will anyone going to rallies please give his name and phone number to any stallholders selling such items? G3MFW, QTHR. Tel: 01726 73608.
- Pat, G3MA, is looking for service and user manuals (or photocaopies) for the **Yaesu FRG-7000 receiver**. All expenses paid. G3MA, QTHR. Tel: 01452 539 519.
- Ray, G3LHA, is refurbishing a **Sony CRF160 receiver**, but he needs copies of the circuit diagram and any other details. All costs will be refunded. G3LHA, QTHR. Tel: 024 7641 4333.
- Due to medical problems, Tony, G3ICB, is unable to complete the rebuilding of the **MTB400 marine transmitter**. Would any skilled constructor in the Newbury/Reading area be interested in cooperating on this project? Some financial arrangement could be agreed. G3ICB, QTHR. E-mail: tony.bull@ntlworld.com
- Wilf, GD0IFU, is looking for a manual for the **Yaesu FT-290R**. All expenses will be paid. GD0IFU, QTHR. Tel: 01624 629 455.

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LF

A miscellany of LF news, ranging from attempts to cross the Pacific, to the reception of SAQ in America. A list of new callsigns on the band is a good sign, and G3YXM notes some individual UK developments.

In October, Scott Tilley, VE7TIL, and Steve McDonald, VE7SL, went to South Pender Island, British Columbia, to try for that elusive two-way contact with ZM2E. They made their biggest effort yet with Scott's 900W transmitter and a 100ft tall aerial complete with earth radials running down to the sea shore. Meanwhile, ZM2E, at Quartz Hill, near Wellington, New Zealand, was setting up to try for two-way contacts with both VA7LF and RU6LA. They had made a mid-week booking of the club station so as to avoid times of HF contests in which ZL6QH was active.

In the event, ZM2E's signal was copied by the boys at VA7LF, but no signals made it over to New Zealand. VA7LF's signal was obviously getting out pretty well, as they had reports from many listeners around the US – including Jay Rusgrove, W1VD, in Connecticut, at a distance of 4000km over land.

SAQ TRANS-ATLANTIC SUCCESS.

In late September, the Alexanderson alternator at Grimeton, Sweden, was spun up again to produce that familiar 'soft' keying on 17.2kHz. This time, the transmission was received by R J Mattson in Highland, New York, FN31AR and by W1VD. Copy wasn't 'Q5', mainly due to some strong static.

NEW ON THE BAND

Dick Rollema, PA0SE, tells me that there are at least two new PA stations on the band. First to be heard was Hans, PA3GXB, in Rozenburg, west of Rotterdam, locator JO21CV. He was using a Ropex transmitter. Hans was also heard by G3GRO, but Derek was having too much interference from Rugby Loran to establish a contact.

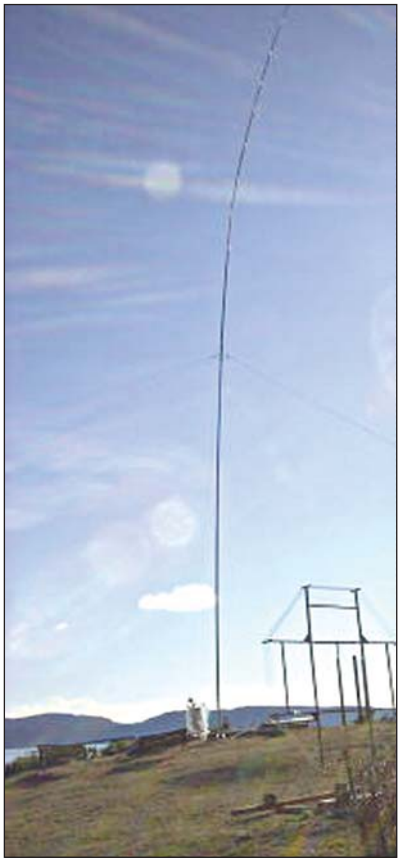
The next station to attract Dick's attention was Jan, PA0VHF, also at Rozenburg. There must be something in the water there!

Chris, G3XIZ, has worked Peter, M0FMT (G8FMT), who is only running 10W, on a few occasions during August.

SWLs Hartmut Wolf and Ko Versteeg both reported reception of DG0RG in late August. I have no QTH information for him yet.

Rüdiger, DK6JL (JO31AH), has been testing his 10m vertical aerial recently, but his 100W transmitter may not be powerful enough to make it across to the UK.

Tom, DL4EAU (JO51DR), announced recently that he is QRV on LF. His transmitter is a transverter from 10MHz with a 500W PA, and his aerial is an inverted-L with about 300pF of top-loading. Initially, he is using straight CW and is looking for contacts outside Germany.



The 100ft mast at VA7LF.

UK DEVELOPMENTS

A quick round-up of news from UK stations.

Gary, G4WGT, has been putting considerable effort into improving his signal over the past few months. He has made a number of modifications to his G0MRF transmitter, mostly the M0BMU ones detailed in the October 2004 'LF' column. He now has over 400W at his disposal and the new aerial, built after an arc problem with the old one arc, seems to be able to handle the power. He has been beaconing on QRSS and has had reports from around Europe, but is still waiting for that trans-Atlantic report!

Let's hope the new transmitter of Chris, G3XIZ, has by now passed that 'difficult' stage where FETs go bang every other day and he's starting to see some reliable power output. He did manage to work F6BWO and DK4U before the last explosion and has had good reports from Hartmut Wolf in Northern Germany.

Dave, G3WCB, has been working on his 200W QRSS setup and has received reports from F6CWN, Hartmut Wolf, and others, so it looks as though he's getting out well enough. His receive system seems to be pretty effective too as he's copied WD2XGJ on a few occasions over the summer.

Peter, G3LDO, announced recently that he going QRT on LF because he needs his aerial masts for other projects, most notably for the 'Antennas' column in the *RadCom*, and has disposed of much of his gear. He will be missed by LF operators, not only for his excellent signal with many DX contacts and 'firsts' to his name, but most notably because he was one of the very first to get a signal out on 73kHz. Come back soon, Peter!

DX

Hartmut Wolf had quite regular reception of VO1NA through the summer, static permitting. Signals from WD2XES and WD2XGJ were often seen when conditions peaked with occasional sightings of WD2XKO on the best nights.

NEW VERSION OF *SPECTRUM LABORATORY*

Wolf, DL4YHF, has recently uploaded the latest version (V2.5 build 7) of his excellent *Spectrum Laboratory* program which has some new features.

Wolf has enhanced the 'colour direction finder' mode (aka 'directiongram'), so that it is now possible to suppress noise from up to three directions.

He also claims that the program is not as resource-hungry as V1.9 to V2.3, so it shouldn't crash when running multiple instances.

ON6ND SILENT KEY

I was sad to hear of the death of ON6ND in August. Werner was a regular user of 136kHz and his signal was one of the best from Northern Europe into the UK. He was always experimenting with aerials and other projects and encouraged others to get on the band. One such convert was Ruddy, ON6UX, who writes of Werner: "He was a very good friend. I first met him in 1969. From that time we did a lot of experimenting together, especially on 10GHz and, for the last few years, on 136KHz. I could write a book about him... He was always building equipment, antennas, windmills, pipe-organs, boats, telescopes and so on. He was a man with many, many talents". ♦

WEB SEARCH

DL4YHF's Spectrum laboratory program http://people.freenet.de/dl4yhf/spectra1.html

ON6ND's 'Water analogy' of aerials www.wireless.org.uk/newspic31.htm

RadCom Index - Vol 81 (2005)

RadCom Index - Vol 81 (2005)

Summit for everyone

The Radio Society of Great Britain put on another highly successful HF Convention in October. The event offered something for all – from hardened DXers to newcomers. John Gould, chairman of the convention organising committee, reports.


PHOTO: G4JKS


PHOTO: G4JKS

Top, from left: G3IZD receives the G3PSH Memorial Trophy for winning SSB Field Day 2004.

Proof that HF DXing is not exclusively an old man's sport, ten-year-old Katie, M3XPO, was awarded with the G5RP Trophy at the HF Convention. The trophy is awarded each year to a newcomer to HF DXing who has made great progress over the previous year.

An attendee takes some time out from the presentations to test out the amazing new Yaesu FTDX9000D.


PHOTO: G3WKL

The RSGB's popular HF Convention was held at the Worth Hotel in Gatwick for the second year in succession in October. Although this venue has yet to gain the legendary status of fabled HFC homes from the past – such as The Beaumont or The Belfry – it might only be a matter of time before it does.

A return to the traditional weekend format – and the blessing of autumnal sunshine while it took place – certainly made this year's convention one that we will remember with much fondness. The interesting and varied programme helped to attract a good gathering. The attendance was about 5% up on 2004, with the busiest day being Saturday.

One of the fascinating aspects of every HF Convention is the opportunity to meet top overseas DXers. This year was no exception, with famous names such as Jim, VK9NS, Jukka, OH2BR, and Wayne, N7NG, in attendance.

Although we are currently at the bottom of the sunspot cycle, there were plenty of interesting reports of successful DXpeditions. Attendees were treated to talks by XE1KK and K9AJ in the Islands on the Air (IOTA) session, and also presentations on DXpeditions to FT5XO, 6O0CW and, only a week after the operation, C21SX/XF. There were also some forward-looking talks, such as K3NA's analysis of how best to work 3Y0X, hopefully in a few months time. A wide range of subjects were also covered by G3SXW, G3PJT, G3SJX, G0KYA and G4FSU in their presentations, each of which attracted a large audience.

Leading ham radio equipment maker Yaesu launched its new flagship FTDX9000 transceiver at the convention with both the D and the MP variants on display. This was apparently the first time both had been together on display outside Japan. Many attendees had their first chance to have a go on them at the demonstration station, with Yaesu's Paul Bigwood, G3WYW, taking them through their paces on both days of the convention.

On the technical side, the convention was perhaps larger than ever. Unusually, there was a fourth series of presentations on the Sunday dedicated to more advanced technical matters. However, we were careful to keep the programme broad and so included a number of sessions for newcomers and special interest forums.

With the community service aspect of amateur radio so important, we had two sessions on emergency communications – one from the team who were part way through a major DXpedition in VU4 when the Indian Ocean Tsunami struck, and one by G3LEQ looking at the lessons learnt from the Tsunami relief operation.

The former was presented by Mohar, VU2MYH, by internet video conferencing from the Indian National Institute of Amateur Radio

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PHOTO: G3WKL

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Bottom, from left: The DX dinner provided plenty of opportunities for networking.

Paul Bigwood of Yaesu (UK) – cosponsor of the event – presents a cheque to Martin Atherton, G3ZAY, for IOTA sponsorship.

Cosponsor of the event Martin Lynch chats with two customers.

Left: The Gatwick Worth Hotel proved a hospitable and convenient venue for the convention.

headquarters in Hyderabad. Bharathi, VU2RBI, was meant to have participated in the video conference from New Delhi, but the devastating Kashmir earthquake just hours before meant that she needed to focus her attentions elsewhere. This is the third year that we have run video conferences at the HFC, demonstrating the potential for bringing top radio amateurs, who we would otherwise not be able to get across to the UK, right into the heart of the convention.

The convention also provided the chance for aspiring radio hams to take their Radio Communications Foundation licences. Several candidates sat more than one exam, with two gaining the Foundation licence, two the Intermediate licence and 11 the Advanced (Full) licence. Well done to the candidates, the exam team (G8OSN, M0OBW and G0HIQ) and the instructors and clubs who kindly helped candidates complete some, or all, of their practical assessments prior to the convention. Candidates were also able to take the American FCC exams at the convention, with five new Extra and one General class licences being awarded. The FCC exams were made possible thanks to a team lead by G0VEP with help from K2WR.

During the convention, card checking by N7NG, G4BWP, G3LZQ, G5LP, G3RTE and GM3YTS processed 60 applications and 5,000 QSL cards for DXCC and in addition applications for 5BWITZ, 5BCCC, IARU Region 1 Award, WAC and DXCLA.

In putting on the event, we once again must thank our main sponsors Yaesu (UK) and Martin Lynch & Sons whose support is crucial in financing the event. We also need to thank Yaesu (UK) for the first prize in the DXpedition Fund raffle of an FT-897 all-mode 1.8-430MHz multimode transceiver won by Brian Wolfe, G3MTR. ML&S and Arno Electronics kindly sponsored the second prize, an 80m EH antenna won by Rich Gelber, K2WR/MJ0AWR. He kindly donated it to the Jersey Amateur Radio Society. The raffle raised around £1,115, all of which will be used to support future HF DXpeditions. In addition, I would also like to acknowledge bhi, Diode Communications, F5KHW – Airborne Antennas, Icom (UK), Kenwood, KMK (MixW), Moonraker, RSGB Bookshop, Waters & Stanton, WH Westlake, WinRadio and some anonymous amateurs for donating some excellent prizes.

As is usual with any event, there are many people to thank who worked behind the scenes, often over many months and at the event, to make it all happen. I have personally thanked members of my organising committee, the RSGB HQ staff and the members of the Crawley ARC. Finally, we need to thank our presenters, for their time, effort and skill in making what many have said was the best HFC programme for years. ♦

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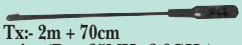

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2.9GHz). Tx:- 2m + 70cm

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NISSEI PWR/SWR METERS

@ LOWER PRICES!

RS-502 1.8-525MHz (200W) .....£69.95 P&P £5
RS-102 1.8-150MHz (200W) .....£49.95 P&P £5
RS-402 125-525MHz (200W).....£49.95 P&P £5
RS-3000 1.8-60MHz (3kW) Incls mod meter £39.95 P&P £5
RS-40 144/430MHz Pocket PWR/SWR .....£24.95 P&P £2
DL-30 diamond dummy load (100W max) ...£29.99 P&P £3

YAESU VX-2E

INCLUDES FREE WATERPROOF BAG

Tx:- 2m/70cm. Rx:- 0.5-999MHz. Includes battery (Li-/on) + charger.

OUR PRICE £115.00

Optional speaker microphone £27.99
Optional plastic case £12.99

ALINCO DJ-596

2m + 70cm Handie. Includes: (NIMH) Battery/Charger. Wide + narrow switchable. High power (4.5W) OP as standard. Alpha Numeric channeling.

Now includes free remote mic

£129.95

Optional case £16.99
Cigar lead.....£19.99
Optional headset (Boom mic) £24.99

KENWOOD TH-F7E

Transceiver & scanner 2m/70cm Tx (5W). Rx:- 0.1-1300MHz, all mode (incl SSB). Incls:- Lithium ion battery & charger.

Incl's free remote mic

OUR PRICE £229.99

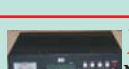
Optional case.....£19.99
Optional cigar lighter lead.....£19.99
Optional headset (Boom mic) £24.99

YAESU BARGAINS

FT-2800M...£149.99 incl's FREE antenna - mount req'd

ACCS

MFJ-993



NEW INTELLITUNER 300W, fully automatic. Will tune wires G5RVS, verticles, trapped dipoles, you name it.

NOW £209.99

MFJ-259B

UK VERSION

HF digital SWR analyser + 1.8-170MHz.

NOW £169.99 P&P £7.00

Optional case.....£22.99

MFJ-259Z Analyser.....Now £184.99
MFJ-269B 160-70cm analyser .....Now £259.99
MFJ-269B Optional Case £22.99
MFJ-66 DIP Coils (for analysers) £24.99
MFJ-901B Superb versitile ATU .....Now £72.99
MFJ-902 Travel tuner (10 - 80m).....Now £59.99
MFJ-1610 Random wire tuner (HF) .....Now £45.00
MFJ-264 (0-600MHz) 1.5kW dummy load £49.99
MFJ-260C (0-600MHz) 300W dummy load £30.00
MFJ-1118 Multiple DC outlet board.....Now £49.99
MFJ-1117 High current outlet unit.....Now £35.00

MFJ-949E

SPECIAL £110

- 1.8-30MHz 300W ATU
- Large cross needle meter
- 30/300W PEP power meter
- VSWR ● 3-way antenna selector
- Internal balun

MFJ-969

The world's only 300 Watt Aircore™

Roller-Coaster Inductor A.T.U.

(covers 160 meters to 6m). Handles almost any antenna + wires.

NOW £159.99

SGC-230

200W remote weatherproof ATU. Connect a wire and simply go! (Minimum length applies.)

£299.99

Smart Lock Special Offer (for SGC-230) £39.99
SGC-239 Mini Tower (1.8-30MHz) £169.99
SGC-231 HF + 6m £299.99

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box and 25m of rotator cable.

OUR PRICE £299.99

G-650C .....our price £359.99
G-1000DXC.....our price £449.99
G-5500 (azimuth/elevation) rotator .....our price £499.99
GC-065 thrust bearing.....£48.00
GC-038 lower mast clamps.....£25.00

AR788 *NEW MODEL*

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable 50p per mtr.

OUR PRICE £44.99

AE-201 thrust bearing £14.99

UBC-180XLT

A brand new state-of-the-art scanner with 8.33kHz spacing on airband. Covers 25-960MHz (with gaps). Includes battery and charger. 8.33kHz tuning. Back-lit display along with alpha-numeric tagging.

RRP ~~£129.95~~ OUR PRICE **£99.95**

GRE PSR-225

25-550/760-1300MHz. AM/FM/SF. VFO tuning/direct frequency entry/direct-limit search/auto frequency storing/anttenuator 240V or 12V. Was ~~£199.00~~

NOW **£149.99** Del £10.00

D-308B DELUXE DESK MIC

(with up/down). Many amateurs using this mic (over 4000) have expressed extreme pleasure with it's performance. Includes 8-pin round Yaesu mic lead.

£49.95 P&P £6.00

Yaesu	8 pin round to modular adapter (8 pin)	£19.99
Yaesu	8 pin round to 6 pin modular adapter	£19.99
A-08	8 pin "Alinco" round	£9.95
K-08	8 pin "Kenwood" round	£9.95
I-08	8 pin "Icom" round	£9.95
IM-08	Modular phone "Icom"	£9.95
KM-08	Kenwood modular lead	£9.95

HUNTER

Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

OUR PRICE **£39.95** P&P £6

Optional padded case £7.50

CUSHCRAFT BARGAINS

Delivery £12.00

MA5B	Mini beam 10, 12, 15, 17, 20m	SPECIAL OFFER	£315.99
A4S	4 ele beam (10 - 20m)	~~£599.95~~	£425.00
R-8	Vertical (40 - 6m) "special"	SPECIAL ~~£499.95~~	£299.99

CAROLINA WINDOM P&P £8.50

CW-160S	(160-10m) 40m long	NOW £110
CW-80	(80-10m) 40m long	NOW £79.95
CW-80S	(80-10m) 20m long	NOW £99.95

FIBRE GLASS POLES

Del £10.00

	1½"	1¾"	2"
1m	£8.50	£10.50	£12.50
2m	£16.00	£20.00	£24.00

Longer lengths available – phone

HHC-2 Police style holster

A unique "stretch case" designed to fit atatched to your belt or fixed to your body via the 3-point body harness (supplied). (Ideal for hand-held/mobile phones).

£10.00 P&P £2.50 2 for £15.00

New station log books (A4) £2.99 P&P £2.00
5 Logbooks £12.00 P&P £6.50

MFJ-126

Superb 12 hour quartz wall clock with 24 hour time line,

WAS ~~£29.99~~ Now **£14.99** P&P £5.00

TH-887 Icom/Kenwood

Superb headset for most handhelds. Supplied complete with an Icom or Kenwood 8-pin modular (specify) adaptor to fit Icom & Kenwood mobiles.

WAS ~~£43~~ Now **£25.00** P&P £3.50

COPPER ANTENNA WIRE ETC

Enamelled (50m roll)	£16.95 P&P £5
Hard drawn (50m roll)	£16.95 P&P £5
Multi-Stranded (Grey PVC) (50m roll)	£13.95 P&P £5
Flexweave (H/duty 50 mtrs)	£30.00 P&P £5
Flexweave H/duty (18 mtrs)	£15.95 P&P £5
Flexweave (PVC coated 18 mtrs)	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00 P&P £6
Special 200mtr roll PVC coated flexweave	£99.00 P&P £10
Copper plated earth rod (4ft)	£13.00 P&P £6
Copper plated earth rod (4ft) + earth wire	£19.99 P&P £6
New RF grounding wire (10m pack) PVC coated	£12.50 P&P £5

COAX SWITCHES (P&P £4.50)

2 way CX-201 (0-1GHz) SO239 ..... £19.95
2 way CX-201 'N' (0-1GHz) 'N' £24.95
4 way CX-401 (0-500MHz) SO239 .... £69.95
4 way CX-401 'N' (0-500MHz) 'N' £79.95

LOW LOSS PATCH LEADS

£3.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£5.99
PL-259 - PL-259	4m	£9.99
BNC - BNC	1m	£6.99

COAX BARGAINS

RG-213 Mil spec x 100m.
£59.99 or 2 for £100.00 P&P £10

RG-58 Mil spec x 100m.
£29.99 or 2 for £50.00 P&P £10.00

Coax stripping tool (for RG-58) ..... NOW £2.00

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. *Simply close shut over cables and notice the difference!* Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £10.00 or 6 for £25.00 (P&P £3.50)

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/OD35mm. 6 for £12.00
12 for £20.00 P&P £3.50
50 for £40.00 P&P 7.00

BARGAIN WINCH

500kg brake winch.
BARGAIN PRICE
£59.95 Del £8.50

Winch wall bracket £19.99

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast).

£8.99 + P&P £3.50

30m pack (4.4mm) nylon guy rope £12.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£8.99 + P&P £3.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on

WALL BRACKET **£2.99** P&P £1.00

MOBILE ANTENNAS

P&P £8.50

DB-770M	2m/70cm (3.5 - 5.8dB) 1m PL-259 (SO-239)	£24.95
DB-7900	2m/70cm (5.5 - 7.2dB) 1.6m PL-259 (SO-239)	£39.95
DB-627	6m/2m/70cm (2.15 - 4.5 - 7.2dB) 1.6m (SO-239)	£39.99
DB-285	2m/5/8ths (3.4dB) 1.3m (SO-239)	£10.00
PL-62M	6m + 2m (1.4m) PL-259	£21.99
PLT-20	20m mobile whip (56" long)	£24.95
PLT-40	40m mobile whip (64" long)	£24.95
PLT-259	Converter for PLT Range(PLT-40/20)	£5.95

ALL 'DB' ANTENNAS HAVE FLIP OVER FACILITY

METAL WORK & BITS

P&P available on request

Phasing Harneses Now In Stock.

2.4m/2" alloy poles		£19.99
2"	Mast base plate	£12.95 P&P £5
6"	Stand off	£6.95 P&P £5
9"	Stand off	£8.95 P&P £5
12"	T&K Brackets	£18.00 P&P £8
18"	T&K Brackets	£22.00 P&P £8
24"	T&K Brackets	£26.00 P&P £8
U bolts (1½" or 2")		£1.20 each
8 nut universal clamp (2" - 2")		£5.95
2" - 2" cross over plate		£10.95
3-way guy ring		£3.95
4-way guy ring		£4.95
2" 3-way rotary guy ring		£29.99
2" mast sleeve		£9.95
Heavy duty guy kits (with wire)		£29.95 P&P £6
Ground fixing spikes (3 set) powdered coated		£24.00 P&P £8
30m pack nylon guy 4.4mm/B/load 480kg		£12.50 P&P £3
132m roll nylon guy (4.4mm)		£40.00 P&P £7.50
Self amalgamating tape (roll)		£6.50
'Nylon' dog bone insulators		£1.00 each
PL-259 plugs (large or small entry)		£1.10
N-type plugs (large or small entry)		£3.95

DIAMOND CP-6

A superb (diamond quality) 6 band trap verticle antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m

SEND SAE FOR DATA SHEET

OUR PRICE **£219.99**

Q-TEK PENETRATOR

"WE'VE SOLD 100S ALL OVER EUROPE"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

ONLY **£179.95** Del £10.00

SEND SAE FOR LEAFLET

DELUXE G5RV

P&P on either full/half size £6.50

Multi-stranded heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings.

Double size - 200ft (160-10m) £84.95
Full size - 102ft (80-10m) £42.95
Half size 51ft. (40-10m) £36.95

Inline (SO-239) line isolator (a must for G5RV's)...NOW £29.99

STANDARD G5RV

Full size 102ft (now includes heavy duty 300Ω ribbon).... £28.95 P&P £6
Half size 51ft (now includes heavy duty 300Ω ribbon)..... £24.95 P&P £6

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end) ..... £25.00 P&P £4.00 (a pair)

G5RV PARTS

Open wire dipole centre	£5.99
SO-239 dipole centre	£5.99
SO-239 to 300Ω joiner	£9.99
300Ω ribbon (Extra heavy duty)	50p/mtr

Q-TEK COLINEARS (VHF/UHF)

P&P £10.00

X-30 GF 144/70, 3/6dB (1.1m)	£39.95
X-50 GF 144/70, 4.5/7.2dB (1.7m)	£54.95
X-300 GF 144/70,6.5/9dB (3m)...	SPECIAL OFFER £45
X-510H GF 144/70, 8.5/11dB (5.4m)	£120.00
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)	£79.95

BALUNS & TRAPS

1.1 Balun	1kw Handling	£25.00 P&P £4
4.1 Balun	1kw Handling	£25.00 P&P £4
6.1 Balun	1kw Handling	£25.00 P&P £4
40 mtrs Traps	1kw Handling	(a pair) £25.00 P&P £4
80 mtrs Traps	1kw Handling	(a pair) £25.00 P&P £4
20 mtrs Traps	1kw Handling	(a pair) £25.00 P&P £4

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2"/2" in diameter and finishing with a top section of 1"/4" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 8 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs **£109.95** 12 mtrs **£149.95** *Carriage £12.00.*

Tripod for telescopic masts £89.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF £20.00
DC-2 Standard 2-pin/15A fits most VHF/UHF £10.00

BARGAIN ALUMINIUM POLES

2.4m x 2" aluminium pole. £19.99 each
(del £10.00) or 4 for £50 (del £15.00)

BARGAIN MAST SET

5 section 16ft long (1⅛") mast set **£15.00**
Del £10 (2 sets £25.00)

TWO FOR £25

NEW 20' SLEEVED MAST SET

A heavy duty-sleeved, mast set that will tightly slot together. 4 x 5' (2" dia) 16 guage heavy duty aluminium tubes. (Dimensions approx).

£49.99 Del £10.00.

THREE FOR £100 DEL £150

ALUMINIUM POLE CLEARANCE

We have sets of 4 (2") poles (3 of which are swaged) that slot together to make a (approx) 20' pole. Each section is approx 5' long – some have small dents in – some have been swaged slightly off centre – hence the price.

3 FOR £40.00 DEL £15.00 **£15.00** Del £10.00

Andy Talbot, G4JNT

15 Noble Road, Hedge End, Southampton SO30 0PH.

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

Even more data modes!

Quite a lot to report on data comms this month, beginning with hurricane Katrina relief and ALE...

Automatic Link Establishment techniques were reported in this column in April 2000, where G4GUO developed software for the soundcard so the technique could be adopted for use with any amateur transceiver. Charles's software was taken up commercially, and it has been reported that a later version incorporating a GPS position-reporting protocol was used for emergency communications in Gulfport, between Biloxi and New Orleans, for the relief efforts after hurricane Katrina. See the 'Web Search' box for more details, but the web page says "....has led to the development of an open (non-proprietary) standard for an ALE Geo Position Report or ALE-GPR. To make the ALE-GPR 'universal' for ALE transceivers and controllers, the GPR is contained within an AMD message. There is still ongoing discussion about how to configure the default and options for the GPR, and what types of calls are to be used. Comments, proposals, and questions are welcomed on the HFLINK group."

CHIP 64

Another HF data mode has appeared from the stable of Nino Porcino, IZ8BLY, who already has several data mode software packages to his name. These latest ones, Chip64 and Chip128 are spread-spectrum modes for HF that attempt to overcome the difficult propagation issues associated with HF data communications. Chip64 / 128 work by assuming the 30 bits-per-second of normal typing speed. Each character is mapped to a different pseudo-random sequence of length 64 (or 128) chips sent at a speed of 300 baud Differential-BPSK (D-BPSK). The spreading codes are Walsh-Hadamard which contain a full set of 64 mutually orthogonal codes – ideal for transmission of an alphabet of 64 characters, and already used in the MT63 mode from the same author. By despreading these codes in the receiver software, a robust datamode results. Receiver setup and tuning is made user friendly by the CorrelScope which graphically displays the correlator results, screen-shots of this for two different cases of propagation errors can be seen in **Fig 1**. Details are available from Nino's website.

OLIVIA

The modulation layer default mode of Olivia has a multi-FSK waveform, the default mode of which sends 32 tones within a 1000Hz audio bandwidth; these are spaced by 31.25Hz and are shaped to minimise the amount of energy sent outside the nominal bandwidth. Tones are sent at 31.25 baud or every 32ms. The phase is not preserved from one tone to the next – instead, a random shift of ±90° is introduced in order not to transmit a pure tone when the same symbol is repeatedly sent. As the symbols are smoothly shaped, we do not need to keep the phase continuous, which is normally the case when no (eg square) shaping is used. Modulation adopts the Gray code to encode 5-bit symbols into the tone numbers. The waveform generator is based on an 8000Hz sampling rate, the tones being spaced by 256 samples in time and the window that shapes them is 512 samples long. Demodulation is based on a 512-point Fast Fourier Transform (FFT) and as the tone spacing frequency is 31.25Hz and the demodulator FFT has the resolution of 8000 Hz/512 = 15.625Hz, each bin of the FFT is exactly half the tone separation. To adapt the system to different propagation conditions, the number of tones and the bandwidth can be changed with the time and frequency parameters proportionally scaled. The number of tones can be 2, 4, 8, 16, 32, 64, 128 or 256. Bandwidth can be 125, 250, 500, 1000 or 2000 Hz.

Olivia includes Forward Error Correction (FEC). Each one of the 32 tones constitutes a symbol that carries five bits of information. For the FEC code, 64 symbols are taken to form a block and within each block, one bit out of every symbol is taken to give a 64-bit vector coded as a Walsh function. Every 64-bit vector represents a 7-bit ASCII character, thus each block represents five ASCII characters.

This way, if one symbol (tone) becomes corrupted by the noise, only one bit of every 64-bit vector becomes corrupt and the transmission errors are spread uniformly across the characters within a block.

The two layers (MFSK + Walsh function) of the FEC code can be treated as a two-dimensional code; the first dimension is formed along the frequency axis by the MFSK itself, while the second dimension is formed along the time axis by the Walsh functions. The two-dimensional arrangement was made with the idea in mind to solve such arranged FEC code with an iterative algorithm – however, no such algorithm was established to date. Scrambling and simple bit-interleaving is applied to make the generated symbol patterns appear more random and with minimal self-correlation; this avoids false locks at the receiver. The Walsh function for the first character in a block is constructed from the 1st bit of the 1st symbol, the 2nd bit of the 2nd symbol, and so on. The 2nd Walsh function is constructed from the 2nd bit of the 1st symbol, the 3rd bit of the 2nd symbol, and so on. The Walsh functions are scrambled with the 64-bit pseudo-random sequence 0xE257E6D0291574EC. The Walsh function for the 1st character in a block is scrambled with the scrambling sequence, the 2nd Walsh function is scrambled with the sequence rotated right by 13 bits, the 3rd with the sequence rotated by 26 bits, and so on.

FIG 1

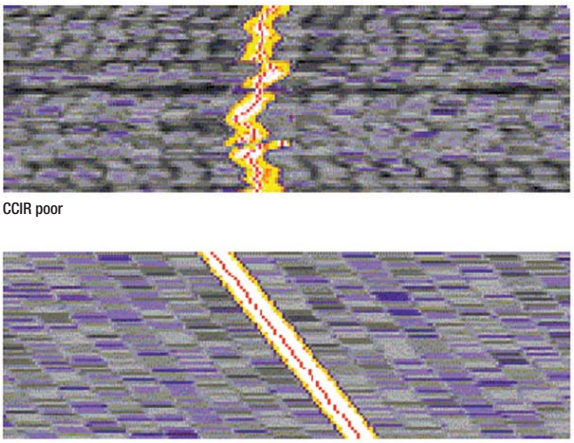


Fig 1: The CorrelScope display from the *Chip64* software by Nino Porcino, IZ8BLY.

AND FINALLY, BACK HOME...

The BARTG RTTY Sprint Contest takes place in January. The idea of a sprint contest is to go as fast as you can and make as many contacts as you can in a fixed period. The BARTG website does not yet carry details of the 2006 event, but these should not change too much from those for 2005 which *are* given. All DXCC countries and JA, W, VE and VK areas count as multipliers. Multipliers and continents count only once in the contest regardless of band. Scoring is QSO points x multipliers x continents (maximum 6). ♦

WEB SEARCH

ALE	http://www.hflink.com/alegpr/
Chip64	http://xoomer.virgilio.it/aporcino/Chip64/index.htm
Olivia	www.arrl.org/FandES/field/regulations/techchar/olivia.html
BARTG	www.bartg.demon.co.uk/

Rev George Dobbs, G3RJV

St Aidan's Vicarage, 498 Manchester Road, Rochdale OL11 3HE.

E-mail: g3rjv@gqrp.co.uk

QRP

More news from the QRP front, including two items of QRP portable successes, and two QRP events to look out for in the near future

Peter, US1REO, and Victor, US1RCH, have sent me information about the Ukrainian QRP Club Outdoor Day held on 6/7 August this year. This was the second such event. The operators (UR5RDX, UR5RJU, US1RCH, US1REO and US5RCW), of the club radio station UR4RWR/P, set up their camp on the bank of the picturesque Desna River in the Chernihiv region. A mast was erected to which was fixed a 4-element Yagi for 144 and 430MHz, as well as a long wire and delta loop for 14MHz. The club members declared the day a great success in spite of a thunderstorm and heavy rain.

The group made use of a NorCal-20 transceiver from a kit donated by the Northern California QRP Club and the G QRP Club. Some of these transceiver kits are still available. If you know of radio amateurs or, better still, a radio club in a poor part of the world that needs equipment, please contact me at the address above.

THE 'UNICHIP' GOES PORTABLE IN THE USA

The 'Unichip' is a single IC transceiver for 80m described in *SPRAT*, the journal of the G QRP Club, by the late Mike King, G3MY. It uses the five transistors in the CA3086 transistor array (one for a crystal oscillator, one as a transmit pre-amp, and three for receiver audio amplifier stages). Recently, a version was built by Hans Summers, G0UPL, and documented on his website **www.hanssummers.com/radio/unichip/index.htm**

Hans did not have any success with the original VN66 PA, so built his own using an IRF510 and got 2W RF output. Hans first tested the transceiver at Box Hill in Surrey and had two contacts on 80m, with G4LAM and G3CWW. The receiver is direct-conversion and has no CW filter, no unwanted sideband suppression and not even a volume control, but Hans reported that it sounds really beautiful; there is no trace of broadcast breakthrough and the lack of facilities is hardly noticeable.

Hans decided to take the Unichip with him on a business trip to the eastern United States. He describes the trip in his own words: "I put the as-yet uncased Unichip in my main (not cabin) baggage in a small cardboard box also containing a screwdriver and wire cutters which I view as my essential toolkit. I also packed my homebrew ATU and 10m of speaker cable (to be split to make 20 metres) and left a note on top saying "homemade ham radio transceiver – contains no batteries". I had no security problems.

"On Tuesday evening I tied one end of the antenna around a small bottle of mineral water I found in the fridge in my room, and threw it at the tree outside my window on the upstairs floor of the two-storey building. I taped eight D-cell batteries from my office in the front page of the *New York Times* to make my 12V battery pack. I put out several CQ calls, but had no replies. I knew the ATU wasn't tuning well, but tried anyway. I was using a wire taped to the radiator as my earth.

"On Wednesday evening, I took a PC power cord from my office and cut off the PC-end plug, to access the earth wire and use it as my earth connection. I also 'borrowed' a network cable from my office and dismantled it into four lengths of wire which I added to my antenna, increasing the length to about 32m, though not particularly high up; perhaps 5m at the highest point. I investigated the ATU and found that the tuning capacitor has developed a faulty connection. By some hard squeezing I was able to make it connect and tune the antenna system very close to 1:1.

"I proceeded to have three hours of back-to-back ragchews and followed with another 2.5 hours on Thursday evening. Over the two evenings, with my 2W QRP signal on 3558kHz, I worked W1GUE, K1ARO, W3MNE, W1CFI, N2EY, AF4K, K4JYS, AE5X/2, and W2LJ. Brian, AF4K, in Florida reported 339 at his distance of about 1500 miles! Not bad for 2W and such a basic setup. My friend Arv, K7HKL, reported via e-mail hearing my signals weakly in Idaho right over the other side of the USA!

"I should mention that if any of you are worried about the PC power cord, network cable and 8-pack of D-cell batteries that were provided by my employers, don't worry! They profited greatly from the fact that I was so excited by all the radio activities that on all three evenings I forgot to order any food! My expenses claim will therefore be that much smaller!

"As I write this, I have just seen the sun setting over the Manhattan skyline as we drove past, and then passed a great big New York Times building where from the looks of it, the newspaper is printed and distributed. I thank them for their newspaper, I didn't read a single word of it, but the front page certainly came in very useful! I'll be back and will definitely bring a homebrew radio with me. Those who have never tried operating away from home, try it! It's great fun. A big thank-you to all the friendly gentlemen I enjoyed meeting on 80m CW during my stay in America and who made me feel so welcome on their airwaves."

THE 22ND YEOVIL QRP CONVENTION

The annual Yeovil QRP Convention for 2006 is to be held on Sunday 9 April at the Digby Hall, in Sherborne, Dorset. The event is open from 10am to 5pm. The Yeovil convention has built up a reputation for interesting speakers and a fascinating collection of stalls selling components, kits and surplus items.

The convention speakers and their subjects for 2006 are:

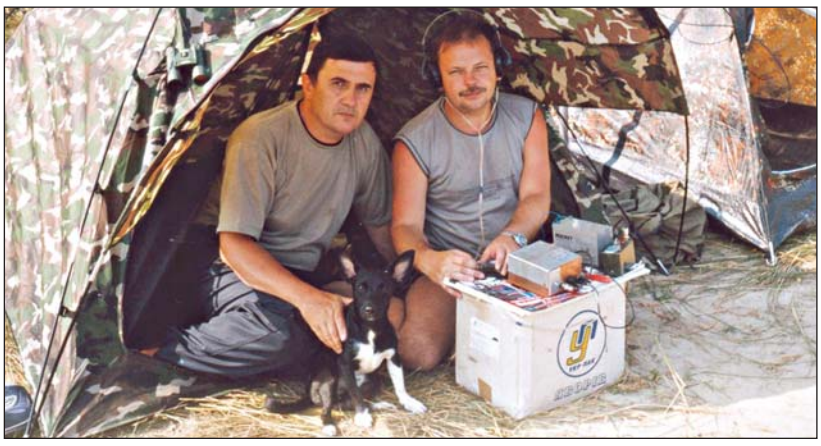
- 10.45am 'Quantifying Grey-Line Propagation', by Rob, G3MYM
- 12am 'Chippenham DARC Mini DXpedition to Lundy', by Ian, G0GRI
- 1pm lunch break & draw
- 1.30pm an additional lecture, TBA.

For more information, contact George Davis on 01935 425 669, or e-mail george@mudford.fstnet.co.uk.

THE G QRP CLUB WINTER SPORTS

The G QRP Club Winter Sports is one of the most popular QRP operating events. Each year between Boxing Day (26 December) and New Year's Day (1 January) the club invites any operators to join in a QRP 'QSO Party' using 5W of RF output or less. The operating takes place on and around the International QRP Calling Frequencies. These are: CW – 1843, 3560, 7030, 10,106, 14,060, 21,060 and 28,060kHz; SSB – 3690, 7090, 14,285, 21,285, 28,360kHz.

The Winter Sports is not a contest, although it is usual for each operators to exchange his G QRP Club membership number if relevant. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Peter Barville, G3XJS, 26 Hever Gardens, Bickley, Bromley, Kent BR1 2HU (g3xjs@gqrp.co.uk). The G4DQP Trophy is awarded to the station making the best overall contribution, which may not be the station with the most contacts or working the most DX. So turn down the power and have a try at this popular event. ♦



Operating on the Ukrainian QRP Day with Peter, US1REO, Victor, US1RCH, and QRP dog, Max.

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Antennas

This month, Peter looks at the practical use of the tunable RF current meter, and explains why you needn't be too concerned that every metallic object in the house appears to be radiating!

In a recent letter in 'The Last Word', Peter Ball, G3HQT, described how he had built the Tunable Magnetic Field Strength Meter, as described in *The Antenna Experimenter's Guide*.

By using this meter, he discovered that not only was there RF current on the antenna elements, but also on the outside of the coax feed. He also found RF current on the support post, leads from the transmitter, TV aerial, mains wiring, water pipes, the hot (water) tank, gas pipes, the sink draining board – in fact, every metallic object around the house. As the antenna appeared to be working OK he asked if he should worry about it.

This really emphasises the actual situation regarding an amateur radio antenna installation. Because many garden plots are small, much of the electrical and plumbing hardware is within the near field of the antenna. As long as the currents in these metal objects are relatively small compared to the current flowing in the antenna elements then they should not have much effect. If any one of the currents is much higher, due perhaps to the metal object being close to the resonant frequency of operation, then this might be cause some disturbance of antenna performance. Current may be flowing in telephone and power lines as well. All of these RF currents may have an influence on antenna patterns, or can be of significance in the case of RFI.

TUNABLE CURRENT METER

The tunable current meter is simply a tuned circuit with a diode detector and a meter. This useful little instrument is truly a junk-box project where the main components can be salvaged from an old transistor radio. The main component is the variable air-spaced capacitor from an older transistor radio. The other component is the ferrite rod. The original windings are removed from the rod, although the cardboard coil former can be retained.

The instrument is built into an aluminium box. Any non-ferrous metal is suitable provided it shields the detector circuit from the electric field of the electromagnetic wave and does not impede the magnetic component of the wave. A slot is cut with a hacksaw across the top and filed smooth with a thin file. This slot is needed to prevent the box acting as a shorted turn.

The ferrite rod is supported by rubber grommets fitted in holes in the metal enclosure at the ends of the slot. This slot must be cut with a hacksaw from the front to the back of the box, and a thin file may be used to smooth the cut.

By chance, I had recently modified my tunable current meter described in *The Antenna Experimenter's Guide*. The original used 12 turns of thin insulated wire, wound on the ferrite rod and tapped four turns from the earthed end. This gave a frequency range of 5 – 18MHz when tuned with a 250pF (value guessed at) capacitor.

I needed a greater frequency coverage, so some sort of band-switching was necessary. The circuit shown in **Fig 1** is based on the design found in all recent editions of the *ARRL Antenna Book*. The coil windings and expected frequency coverage, when C1 is 140pF, are as follows.

L1 30 turns, tapped 3 turns from earthed end. (1 to 8.5 MHz)
L2 8 turns, tapped at 2 turns from earthed end. (5 to 20 MHz)
L3 2 turns, tapped at 1 turn. (17 to 39MHz)

A larger value of C1, that might be found in an old transistor radio, will give a greater frequency range on each band. The characteristics of the ferrite rod will vary from one transistor radio to another and this will affect the frequency range.

USING THE PROBE

The instrument is very useful for checking the current distribution in antenna elements. In measuring the current in a conductor, the ferrite rod should be kept at right angles to the conductor, and at a constant distance from it. It is also useful for measuring RF ground currents in radial systems. A buried radial may be located easily by sweeping the ground. Current division at junctions may be investigated. Areas of high current in existing radials may indicate where additional radials might be effective.

Stray currents in conductors not intended to be part of the antenna system can be investigated. As stated earlier it is not unusual to find RF currents in all metal structures and services around the house and most of these cannot be avoided. If you come across a conductor that is radiating a higher-than-average current, it may be possible to reduce the current by bonding or changing the physical length. I have even used this method for detecting electrical wiring and plumbing pipes embedded in the wall before drilling holes to put up a shelf, although I must warn that the technique may not be infallible. ♦

The tunable current meter being used to measure the current in a buried radial. This instrument is built in a 100mm x 100mm x 65mm aluminium box. The tuning control and indicator is calibrated with just some of the amateur frequency bands.

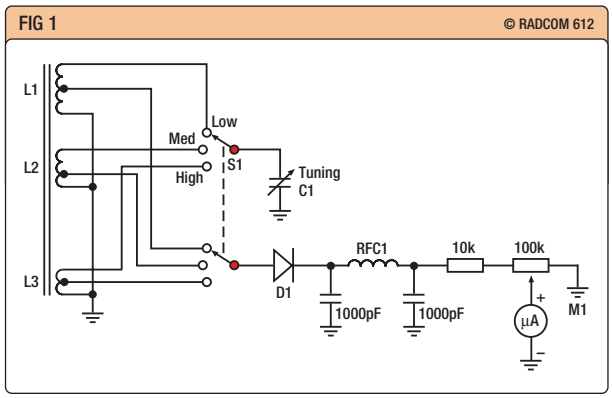


Fig 1
Circuit diagram of the Tunable Magnetic Meter.

EMC

This month's column includes further information on ADSL installations and more on noisy switch-mode power supplies.

Items in October 'EMC' and previous columns about Asymmetric Digital Subscriber Line (ADSL) and home computer networks have generated quite a lot of interest. It seems that many members and their neighbours have recently started using ADSL for broadband Internet access. In some cases, network switches/routers are also used to allow multiple computers to share an ADSL connection.

WIRELESS MODEM/ROUTER RFI

Wireless routers are becoming popular for home computer networks using the IEEE802.11g standard. This standard uses wireless transmission in a licence-exempt band at 2400 – 2483.5MHz. The lower part of this range overlaps the top of the 13cm amateur band (2305 – 2450MHz), but the actual wireless LAN transmissions should not affect any amateur radio bands apart from the 13cm band. Nevertheless, some EMC problems have been reported on HF due to such things as noisy switching regulators.

David, G4HMC, reports that, since February 2005, he had suffered with broad-band interference apparently centred on the 3.5MHz band, but affecting 1.8MHz and 5MHz to a lesser extent. The interference was frequency-agile occupying a 20kHz bandwidth repeated every 50kHz and approximately 40dB above general band noise which is typically S2 – 3 at his location.

As most of David's operating is on 3.5MHz, with a fair proportion of QRP working, the interference was a real problem David's initial investigation using a Racal 'Minical Packset' revealed interference radiating from his BT telephone line, which passes under and in fairly close proximity to his HF doublet antenna.

David duly contacted the local BT office who referred the case to BT Transmission Technical Support. The source of the interference was eventually traced to a wireless modem and router and subsequently, David was able to contact the near neighbour who had installed the device which has now been changed. The full description of the device in question is the Belkin F5D7633-4 ADSL Modem with High-Speed Mode Wireless-G Router. This has been replaced with a BT Voyager 2100 unit, which appears to be absolutely clean on all HF bands. David says that he must give full marks to the BT staff who, in a highly professional manner, assisted him in solving this interference problem.

John, G3UUT, has provided some useful information and pictures on tackling interference from a Netgear DG834G ADSL modem and wireless router (see photo). He particularly went for an ADSL modem with wireless LAN as it potentially eliminates any interference from a wired local area network in the house. In this respect it has been successful, but he found that it produced severe interference between 3.6 – 3.8MHz. The interference originates in a switching regulator inside the modem/router. Fortunately, the 'wall wart' PSU that plugs into the wall contains only an iron-cored 50Hz transformer and the 3.5MHz interference was originating inside the modem and being radiated from the DC power lead.

John warns that to remove the case of the modem/router it is necessary to remove two screws under the plastic information label on the bottom and it is nearly impossible to remove these without damaging the label. The power supply section is simply a bridge rectifier and large electrolytic smoothing capacitor feeding various switching regulators. It appears that the electrolytic does not have a low impedance at 3.7MHz and the small surface-mounted ceramic capacitors across it and on the power input either have too little capacitance or are resonating with the self inductance of the electrolytic.

John reports that the cure is simple, a small 0.15µF capacitor wired directly across the bridge rectifier (+) and (-) pins as shown in the photo. This reduces the interference by an enormous amount and is thin enough to go between the PCB and the case (see photo).

TELEPHONE EXTENSION WIRING WITH ADSL

Roger, G3YBO, has had broadband since February 2005. He reports that, from day one, he got high levels of noise on the 3.5 – 3.8MHz band and, if he transmits with 100W, the ADSL broadband service stops working. He has a Netgear Router which has a CAT5 UTP cable direct to the BT master socket. The master socket has two outputs for ADSL and phone. Roger asks when the new BT face plate mentioned in October 'EMC' is available. The answer may be that he has one already.

David, G3YYD, provides details of obtaining a replacement face plate for the BT master telephone socket. He used this to solve his ADSL immunity problem. It has the ADSL splitter built in and it has a normal phone socket and a ADSL socket on its face. The phone socket and the extension wiring are isolated from line by the filter and also from the ADSL socket. John found that the faceplate splitter was very easy to fit and it also improved his ADSL signal to noise ratio. It is available from Solwise for £11.79 + p&p (Stock code ADSL-FACESPLITTER), or from Farnell Components for £11.75 + p&p + VAT (order code 5060229). See also 'Web Search'. On the Farnell website, this item is listed as an ADSL Central Filter/Splitter made by Pressac and the manufacturer's data sheet can be downloaded.

BROADBAND OVER POWERLINE (BPL)

Arthur, G3RZV, read *Computer Active* magazine, issue 197 (1 – 14 Sept 2005). The cover story was a feature on broadband and, in a section headed 'On the horizon', there was reference to "Broadband over power lines – a long-promised technology that has yet really to deliver". Arthur e-mailed the editor with a critique of the EMC aspects of this technology and *Computer Active* printed a shortened version in the 'letters' page of its issue 199.

13.8V SWITCH-MODE POWER SUPPLIES

Don, G3HVA, has sent a copy of a letter that he wrote to a supplier of amateur radio equipment. Don says that he is very impressed with the Icom 756PROIII transceiver that be purchased recently, but he cannot

David Lauder, GOSNO

20 Sutherland Close, Barnet EN5 2JL.

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

praise the Mydel MP-250A switch-mode power supply unit (PSU) that he also purchased. Don reports that, although the PSU has all the positive attributes specified in the sales advert and extremely low fan noise, it radiates considerable RF interference on the lower amateur bands, in particular in the 1.8, 3.5MHz and 7MHz bands.

As a corresponding member of the EMC committee, Don tries to ensure that every feature of his station provides optimum EMC performance. The entire antenna system is reasonably remote and centre-fed, using 75Ω coaxial cable and twin feeder, so when Don first used the Mydel PSU with the new transceiver, he did not notice anything untoward. However, he uses an MFJ interference canceller from time to time to eradicate QRM from a nearby Sky television system that radiates interference on the lower HF bands. This works by using signals from a second antenna to cancel interference picked up by the main antenna. Careful adjustment of the canceller is required to achieve cancellation and it can only cancel one interference source at a time. As soon as Don switched on the MFJ unit, he became aware of unstable S9+ peaks every 30kHz or so on the lower HF bands. These originated from the Mydel PSU in his shack and could not be cancelled out. They dropped to about S5 on average with the MFJ unit out of service.

Don tried "every trick in the book" to eliminate the interference with the MFJ unit in operation, but to no avail. In fact, a separate earth connection to the rear terminal of the Mydel MP-250A PSU even caused an increase in the QRM level. A probe was used to detect the points of harmonic leakage, and the highest levels were noted around the right-hand meter (looking from the front), the mains lead and the 13.8V negative lead.

Don returned the Mydel PSU for a refund, which he was given without question but after four weeks, he is still waiting for a reply to his letter. Don's previous PSU is a Palstar PS30-M linear type. It is large and heavy but it is quiet at RF although he considers that the fan is too noisy on full load.

ELECTRIC FENCES

Peter Martinez, G3PLX, lives in a rural location and doesn't get much in the way of EMC trouble, but occasionally the neighbouring farmer deploys an electric fence nearby. Peter knows about this because it "creates a terrific racket, a loud pulse repeating at intervals of about 1.6 seconds, over the whole LF, MF, and HF spectrum."

Peter first suspected the RFI source to be the high voltage pulse generator, a well-known 'Electric Shepherd' device and attempted (with the agreement of the farmer) to fit a suppressor. An inductor in series with the pulse output terminal had no effect at all. He discounted completely any idea of a shunt capacitor. The only thing that seemed to work was a high value resistor but it didn't work every time. Sometimes it was completely clear and sometimes it was bad again. There was clearly something that he didn't understand about the mechanism. In any case, he couldn't be certain that the resistor wouldn't lower the pulse voltage and render the fence ineffective.

Then he had a breakthrough. The farmer had set it up one day (without the resistor) and it was making its noise. Peter was resigned to having to tolerate it for a few days, when it started raining and the noise stopped suddenly and completely, only to re-appear again the following (sunny) day. To cut a long story short, Peter found that the noise was *not* coming from the pulse generator unit itself but from spark gaps at breaks in the wires that form the fence. The fence 'wire' looks like a white plastic tape into which several longitudinal stainless steel wires have been woven. At places where this tape had been knotted or frayed, one or more of these strands can become disconnected, and it is quite possible for there to be several breaks in a long length of well-used fence tape. A spark between two strands generates the RF pulse, which is then radiated by the wires each side in a dipole mode. Clearly what was happening in the rain was that the wet tape ensured that there was always a low-resistance path across any gaps.

The sparks are audible, so the cure is to walk along the fence listening for sparks and noting where they are, then to switch off the pulse generator and make repairs. Peter just wound a bit of tinned copper wire over the affected length, but a proper job might involve cutting out frayed bits and checking for continuity across any new knots introduced. Peter then recommends reconnecting the battery, checking that the sparks have gone and that there are no new ones elsewhere along the fence, then returning to the shack to see if the noise has gone.

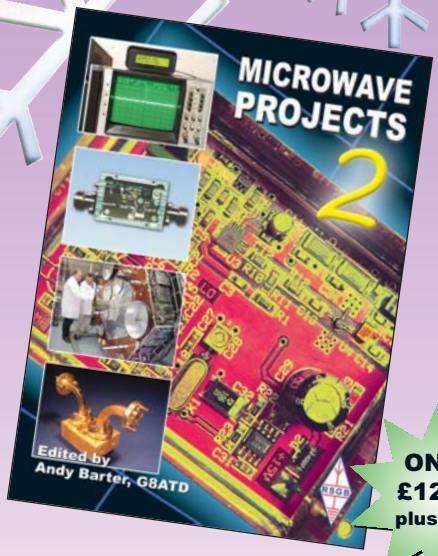
Other members who have investigated RFI from electric fences have found the cause to be sparking where the fence wire is touching vegetation or where an insulator is faulty or missing. Searching in the dark to find the sparking has been suggested, while taking care not to touch the electric fence by accident! ♦

The Netgear DG834G ADSL modem and wireless router belonging to G3UUT.

Modification to a Netgear DG834G ADSL modem and wireless router to reduce RFI on the 3.5MHz amateur band.

WEB SEARCH

Solwise ADSL Faceplate Splitter
www.solwise.co.uk/adsl_splitters.htm
Farnell ADSL Central Filter/Splitter, Order Code 5060229
www.farnellinone.co.uk



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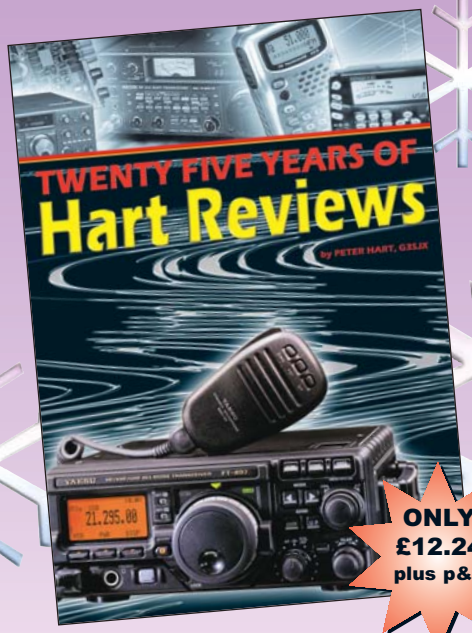

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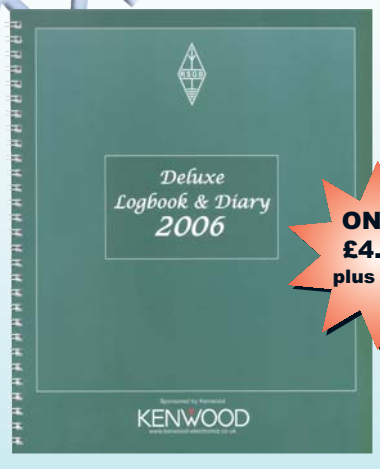

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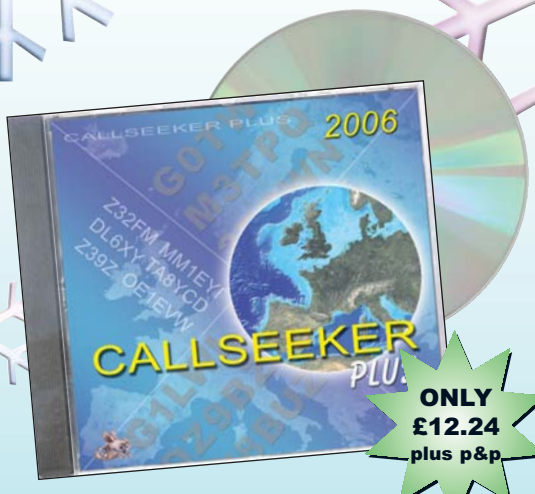

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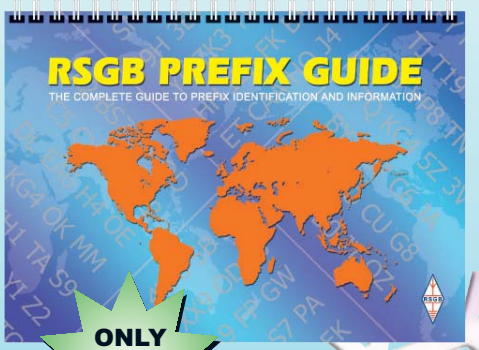

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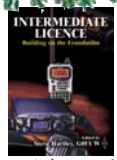

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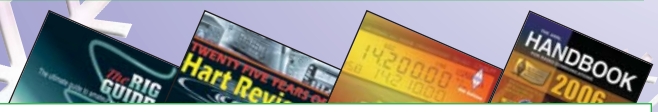

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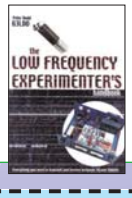

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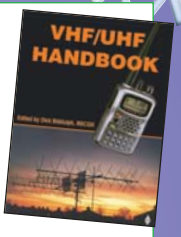

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TT

Supermodes – chordal hop, grey-line & TEP ♦ New steps in variable-width crystal filters ♦ Keeping the PA working

SUPERMODES - CHORDAL HOP, GREY-LINE & TEP

It might seem that, by now, just about everything must be known and understood about the vagaries of HF/VHF long-distance propagation of our radio signals. Yet, as any account of the past 60 years would underline, we continue to be surprised at what can sometimes occur. We tend to forget that classic propagation lore tends to be tied largely to high-power broadcasting and HF point-to-point professional or military links. Professional communicators, unlike radio physicists and radio amateurs, are seldom concerned with anomalous propagation that occurs only fleetingly and rarely and cannot be relied upon for traffic handling. As alternative forms of global communications - satellites, wideband cables, Internet etc - take over the role once occupied by HF point-to-point radio, the physicists research microwave rather than HF propagation. Investigation into HF antennas and anomalous propagation is increasingly being left to radio amateurs.

It seems a pity that so many of the introductory texts and articles in our journals on HF propagation still suggest that HF transmission at distances over 2500 miles depends on multiple hops between the earth and the F2 ionospheric layer. The significant attenuation of one or more ground reflections is largely ignored. Attenuation of reflections from the oceans is much lower, but there is reasonable evidence that most lowish-power amateur DX contacts over paths exceeding about 4000 miles are actually single-hop paths at close to or above the MUF, using what are generically called supermodes.

Chordal hop, long path (LP), grey-line, round-the-world (RTW) echoes and transequatorial propagation (TE or TEP) are all good examples of supermode propagation.

HF RTW echoes were first observed in the late 1920s. During WWII, German scientists developed a form of long-distance direction-finding from a single site by measuring the difference in times of arrival of direct and long-path (LP) signals, noting the consistency of LP signals. Soon after the war, the German radio-physicist and radio-amateur, Hans Albrecht, DJ2JR, operating as VK2AOU in Australia, noted the reliability of signals from Europe. He became convinced that this was due to single-hop transmission, and coined the term 'chordal hop'. This work was noted by the late Les Moxon, G6XN, publicised by 'TT' in the UK, and exploited by Les in connection with his own work on radiation at extremely low vertical angles. G6XN showed how, from suitable locations, reliable contacts could be made with VK when operating portable with powers of around 3W. Broadcaster investigations soon showed that optimum signals in Europe from Australian HF broadcasts were better and more reliable at around 10MHz than on the higher broadcast bands predicted by conventional theory. Again, this was found to be primarily due to single-hop, chordal hop propagation.

It also soon became clear that long-distance contacts could be made at modest power and with modest antennas on the 1.8 and or 3.5MHz bands by utilising the so-called 'grey-line' that exists, if only briefly, between locations situated along the boundary between day and night and where sun-rise and sun-set coincide. Interestingly, it has been shown that, at these times, relatively low-dipoles can sometimes perform as well as or better than vertical antennas designed for low-angle radiation.

In the early post-war period, amateurs soon found that 50MHz DX contacts could be covered in a north-south direction at times when even the extremely high sunspot maximum of 1947 could not readily account for them. These contacts seemed to be largely confined to stations located on opposite sides of the Equator, provided that the stations were neither too far North nor too far South. This soon became known as transequatorial propagation (TE or TEP).

'TT', January 1971, carried the following notes, based on a letter received from Oliver P Ferrell, the then editor of the American *Popular Electronics*, putting the historical significance of TE in perspective: "The first scientific notice of this radio amateur discovery appeared in the British publication, *Nature*, Vol 167, p811 of 19 May 1951, in my letter 'Enhanced Trans-Equatorial Propagation Following Geomagnetic Storms'. Several weeks earlier, I had given a paper at the Washington, DC, meeting of URSI titled 'Very High Frequency Propagation in the Equatorial Region' (abstracted in *Proc IRE*, June 1951, p719). The Washington paper gave the scientific community a chance to comment on this radio amateur discovery and, from that point, you will find a gradual building of intense interest."

'TT' included from Oliver Ferrell's Washington paper a diagram ('TT' January 1971, p30, Fig 8) providing a chart of the original amateur observations on 50MHz transequatorial propagation, based on the path between Buenos Aires and Mexico City (a path length of 4450 miles). It showed the concentration of openings around the equinoxes. The data was obtained from participating radio amateurs in a three-year 50MHz data gathering project, for which Ferrell was project supervisor, subsidised by the US Air Force.

It took a few years for amateurs to convince the 'professionals' that, in TEP, they had discovered something quite remarkable, not readily explainable by conventional theories of radio propagation. Ray Cracknell, G2AHU, has recently reminded me that in the late 1950s, while teaching in Southern Rhodesia (now Zimbabwe) and operating as ZE2JV, about 18° South, he had an article 'Transequatorial Propagation of VHF signals', published in *QST*, December 1959). He writes: "It seems a simple enough article, but a Japanese scientist published a paper suggesting that 28MHz signals to Australia did so in a single hop... At the same time the Russian Sputniks started sending 20 and 40MHz signals around the world. Meanwhile the Americans were preparing for greater advances.

"When my article was published, a senior member of the American project arrived on my doorstep. He sat and talked, inspected my gear in a friendly manner. The next day, I worked Chalky Whiting, ZC4IP (about 35° North) cross-band 50/28MHz as he was not permitted to transmit on 50MHz. We decided to investigate the propagation mode by measuring the time delays, with ZC4IP receiving my 50MHz pulses and then transmitting them back to me on 28MHz, where I displayed the outgoing and incoming signals on a CRT. The results were sent to ARRL

and they forwarded them to the US National Academy of Sciences who later wrote: 'Your unselfish co-operation with the Propagation Research Project has contributed significantly to the world's scientific knowledge in the field of VHF ionospheric radio propagation'."

The following years saw rapid progress in the exploitation of TEP. In a single day, ZE2JV worked all parts of the USA, Canada and one station in Central America. *QST*, November & December 1981, published his two-part article, compiled together with Fred Anderson, ZS6PW, and Costas Finneralis, SV1DH, 'The Europe-Asia to Africa VHF Transequatorial Circuit During Solar Cycle 21'. An earlier article (*QST*, December 1959) described the work of F9BG, ZC4IP, ZC4WR, and the St Helena 28MHz beacon, ZD7WR.

Partly as the result of a classic paper by Southworth ('Night-Time Equatorial Propagation at 50MHz' (*J Geophys Res* Vol 65 (1960), pp601 – 6 7), TE began to be investigated by several professional researchers, largely based on observations made by radio amateurs. A Japanese/Australian study formed part of the IQSY research programme and showed that TE propagation, even in years of low sunspot activity, could extend to above 70MHz. Observations were made between 1965 – 68 in southern Japan on three 500W beacon transmitters (32.8, 48.5 and 72.65MHz) located near Darwin in northern Australia, a path length of 4850km (3000 miles). On 32MHz, TE-mode propagation regularly occurred during a large part of the time (except for a few hours in the mornings) despite low sunspot numbers. On 48 and 72MHz, reception was much less frequent, but signals were heard at good strength on many occasions, mostly evenings/nights (about 2000 – 0200 local time on 48MHz, about 2000 – 2400 local time on 72MHz).

The Japanese believed that the night propagation differed from that noted in the afternoons, showing significantly less fading margins, and followed what became known as 'Equatorial Spread F', often correlating with local Sporadic-E. Equatorial Spread F was well known to amateurs and HF listeners in the tropics as a cause of violent disturbances and distortion on long-distance HF signals:

'TT', February 1972, reported that Dr L F McNamara of the Commonwealth Centre, based on work carried out by the Australian Ionospheric Prediction Service in New Guinea and southern Papua, had thrown further useful light on the occurrence of evening-type TEP on the circuits between Japan/Okinawa to Townsville, Queensland. These observations strongly supported the view, already put forward several times in 'TT', that long-distance TEP paths do not always depend on intermediate ground reflection and are often a special form of chordal hop or supermode: **Fig 1**.

Dr McNamara in 1971 also reviewed the various forms of TEP as, by then, identified. The first, the afternoon type, characterised by steady signals and occurring most frequently between 1700 and 1900 local mean time (LMT) at the equator. The evening type seemed most frequent between 2000 and 2200 with deep flutter fading of the order of 5 to 15Hz, both types most frequent around the equinoxes. The optimum path is symmetrical about and normal to the magnetic equator and about 6000km in length; longer circuits tend to see only the steady afternoon mode, while places with magnetic latitudes around 30° or less, usually see only the evening fluttering mode.

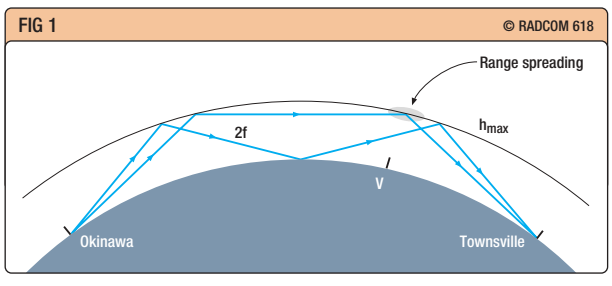
That there are still TEP puzzles remaining to be solved is clear from the first of a two-part article 'Non-Traditional Mechanisms of Transequatorial Propagation: Part 1', by Dave Craig, N3DB, in W3ZZ's 'The World Above 50MHz' column in *QST*, October 2005, pp86 – 88.

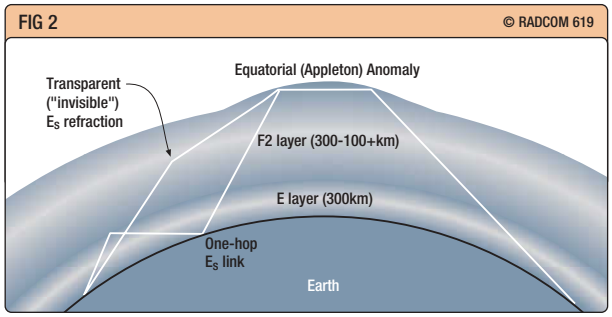
Conventional TEP theory suggests that TEP at high latitudes must include the presence of an intervening propagation mode, or modes. Only stations within about 30° of the geomagnetic equator have no difficulty in tapping into TEP propagation. To quote: "Barring an intervening propagation mode such as Sporadic-E, stations outside this zone cannot participate in these openings because their transmissions arrive at too steep an angle to allow refraction and waves continue through the ionosphere out into space: **Fig 2**."

N3DB is located about 48° North yet, on a significant number of evenings in Autumn 2000 he found, almost by accident while listening for 50MHz TEP, that he could occasionally hear stations in PY, LU and ZP working or calling Central American stations, most often between 0145 – 0245Z (local evening). Signals were fully audible but never strong. Beginning in August 2001 and up to the present, he has made 201 contacts (or beacon reception) on 50MHz that crossed the equator, sometimes when there was no evidence of Sporadic-E or scatter, particularly during the peak years of the solar cycle. Analysis of his contacts has revealed at least six in which TEP openings are apparently unlinked to Sporadic-E events. The most plausible explanation appears to be a chordal hop across the equator – a direct TEP link despite his northerly location. In Part 2 we are promised other reasonable explanations for these unusual TEP contacts.

Fig 1
Showing the difference between the conventional F2 double-hop path between Okinawa (about 23° north) and Townsville, Queensland (about 18° south) and the suggested supermode (chordal hop) path coinciding with range-spreading conditions above the ionospheric sound station at Vanimo (V) at 2100 hours local mean time. (Original source Dr McNamara's 1971 letter to *Nature*)

Fig 2
Showing how Sporadic-E refraction ('invisible E_S') is thought to form a mechanism to support TEP from stations at higher latitudes. (Source *QST*, October 2005)





NEW STEPS IN VARIABLE-WIDTH CRYSTAL FILTERS

The emergence during recent years of high-performance programmable DSP filters to provide variable bandwidth selectivity has tended to push the classic MF crystal filter further down the scale of concern of many amateurs. The process had already begun with the emergence of the low-cost HF ladder filters based on low-cost crystal or ceramic resonators. There is also competition at MF from mechanical filters and at LF from the 'sliding doors' analogue twin low-pass triple-mix filters as developed by Rohde & Swartz and exploited recently by Dick Rollema, PA0SE (see 'TT' June 2002 and October 2004). Yet there are still possibilities in further development of symmetrical variable-bandwidth MF filters as used in the German wartime E.52 receiver (see the notes

by DJ6EV in 'TT', January 2000 pp50 – 57). There has also been the investigation of the often-overlooked Bridged-T crystal-filter by Jack Hardcastle, G3JIR (see 'TT' May 1998, pp58 – 60). All the above references can also be found in volumes of *Technical Topics Scrapbook*.

A substantial packet has come through my letterbox from Horst Steder, DJ6EV, containing, *inter alia* 'The Classic Single-Ended Two-Pole Xtal Filter – a New (?) Method of Bandwidth Control'. To quote his accompanying letter: "If you are surprised to receive this heap of paper, please blame Jack Hardcastle, G3JIR. I have been in contact with him for years on the topic of classic crystal filters, which led to the exchange of very many e-mails and numerous conversations on the 40m band. So I decided to consolidate all the findings and discussions into one paper [2003, updated June 2005] as a reference for both of us.

"Recently, I started to conduct some experiments with the 2-pole filter to verify the equations and simulations in the consolidated paper, and to try out some new ideas of bandwidth control. We both think that some of the experimental results may be of interest to others, although the whole topic is certainly only of nostalgic value [surely not! – *G3VA*]

"However, the method of controlling the bandwidth very elegantly by variation of the quality factor (*Q*) of the terminating LC circuit through positive feedback *(Q*-multiplier effect) has never, to the best of my knowledge, been mentioned in any publication. The possibility of continuous bandwidth control by a DC voltage allows a multiple-stage crystal filter to be implemented using just two FETs per stage. This method could possibly be extended to the MHz range, but there are two limiting factors which would then have to be addressed:

- With AT-cut crystals and their low inductances, the terminating L becomes very small – in the order of 20 to 50nH. This could be addressed with an appropriate capacitive divider in the LC circuit.
- Because the relative bandwidth becomes very small, and the filter is very sensitive to detuning of the LC circuit, the frequency stability of the LC circuit should approach that of an oscillator stage.

"The necessary *Q* of 1500 to 2500 to give a flat top, or with some pass-band ripple for a typical SSB bandwidth, can easily be achieved with a good design of the feedback parameters.

"I have included part 2 of the original 1937 nine-page article on crystal filters with continuously variable bandwidth control [German text) by W Kautter of Telefunken. because most of the references and equations in my basic 24-page (English text) compilation are based on this paper.

"If there is anybody interested in this whole topic, all the papers are available in the Adobe PDF format and can be requested via e-mail [**h-g.steder@freenet.de**]. Of course all the programs (*DOS* and the new ones for *Windows*) are also available."

There is space here only for some brief notes on DJ6EV's recent experimental work as reported in his eight-page 'Experimental Results with the two-pole Crystal Filter 464.2 kHz'.

Fig 3 shows the basic filter used to verify the responses for two methods of bandwidth control, using either a 1MΩ log potentiometer as a variable resistor in parallel with the terminating tuned circuit or a 10kΩ log trimpot in series with the inductor. For convenience, both pots were soldered into the basic test filter. The responses for variation of the 10kΩ trimpot are shown in **Fig 4**.

DJ6JV's next step was to investigate the result of increasing the *Q* of the terminating inductor by means of positive feedback. The objective was to achieve flat-top responses at the narrower bandwidths, and to answer the question of whether it is possible to vary the filter bandwidth solely by a variable feedback control.

He modified the basic filter as shown in **Fig 5**. To obtain a narrower 3dB maximum bandwidth (about 2.4kHz instead of about 4.7kHz) without changing the inductor, a capacitive divider (two 325pF capacitors) replaces the single 160pF capacitor. The crystal now looks into an LC circuit with an effective L of about 180µH. Using this capacitive divider technique, it is possible to select any bandwidth less than the maximum defined by the inductor. The required *Q* to maintain the same pass-band ripple of 0.3dB is about 210, much higher than the actual *Q* of the inductance. DL6JV achieves

FIG 3 © RADCOM 620

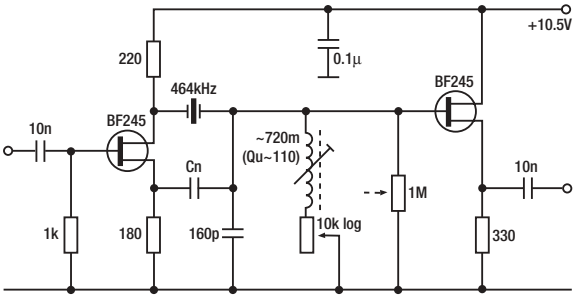


FIG 4 © RADCOM 621

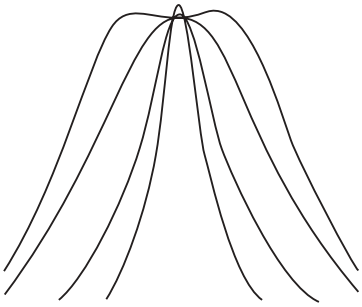


FIG 5 © RADCOM 622

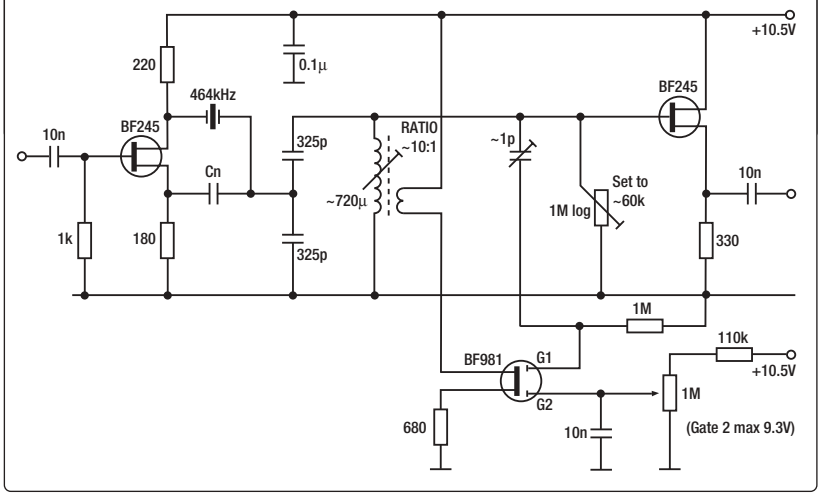


Fig 3
DJ6EV's basic test two-pole crystal filter (462.4kHz) with flat-top -3dB bandwidth of about 4.7kHz, but peaked responses at narrower bandwidths.

Fig 4
Measured filter responses for different values of the 10kΩ log pot. The responses match the simulated (calculated) responses very closely. Note the slight increase of amplitude at the narrowest setting, ie with highest series resistance.

Fig 5
Test oscillator modified to provide positive feedback (*Q*-multiplier effect). With feedback the maximum -3dB bandwidth is about 3.4kHz.

FIG 6 © RADCOM 623

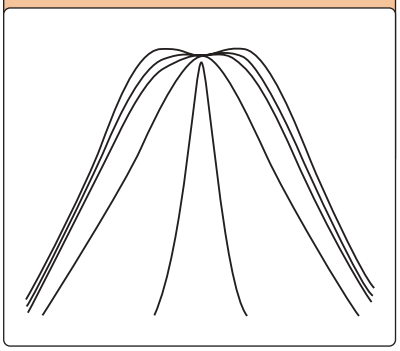
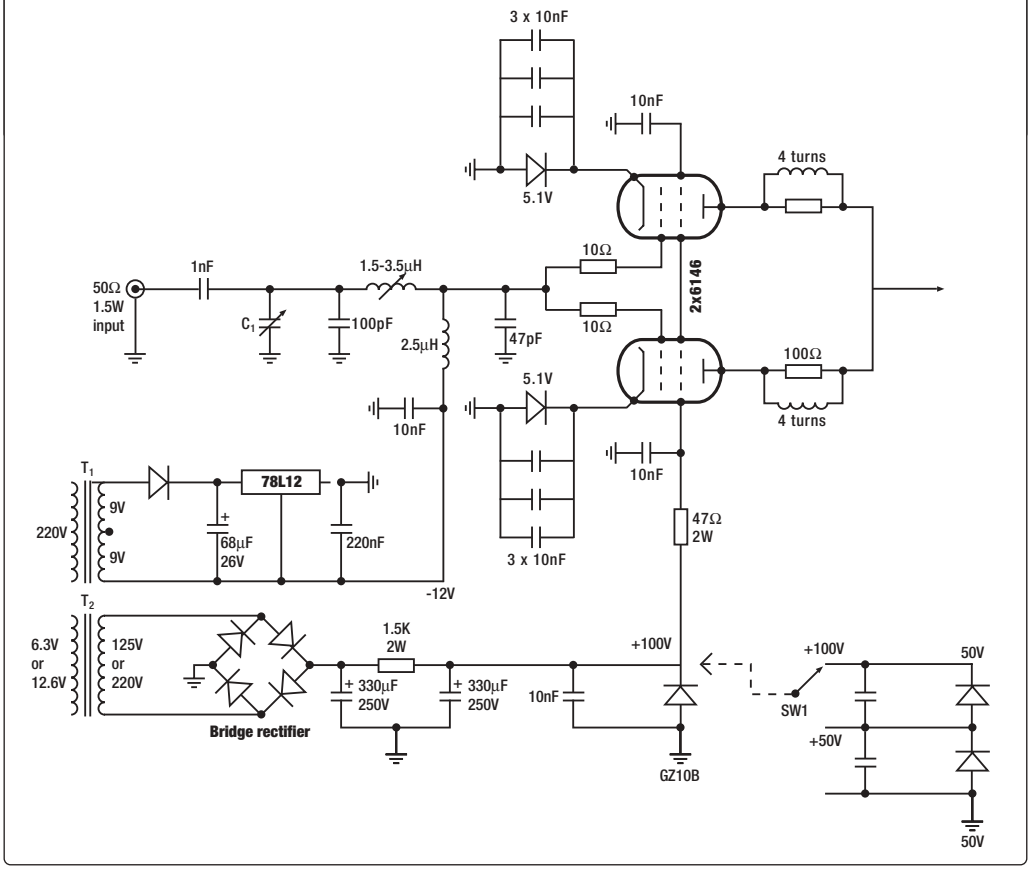


FIG 7 © RADCOM 624



this by introducing some positive feedback (*Q*-multiplier technique) by means of an additional BF981 dual-gate FET as shown in Fig 5, although he believes the feedback circuit is capable of further refinement.

The turns ratio of about 10:1 is an estimate. The feedback trimmer capaciitor (about 1pF) comprises a piece of insulated wire with a thin secondary winding enabling a very fine adjustment by adding or removing turns. The 680Ω resistor in the source of the BF981 was added to 'tame' the device, which has a high transconductance of about 15mS [S = Siemens = Ω^{-1} – *M5ACN*].

Bandwidth setting with the 10kΩ series pot is no longer possible, since the bandwidth becomes very narrow even with very low resistance. This needs further investigation.

DJ6JV stresses that no attempt should be made to adjust the filter without a swept-frequency setup: "The interdependence of feedback setting, LC tuning, and load resistance is extremely sensitive and can be handled only with such a setup."

His early results showed: (a) It is possible, with positive feedback, to achieve the required narrow bandwidth with a flat top or even pass-band ripple. A flat-top SSB bandwidth with an initial inductance *Q* of <80 with the proper feedback level; (b) with a fixed feedback setting, bandwidth control can be effected with a variable load resistor parallel to the LC circuit, but the method using a series resistor does not work satisfactorily; (c) *It is possible to control bandwidth by varying the feedback!*

To achieve this requires a very delicate balance of setting the load resistance such that, at maximum feedback, the maximum bandwidth with the desired pass-band ripple is achieved while, at minimum setting, the desired minimum bandwidth is reached with tolerable increase of insertion loss.

A variation in bandwidth of nearly 10:1 requires a feedback-gain change of at least 40dB. A small, but noticeable, distortion of the response curve top (loss) in the intermediate settings is seen.

Fig 6 shows the responses of his experimental 464kHz at various feedback settings.

Fig 6
DJ6EV's simulation of the CRT responses of the modified filter responses with bandwidth control by varying the positive feedback. Note the near flat-top responses at all bandwidth settings except the minimum.

Fig 7
How EA4EO has modified the bias circuit of his 100W linear amplifier to overcome the difficulty of replacing a 5W resistor. C1 is a 420pF variable capacitor from transistor broadcast receiver; T1 a miniature transformer providing 300mA or less; T2 is an inverted filament transformer. Optional SW1 power reduction switch for local contacts.

KEEPING THE PA WORKING

One of the continuing advantages of valve linear amplifiers, particularly the home-brew variety, is the relative ease of fault-finding and then getting them back into action. There is, however, one problem that can be time-consuming, if not impossible, to overcome – the present difficulty of locating a local source of high-voltage, high-wattage components. It is, however, often possible to overcome such problems with a little ingenuity and a firm grasp of valve-amplifier technology, as shown by Jorge Dorvier, EA4EO.

His 14MHz linear PA using two 6146 valves in parallel class-AB1 failed. He soon traced the fault to a failed grid-bias potentiometer (22kΩ 5W). Unfortunately, even in Madrid, a suitable replacement component was hard to come by. As in the UK and elsewhere, the majority of retailers who used to supply a range of components are now in the business of selling PCs and computer accessories.

EA4JO set about repairing his linear by devising a modified biasing arrangement using parts that are relatively easy to find, yet would give him the same biasing as the original classic -50V to the control grids to achieve a linear 100W PEP output.

His first thought was to have only two 5V Zener diodes in the cathode line, as shown in 'TT' August 2000, pp53 / 54. However, because his home-built amplifier used a special type of tuned-grid input (see his description in 'TT' September 2002, pp61 / 62) and his desire to maintain the same screen supply rather than the popular G2DAF system with four switching diodes, a double-bias system was adopted, adding a -12V to the grids using a cheap 78L12 IC regulator.

With this arrangement, the 6146s were operating in the AB1 linear region but, with the previous classic 195V on the screen, the 6146 anodes run dangerously red. The 195V supply used two GZ10B power Zener diodes in series. This gave the option of switching between 200V or 100V for full or reduced power for local contacts. A new, lower, screen voltage of 100V was provided using just one GZ10B power Zener diode. This permits the 6146 valves to run without problem. If the reduced-power option of the original is required, it would be better to use two 50V power Zener diodes in series, with similar switching. Both arrangements are shown in **Fig 7**. ♦

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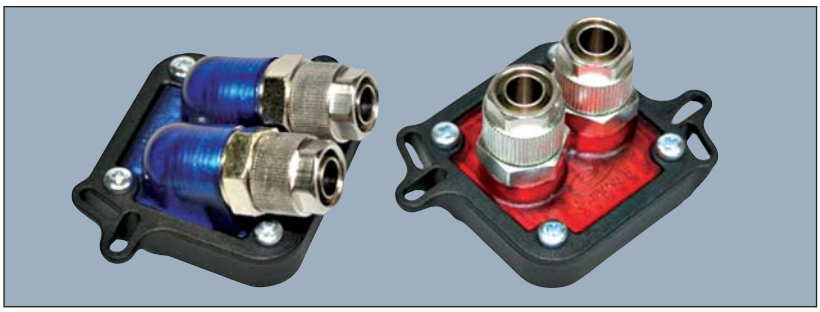
Whatever next

The last thing that consumers need is another battle of the video formats, but it looks as if they might get one. Water-cooling for amplifiers, and more from Scott E Robbins, W4PA, Ten-Tec's Amateur Radio Product Manager.



Above left: Two of the heat exchanger blocks offered by Innovatek.

Above right: The Ten-Tec Orion.

In this column some time ago, I brought early news of the Blu-ray disk, a proposed replacement for DVD that offers up to 50GB of storage capacity. However, even though Blu-ray has yet to become a commercial reality, a rival format has been developed and is being pushed. Consequently, we now look set for another battle reminiscent of the VHS versus Betamax videotape format war.

Blu-ray's rival is HD-DVD. It is a disc developed by Hitachi and Toshiba, and is supported by Intel, Microsoft, Sanyo and NEC. HD-DVD uses the same disc structure as existing DVDs, but employs a blue laser. It is the shorter wavelength of blue light that enables smaller areas of the disk to be recorded to and read from, and the beauty of it is that it is backwards-compatible with existing DVDs. However, although both new standards use a 120mm diameter disc (just like CD and DVD) and a blue laser, they are completely incompatible with one another. **Table 1** shows the capacities of Blu-ray and HD-DVD.

Key to the adoption of HD-DVD or Blu-ray is the home movie market and the sales of titles recorded in high definition. To this end, Blu-ray is supported by: 20th Century Fox, Buena Vista Home Entertainment, Electronic Arts, MGM Studios, Sony Pictures Entertainment and Vivendi Universal Games. But HD-DVD is supported by the similarly impressive list of: Buena Vista Home Entertainment, New Line Cinema, Paramount Pictures, Universal Studios and Warner Bros. Interestingly, the Walt Disney Company supports both!

The backers of Blu-ray argue it is a more sophisticated technology with a greater storage capacity, but HD-DVD supporters say their preferred technology will be cheaper, more durable and available sooner. Discussions between the two camps have been held to try to reach a compromise standard (ie Blu-ray's disc structure on HD-DVD, or *vice versa*), but apparently nobody was prepared to blink first so the talks dissolved without a resolution of any kind. Commentators are saying that if both formats reach the market the public will hold back on buying either until one is seen as a clear winner, thus squandering the huge commercial opportunity of selling movies in high definition, plus the associated TVs, etc.

KEEPING IT COOL

Those who push their personal computers to the limit will know only too well that heat generation is a big issue. Sure, you can employ bigger and more powerful fans to dissipate it, but they tend to be noisy. There is a parallel situation in amateur radio. 20 years ago, 100W transceivers were the size of briefcases and convection cooling was sufficient, but now there are several models about the size of a book and convection cooling is most certainly not sufficient.

The removal of excess heat is seen by many as crucial to prolonging the life of solid-state equipment, so it should come as no surprise that a water-cooling solution has been devised for the computing market. With radio amateurs being well-known for their ability to improvise and adapt, it should also come as no surprise to learn that some are now taking products from companies such as Innovatek and using them to cool solid-state amplifiers. With a range of pumps, blocks (see the photograph) and radiators available, it makes perfect sense to use such a system if fan noise is a no-no in your shack and you need to cool down a hot-spot.

THE NEXT GENERATION TRANSCEIVER

Last month, I brought you the first part of the detailed response of Scott E Robbins, W4PA, Amateur Radio Product Manager of Ten-Tec Incorporated to the 'Next Generation' transceiver project. His response continues: "Crystal filters are used as roofing filters to eliminate unwanted nearby loud signals from compromising overall receive performance. Ours was the first company to offer selectable crystal roofing filters (currently only available on Japanese transceivers at US $10,000 or more – Orion is $^1/_3$ the retail price) – and ours is the only company to offer mode-appropriate roofing filters down to a minimum of 250Hz. There are seven roofing filters used in the Orion (four are standard, three available as options).

"The Orion (see photograph) is equipped with a second general coverage receiver but, as is their nature, the receiver performance isn't as good as the ham-band-only receiver in the transceiver. It doesn't particularly need to be – as generally a second receiver is used for monitoring an open frequency or for listening to the 'domestic' side of a DX pileup rather than weak signal DXing."

I don't recall anyone at the Stevenage seminar mentioning they knew that Ten-Tec had already implemented a two-receiver transceiver that resembled the chosen design so closely that it is uncanny. I guess it is because Ten-Tec hasn't made huge inroads into the UK amateur radio market. Maybe, after this, it will increase its market share. Anyway, more from Scott next month. ♦

Table 1: Capacity of the Blu-ray disc versus HD-DVD.

Blu-Ray		HD DVD	
ROM single layer:	23.3 / 25GB	Single layer:	15GB
ROM dual layer:	46.6 / 50GB	Dual layer:	30GB
RW single layer:	23.3 / 25 / 27GB	-------	-------
RW dual layer:	46.6 / 50 / 54GB	-------	-------
Highest test:	100GB	Highest test:	45GB
Theoretical limit:	200GB	Theoretical limit:	60GB

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RG58C/U 50R MIL-C-17 cable stranded centre ....30p/m or £24.95 100m Drum
RG213 U 50R Mil-C-17 Coaxial cable 10.3mm.....80p/m or £70.00 100m Drum
RG59B/U 75R Mil-C-17 Coaxial cable .....30p/m or £24.95 100m Drum
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A time-out unit for digital modes

The author has run digital modes for a couple of years and, after a number of close calls, has designed a simple time-out circuit around the 555 timer IC. The original setup used a transistor/relay arrangement to provide isolation between the computer and the transceiver PTT line and, for convenience, the timer circuit has been added.

The article 'Simple Sound-Card-to-Radio Interface Circuits' by Peter Homer, published in the April 2004 *RadCom*, covered isolation of computers and transceivers to provide mutual protection in the event of a hardware failure in one or other piece of equipment. There is however always the possibility of the program or computer crashing with the PTT line remaining in the transmit state. This may not be too problematic in SSB mode if there is no modulation or if the operator is at the keyboard. But in Packet/*APRS*/*UI-View* modes, with FM modulation, and where the operators are, more often than not, absent for prolonged periods, the effect on the transmitter output stage can be catastrophic.

CIRCUIT DESCRIPTION

When the serial port goes positive (**Fig 1**), the transistor TR1 conducts, pulling the collector down to near 0V. When the serial port goes positive (Fig1) the transistor TR1 conducts, pulling the collector down to near 0V, energising RLA. During the very short period before the RLA contacts actually make, the trigger terminal of the IC, pin2, is also pulled down via the relay contacts RLA1, triggering the 555 timer period. The output of the IC, pin 3, now goes to almost 12V, energising the relay, RLB, and closing the PTT circuit via the contacts, RLB1. The timer resistor Rt will now start charging the timing capacitor, Ct, and when the voltage at pin 6 of the IC reaches an internal IC reference voltage, the output on pin 3 will fall to 0V releasing relay RLB and breaking the PTT circuit. When the serial port returns to 0V, relay RLA will be released bringing the reset terminal of the IC, pin 4, to 0V by way of contacts RLA2, which resets the timer. Similarly, if the serial port returns to 0V before the timing period has expired, RLA will be released, the timer will be reset, releasing RLB and breaking the PTT circuit.

Summarising, when the serial port goes positive, the transmitter is keyed until such time as the serial port returns to 0V or the timing period, set by Rt and Ct, has expired.

The timer period is controlled by Rt and Ct, according to the expression Tp = 1·1 x Rt x Ct seonds. With the values shown in the circuit, the period should be about 110 seconds. In fact, the breadboard and two working models were both in the region of 120 seconds, no doubt due to tolerances of the capacitors. The timing period can be modified by the adjustment of Rt and Ct, but increasing Rt beyond 1MΩ is not recommended.

Beware of leaky capacitors that will have a significant effect on the timer period with such values of resistor.

The LEDs are optional. LED1 indicates that the computer is signalling a 'transmit' condition and LED2 indicates that the PTT is activated.

The switch, S1, when closed turns the timer function off by holding the trigger terminal in a continuously-triggered state when the serial port is positive, ie signalling a 'transmit' state.

FIG 1 © RADCOM 625

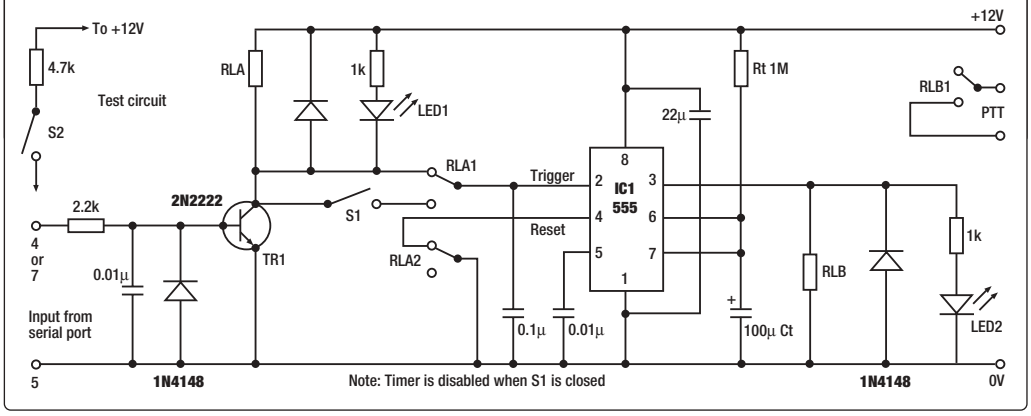

Fig 1
Circuit diagram of the time-out unit.

COMPONENTS LIST

Resistors – all 0.25W

1 off	2.2kΩ
2 off	1kΩ
1 off	1MΩ
1 off	4.7kΩ. For testing only

Capacitors – all 16V minimum

2 off	0.01µF
1 off	0.1µF
1 off	22µF
1 off	100µF

Semiconductors

1 off	2N2222 npn transistor
3 off	1N4148 diode
1 off	NE555N integrated circuit
2 off	Standard LED, any colour

Relays

2 off	miniature DPDT relay, 700ohm coil, 12V, Maplin UQ89W

Miscellaneous

2 off	SPST switch. One is required only for testing

TESTING

The timeout period can be checked by connecting the input to the 12V supply via a 4.7kΩ resistor, such that it presents about 5V to the input terminal. When S2 is closed, both LEDs should glow and when the timing period expires, and LED2 should extinguish. Opening S2 will reset the timer and the process can then be repeated. If S2 is opened before the timing period has expired, both LEDs should extinguish.

DUAL-PORT OPERATION

Depending on the software, it is possible to run two separate programs on one soundcard by using both the left and right channels. The left channel being presented on the tip of the line in and line out stereo jacks and the right channel on the rings. You will probably find that microphone sockets are mono and, where dual-channel operation is required, it will be necessary to use a 'line' or 'auxiliary' input.

Pin 7 of the serial port is the left channel and pin 4 is the right. Pin 5 is common for both channels.

EARTHING

It is desirable to isolate the computer completely from the radio equipment. If this is cannot be done, it may be preferable to bond down all equipment to the station earth. ♦

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Fig 1
Currents in the Method of Images model for a low dipole above perfect ground.

Fig 2
Unfolded IIDM – basic grounded antiphase-fed model. X-elevation θ is about 45°. F1, F2 are antiphase feed-points.

Fig 3
Method of Images model for an unfolded IIDM antenna reflected in perfect ground.

FIG 1 © RADCOM 626

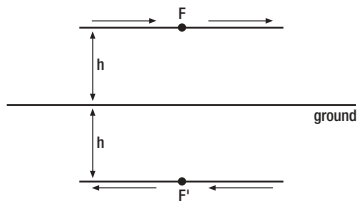


FIG 2 © RADCOM 627

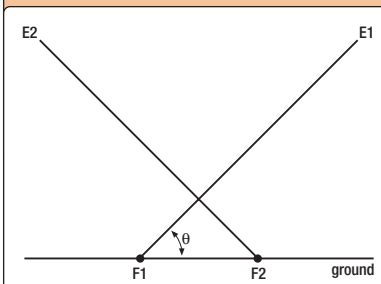
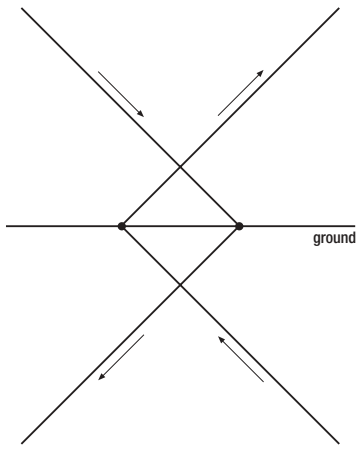


FIG 3 © RADCOM 628



Near-Vertical-Incidence Skywave (NVIS) propagation details for short-haul HF communications (up to 500km) appear in the literature [1, 4, 6, 10]. More details, including diurnal variations in F-layer ionisation and the effects of solar cycles and flares can be found in [2, 4b, 8a]. Sporadic-E (Es), well-known for DX propagation at VHF, can also make significant contributions at HF to NVIS [12].

Advantages of NVIS [3a, 4b, 10, 11] also extend to mobile and portable operating [3a, 4a, 6] in that contacts may be achieved in difficult terrain when failing vertical antennas are replaced by slanted whips or low horizontal wires.

For fixed stations, the low half-wave dipole and its derivatives, including doublet, inverted-V and G5RV, are all good NVIS performers. Here, a more recent antenna is examined, which was developed for cramped locations, the Inwardly-Inclined Dual-Monopole (IIDM). After using a G5RV followed by five years of building IIDMs and on-air testing, I am satisfied that a well-matched IIDM offers comparable NVIS performance to a low dipole.

NVIS ANTENNA FAR-FIELD PATTERNS

Reliable communications between NVIS stations requires antennas with a broad but vertically-directed far-field (FF) pattern. Ideally the main FF lobe shape should be near spherical [1, 6]. FF patterns described here will represent the total field, because for NVIS, polarisation is of little practical consequence, as it is effectively scrambled by non-uniformities and Faraday rotation [8b] within the ionospheric medium.

Plots of simulated FF patterns are usually based on the Method of Moments (eg Kraus [2a]). Here, we apply the Numerical Electromagnetic Code (*NEC-2*) as implemented by *EZNEC*™ software due to Roy Lewallen, W7EL [5]. Although not the only simulator program available, it is an impressive time-saver and exploration engine for antenna design.

The FF plot of a half-wave low dipole at about 0.15λ (6.3m at 7.1MHz) is a slightly distorted sphere (Fig 5b of [6]) – for practical purposes, excellent. Hence this antenna's popularity for NVIS work.

The FF plot for the low dipole over real ground has a similar shape with less gain. *EZNEC*™ simulation variables can include resistive wire losses and dielectric ground properties (cf [2b]). In practice, the latter will vary considerably between locations and conditions such as water table depth.

What determines FF pattern shape? **Fig 1** shows a low dipole and its reflected image in a perfect ground. Applying the Method of Images [see Kraus, 2c], the sinusoidal current distribution and instantaneous current direction (arrows) in the dipole above the ground are in antiphase with respect to the image. Thus for any point above the ground, the resultant field computed from the dipole and its image is as if we had used two separate dipoles at a distance 2h apart, fed 180° out of phase. In practice, the overall effect of lossy earth is a 'blurring out' of the subtle details that may occur in FF patterns modelled over perfect ground, in particular at angles close to the ground. Hence comparisons of FF patterns for different antenna configurations are best made initially with perfect-ground models.

INWARDLY-INCLINED DUAL-MONOPOLE (IIDM)

The inwardly-inclined dual-monopole (IIDM) antenna in its basic form (**Fig 2**) is a pair of vertical crossed quarter-wave monopoles [1, 6, 9] in which the two elements lean towards each other, crossing over but not touching. They are fed in antiphase.

The near-spherical IIDM FF pattern (Fig 5a of [6]), predicted by *EZNEC*™ over perfect earth, bears close resemblance to that of the low dipole and the vertical gains are

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NVIS working

almost identical. The corresponding 'real' ground FF profiles are also of similar shape. Invoking the Method of Images [MoI] again, **Fig 3** shows how the monopole elements and their corresponding images in the ground behave like a pair of bent half wave dipoles. From a far distance in the XY plane, the vertical components of fields arising from the antiphase currents in both dipoles effectively cancel, producing a near-zero horizontal field. But, towards the zenith, influences of the horizontal components of the antenna and image currents predominate, and the resultant FF pattern closely resembles that of a low dipole and its ground reflection.

MATCHING REQUIREMENTS

To create the required FF pattern, the IIDM antenna of Fig 2 has a near-optimal cross-over geometry between a quarter and a third of an element length, verified using *EZNEC*™. But what about feed impedance?

For a low half-wave dipole, a decrease in radiation resistance, Ri, from its free-space value of 73Ω down to about 30Ω is quite tolerable. But for the IIDM, the above MoI arguments suggest a significant mutual resistance contribution [2d]. The resulting Ri falls to less than 3Ω. Fortunately, this can be remedied by slightly increasing the element lengths and tuning out the extra inductance of each element plus its feeder wire with pre-match capacitors (Cm in **Fig 4**). The added lengths and Cm values are adjusted together so that the antenna presents a feed impedance close to 50Ω. The antenna is fed via a dedicated balanced matching unit (M in **Fig 5**).

MATCHING UNIT AND BALUN

The matching unit details in Fig 4 include air-spaced variable capacitors and an air-cored balun [3b]. If desired, a choke or W2DU-type balun [3c] may be used. Alternatively, 'distributed' capacitors may be constructed from coaxial cable, as part of the connections to the lower ends of the IIDM elements. But, for initial experimentation, air-spaced variable capacitors are favoured.

During *EZNEC*™ simulation, the single RF 'source' within M is at the mid-point of a short central wire (BC in Fig 4). In the *EZNEC*™ models, the capacitors were lumped (at the 30% and 70% positions) on this wire, with the antenna resonated by adjusting the Cm values, which should ideally be equal to within 10%. But slight differences do not significantly affect the FF lobe shape, which is determined primarily by element geometry.

VERTICALLY ALIGNED IIDM ANTENNA

For the IIDM antenna of Fig 5, height above ground is not critical and, as with a dipole [4c], may be varied (at M) up to about 0.25λ while maintaining a good NVIS FF profile. SWR for this IIDM antenna model [6] was 1:1 at 7.1MHz, rising to 5.7 at band edges (no losses, perfect ground). This compares with a band-edge SWR of 1.65:1 for the low dipole, although the effects of copper losses and real ground would flatten both SWR curves significantly. Practical realisation of

FIG 4 © RADCOM 629

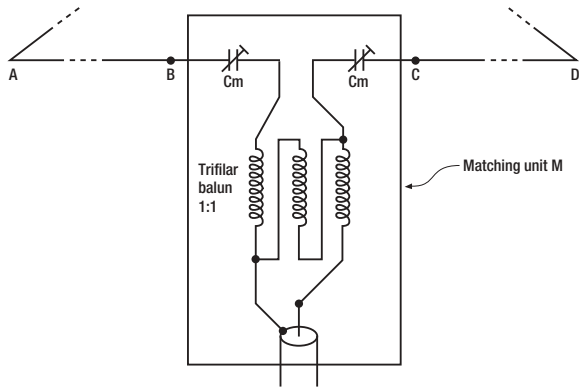


FIG 5 © RADCOM 630

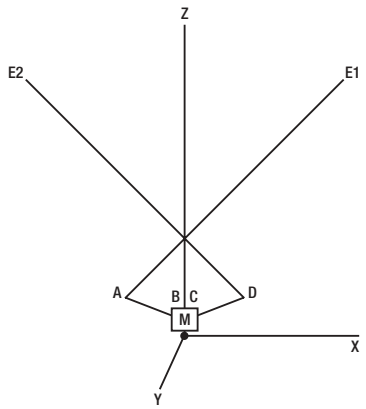


FIG 6 © RADCOM 631

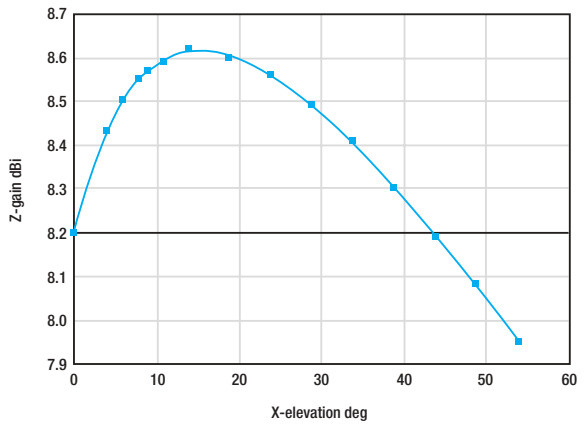


Fig 4
IIDM matching unit (M) schematic – including trifilar air-cored balun.

Fig 5
Initial perfect-ground model of a vertically-aligned IIDM with balanced feed and matching unit (M). Dimensions for 40m (λ=42.22m) are: heights, E1 and E2 overall = 9.74m; M above ground = 0.5m; X-separations, tops of E1, E2 = 13.0m, of A and D = 6.26m; Y-separations, of A and D and at cross-over point = 1.0m; wire lengths E1 and E2 = 12.67m; AB = CD = 3.23m; BC (in matching unit) = 0.2m.

Fig 6
Zenith gain of IIDM of Fig 5 versus X-elevation of the elements, pivoted about their junctions with the feed wires (0°= horizontal). In order to maintain a small footprint compared to a dipole, angles of 20 to 50° are favoured.

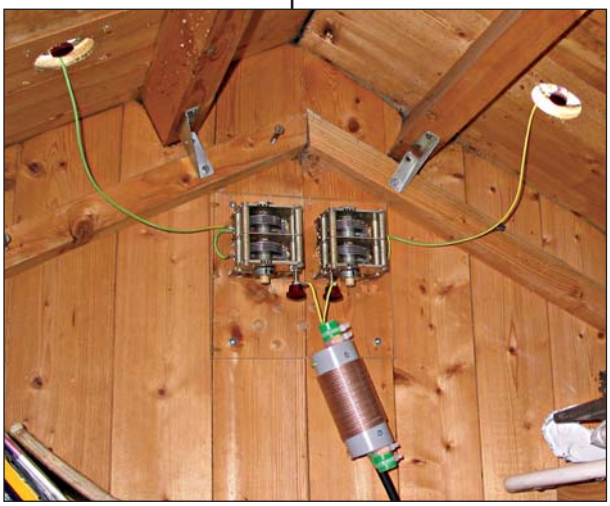


FIG 7 © RADCOM 632

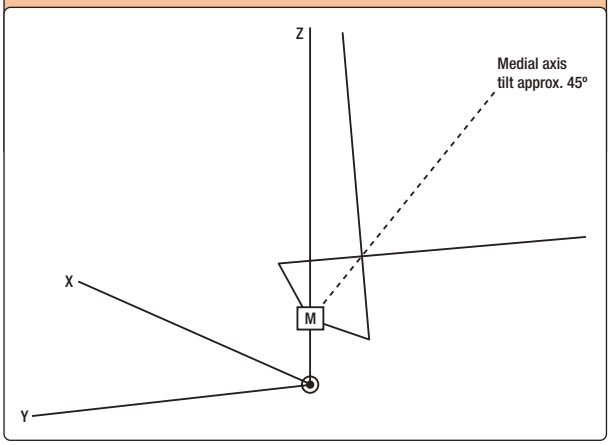


FIG 8 © RADCOM 633

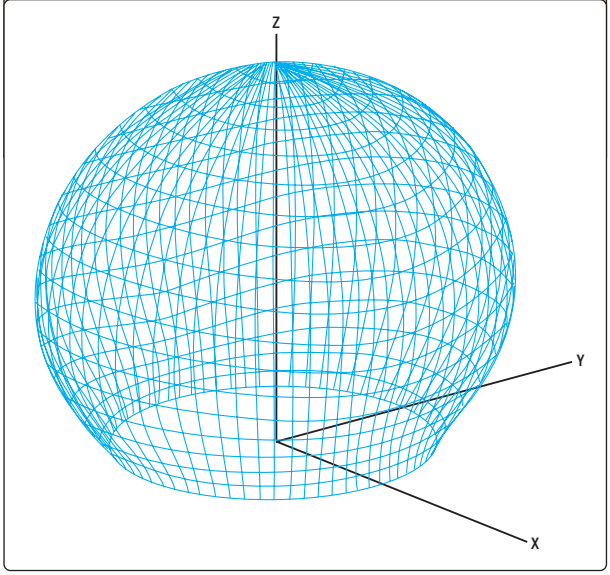


Fig 7
Slant IIDM antenna. The medial axis is tilted in the YZ direction. The vertically-directed FF pattern is maintained with negligible distortion for practical purposes.

Fig 8
FF pattern (perfect ground) for slant IIDM, retaining NVIS compatibility. Zenith gain is 8.2dBi and ground-level sidelobe gain is about -6.5dB (see text).

1:1 SWR at 50Ω over real earth requires shortening of the wires (see later).

ZENITH GAIN AND X-ELEVATION

X-elevation close to 45° is favoured as a working compromise between physical compactness, zenith (Z) gain and sidelobe contribution. For practical purposes, the latter is negligible and has only a marginal effect on zenith gain. In **Fig 6**, zenith gain varies with X-elevation between 7.9dBi and 8.6dBi. In this range, the lobe shape is barely affected, demonstrating considerable variation in geometry without compromising antenna performance. At the recommended inter-element separation of around 0.025λ for the IIDM, there is only slight difference in 'real' ground FF pattern shape and zenith gains compared with the dipole [4c], both estimated to be around 6dBi, the differences in FF pattern being even less.

CASE STUDY: A PRACTICAL SLANTED IIDM

At the home location, a convenient configuration for 40m turned out to be an elevated IIDM (**Fig 7**) with Y-direction tilt near 45°. The predicted perfect-ground FF pattern (**Fig 8**) was compatible with NVIS (cf [6]). Under real-ground conditions, the minor ground lobe contributions effectively disappeared.

One element was supported from a chimney via polypropylene cord, and the other element likewise suspended from a metal tilt-over mast. The metal mast was split electrically with a short length of plastic pipe between a tubular clamp and the top section. The sleeve joint capacitance (around 100pF) was included in the *EZNEC*™ model, which usefully indicated the reduced interaction.

PRACTICAL MATCHING UNIT

The perspex capacitor board was screwed to the inside of a shed wall near the roof apex. The variable capacitors were linked via terminals through small perspex covered portholes cut in the shed roof, as shown in the photograph. Alternatively, the matching unit may be assembled in a weatherproof enclosure [6] on a pole or other convenient support.

Both capacitors were surplus two-gang air-spaced types of identical design with the gang-section stators wired in parallel to give maximum total capacitance per unit of 180pF.

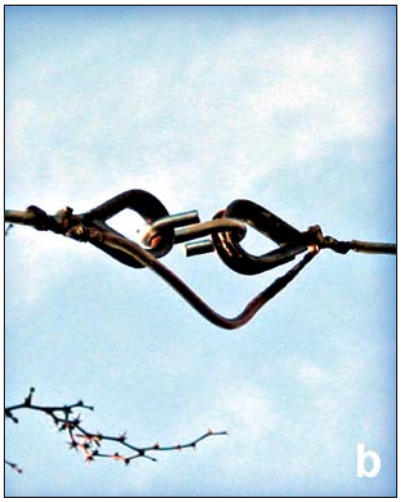
Each capacitor was roughly calibrated with the MFJ-946B analyser, using an indelible pen to mark off capacitance steps. The trifilar balun was wound with 10 turns (x3) of stranded 18SWG PVC insulated loudspeaker wire on a 2in diameter, 6in length of plastic drainpipe.

DEVELOPMENT STAGES

Initially, two designs in *EZNEC*™ were produced for the slant antenna, both corresponding to an SWR (50Ω) of 1:1 at 7.1MHz. The first was a simulation with perfect ground. The second introduced copper and real ground losses, with *EZNEC*™ ground simulation parameters estimated for the surrounding sandy terrain (conductance 0.001S/m, relative permittivity = 2). The antenna was shortened (by about 7%) with readjustment of Cm to achieve 1:1 SWR. This procedure was a guide for the final design (below) in which wire length adjustments would be physical.

INITIAL TRIALS

The first design assumed lossless non-insulated 2mm wire over perfect ground, for which resonance was predicted (VSWR = 1:1) at pre-match capacitor values, Cm, of 42pF. An implementation was constructed with the same total wire length. Above real earth, as expected, it gave a higher minimum SWR (of 3.7:1) at 7.1MHz. To achieve an SWR of 1:1 in practice, without shortening the wires, it was necessary to tune the Cm capacitors to about 90pF. As expected, this shifted the resonance point considerably, the frequency reading on the MFJ analyser directly coupled to the antenna being 6.3MHz. Even so, this trial antenna, with Cm readjusted back to 42pF, performed well on 40m in spite of the residual minimum SWR. Matching to the transmitter was done with the shack



From left to right: Practical matching unit, showing capacitors with air-cored 1:1 balun and connections to roof ports. Each perspex terminal plate is screwed over the circular aperture and weatherproofed with silicone sealant. Outside, the antenna wires are secured to the roof via plastic 'chain' type insulators and connected to the terminals with short bridging leads.

Slant IIDM – practical implementation. Shed at lower right contains the matching unit shown in Photo 1.

(a) Joins made with hooks and eyelets are bypassed with soldered connections; (b) close-up of the join.

Ground-level testing of shortened IIDM with loading coils for vehicular use (as in [6]). The wire antenna is supported on the glass fibre poles.

ATU. Estimated connection losses were around 0.5 to 1dB, using 30ft of RG-213 cable, total losses being increased slightly by the SWR.

FINAL SCHEME

The above design was scaled down in *EZNEC*™ using the frequency ratio 6.3/7.1, followed by addition of 2m of extra wire added to each (element + feeder wire) unit. This antenna was erected and the vanes of each pre-match capacitor set to their 120pF calibration markers. Then the antenna was shortened progressively by substituting pre-cut wire sections with hooks and eyes, the lengths being 'binary' multiples of half a metre: *viz* x1, x2, x4, used in suitable combinations equally on each side during the process. The wire sections were inserted or removed at the 'elbow' regions where the elements joined their respective feeder wires (see 'Further Construction Points' below). Tension was readjusted and the SWR at 50Ω checked with the antenna analyser at 7.1MHz, while both capacitors were backed off together. Eventually, an SWR of 1:1 was attained with Cm settings near to 100pF.

Using the antenna analyser on the 40m slant IIDM gave 40m band-edge SWRs of 2.4:1. On test, the band segment 7.000 to 7.130MHz could be covered with an SWR better than 1.7 to 1 using the 'bypass' switch position on the MFJ-941 shack ATU. The antenna has behaved well, with consistently good contacts under favourable NVIS conditions. The completed antenna appears in the photograph.

EZNEC™ simulations on frequency-scaled antennas revealed simple proportionality relations for wire dimensions and Cm values versus centre frequency (Fc). Using the above practical antenna parameters, a set of IIDM design equations for the Fc range 3.5 to 18.5MHz was obtained:

E1 = E2 = 0.255λ
AB = CD = 0.073λ
BC = 0.0047λ
Feed-point height = 0.062λ
Crossover separation = 0.03λ
Cm(pF) = 710/Fc

The lengths obtained are the expected 'target' values, after shortening in the manner already described. 2mm diameter wire is assumed with PVC insulation; for bare wire add 2% to the lengths. Cm should not be affected.

Medial axis Y-elevation should be between 30 and 50° with equivalent X-elevation (before tilt) of between 20 and 45°. Slight variations in symmetry involving lengths and angles can be tolerated, but try to ensure the same total wire lengths are 'seen' by each side of the matching unit, and use similar Cm values.

FURTHER CONSTRUCTION POINTS

For 40m and 60m IIDMs, tolerances of ±10 cm in total wire length (element + feeder wire) should not adversely affect the FF pattern and any consequential mismatch may be readily compensated by tweaking the Cm capacitors.

Antenna support involved home-brew perspex insulators along with elasticated luggage straps. Slots in the insulators had their edges rounded off with a rat-tail file. Joins made with hooks and eyelets should be bypassed with soldered connections, as shown in the photograph. When satisfied with the antenna dimensions, the straps may be replaced with polypropylene cord.

ALTERNATIVE IIDM DESIGNS.

Folded variants in the IIDM family [1, 6, 7], modified by having squared-off elements, are useful for reducing antenna height. Multiple folding increases antenna radiation resistance and widens the bandwidth. VHF and UHF embodiments with finite ground planes behaved as predicted [1]. Shortened balanced-feed IIDMs with loading coils are suitable for portable use, eg on the roof of a Land Rover [6]. *EZNEC*™ simulations suggest that nested IIDM configurations for multi-band capability are a promising approach. These and other IIDM developments are creating interesting new opportunities for experimentation. ♦

ACKNOWLEDGEMENTS

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In Practice

Myths of 'balance' ♦ Season's greetings

'BALANCED' FEED-LINE

Q ***What do we mean by a 'balanced antenna' or 'balanced feed-line'?***

A In amateur usage, those terms mean little or nothing! They cause so much confusion that we'd be better off without them. Many amateurs will be shocked to learn that balanced antennas and balanced transmission lines do not exist – not in the real world. Even in theory, they can only exist under highly idealised conditions. What we have in practice is largely a collection of myths.

Misunderstandings about 'balance' and 'baluns' are a major cause of poor antenna performance and EMC problems, so I make no apologies for returning to this topic yet again. The same question keeps coming up, time and time again.

For antennas and feed-lines, the word 'balance' implies complete electrical symmetry with respect to ground potential. The typical textbook example of balance shows a doublet antenna, centre-fed with parallel-wire line, in a completely symmetrical layout (**Fig 1**). If all of these conditions can be met – but *only* in that very special case – then there would be equal currents at the two terminals of the antenna, leading to equal and opposite currents flowing into the two wires of the feed-line. There is also electromagnetic coupling between the antenna and the feed-line, but since the layout is perfectly symmetrical, it does not affect the balance of the feed-line. If the feed-line currents are equal and opposite, the combined electromagnetic fields from the two wires would cancel out in the far distance, so the feed-line would be doing nothing other than transporting RF energy from the transmitter to the antenna... which is all a feed-line is supposed to do.

The first myth is that the idealised picture of Fig 1 ever happens in real life. Note that the field lines also couple to the ground, and to surrounding objects such as buildings, trees and metal support masts. To achieve symmetry, the ground would have to be perfectly flat and parallel to the antenna, and every object on the left of the antenna would need to be duplicated as a mirror image on the right. This simply doesn't happen in the real world, and least of all in your back garden! **Fig 2** shows a much more realistic situation where the feed-line is not symmetrical with respect to the antenna, and neither is the environment. In this case, it's a serious mistake to assume that *anything* will be balanced.

The second myth is that if you cut the two sides of the antenna to equal lengths, and use parallel-wire feed-line, everything else will somehow balance itself out. It won't! There seems to be a touching belief that antennas and twin-wire feed-lines somehow 'try' to be balanced; but in reality they don't try very hard. In more technical language, the electrical balance between the two halves of a symmetrical antenna is easily upset by an asymmetrical environment. It is even more severely upset if the feed-line fails to run exactly down the line of symmetry, which is a widespread failing of the typical back-garden layout for a doublet antenna (Fig 2).

Myth number three is a widespread belief that twin-wire feed-line means balanced feed-line, because it will only carry equal and opposite currents. This is totally false – the two wires are perfectly capable of carrying unequal currents, and they won't do anything to oppose that situation. As the example in **Fig 3** shows, the unequal currents 1.0A and 0.8A can be separated into two different *modes*: the *differential* mode with equal and opposite currents of 0.9A; plus the remainder of 0.2A which is called the *common-mode* current. As we have seen, the differential mode is the true transmission-line mode, which transports RF energy but does not radiate it. But the common-mode current flows *in one direction only*, and although it is represented in Fig 3 as 0.1A in each of the two wires, common-mode current behaves as if it was all flowing on a single-wire antenna. So if a feed-line is carrying common-mode current, it will radiate. I repeat: the differential and common modes will coexist completely freely on a parallel-wire feed-line, which means your transmission line can very easily become an unwanted radiating part of your antenna system. Many antenna users are totally unaware that radiation from their feed-line is causing poor transmitting and receiving performance; but worse than that, the unwanted common-mode current will flow back into the shack, often forming a potent source of EMC problems.

Because twin-wire feed-line is completely vulnerable to common-mode currents, **it's also a myth** that you

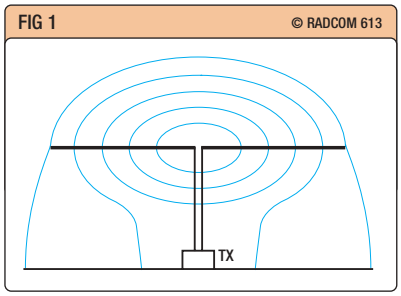

Fig 1
Idealised picture of electric fields around a symmetrical doublet fed with parallel-wire line.

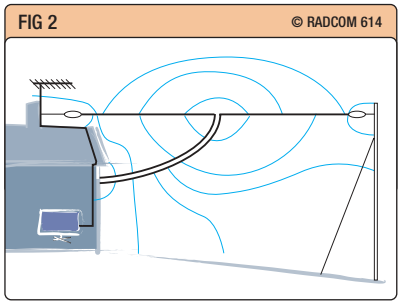

Fig 2
The typical reality – nothing is symmetrical, and radiating common-mode currents will flow on the feed-line.

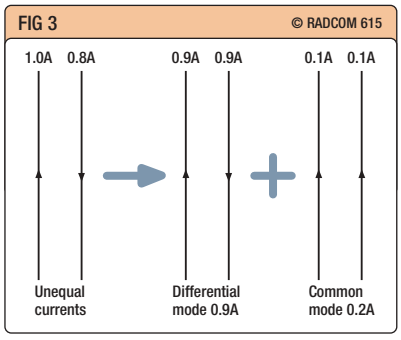

Fig 3
Parallel wires can readily carry unequal currents. These currents can be resolved into two coexisting modes: the differential (transmission-line) current, and a common-mode current.

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can buy 'balanced' feed-line off a reel. At the point of sale, that claim is highly premature! When you come to install the feed-line as part of your antenna system, you'll need to take positive action to promote the differential transmission-line mode, and to suppress the unwanted common-mode currents. A 'balanced' feed-line will not happen by chance: to make sure it lives up to its name, you'll have to put in some work.

FIG 4 © RADCOM 616

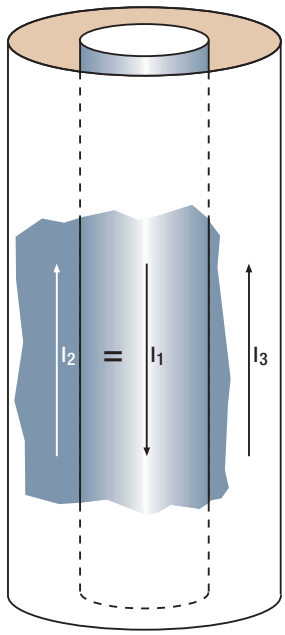

Fig 4
Currents I1 and I2 on the inside surfaces of coax are always equal and opposite; but a current I3 can flow independently on the outside of the shield.

FIG 5 © RADCOM 617

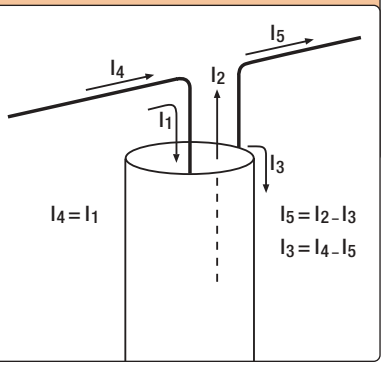

Fig 5
If the antenna currents I4 and I5 are unequal, this will *force* I3 onto the outside of the coax shield.

Turning now to coaxial feed-line, **myth number five** is that coax can be 'balanced', in any of the senses I've been describing above. Let's quickly review how a coaxial feed-line works. Coax is popular because it is a shielded transmission line which you can install almost anywhere. Its transmission-line currents and fields are almost totally confined inside the outer shield, thanks to the skin effect that forces RF currents to flow only on the surfaces of conductors [1]. But the shield has an outside as well as an inside, and the skin effect also means that a completely independent RF current can flow on the outside. In an asymmetrical antenna installation, this 'I3' current (**Fig 4**) behaves exactly like a common-mode current in parallel-wire feed-line (Fig 3). It is true that equal and opposite currents I1 and I2 exist *inside* the coax, because of the very strong electromagnetic coupling between the centre conductor and the inside of the shield. However, this does not equate to 'balance' in any of the ways described above for parallel-wire feed-line. The exact equality between I1 and I2 simply means that if unequal currents I4 and I5 are arriving at the feed-point from an unbalanced antenna, the difference between these two currents will be *forced* onto the outside of the coax, where it flows as a totally separate current, I3. The outside of the shield then radiates as a thick single-wire antenna. This situation is shown in **Fig 5**, and is very like Fig 3 for parallel-wire. The most important thing to understand is that, in both cases, the feed-line will do nothing at all to prevent these unwanted antenna-mode currents. For coax and parallel-wire alike, all the help must come from *you*.

A related myth is that if a coax-fed dipole could be made perfectly symmetrical (rather like Fig 1) then there would be no outer-surface currents. But look more closely at Fig 5. The coax has perfect left-right symmetry, but even if the antenna and its environment could be made symmetrical too, the connection at the feed-point is stubbornly asymmetrical. Therefore it's much more realistic to accept that there will always be *some* outer-surface current, I3, originating at a feed-point like Fig 5, and that it can't ever be exactly zero.

Underlying all of these myths is a belief that balance is the 'natural' situation, the way antennas and feed-lines would like to behave. But the opposite is true: perfect balance is very *un*-natural, a theoretical concept that is very hard to turn into reality. For practical antenna work, forget 'balance' and work directly on the real problem: the unwanted antenna-made currents on your feed-line.

For example, when you make a transition from a dipole antenna into coax (Fig 5), you want to minimise the 'I3' surface current on the coax. You can do this by using a feed-line choke to create a large series impedance on the outer surface, as close as possible to the feed-point. Practical techniques have been widely published, and options include winding the coax into a coil to make an RF choke, passing the cable through large number of ferrite beads, or winding it on a toroid or other type of ferrite core [2]. The interesting thing is that as you force I3 towards zero, you also force I4 and I5 to become more nearly equal, so you are making both the antenna and the coax behave as they should.

Because unwanted feed-line currents cause so many different kinds of problem, I have given several practical examples of reducing unwanted feed-line currents in previous columns [2]. There will certainly be many more questions on this topic; but the concept of 'balance' is so surrounded by myths and confusion that it doesn't provide any answers.

SEASON'S GREETINGS

Thanks for all the questions and contributions that make it so interesting to write this column. Happy holidays, and best wishes for 2006. ♦

NOTES AND REFERENCES

[1] See 'skin effect' in the Cumulative Index on the 'In Practice' website.
[2] Follow the links from 'In Practice' website.
[3] Again, see the Cumulative Index on the web.

Members' ads

FOR SALE

ADVANTEST R3361 spectrum analyser, software upgraded, 3.6GHz, printer option, tracking generator, good cond, £2950 ono. Graham, G6BSS, 07880 553 660, 01895 442 864 (W Drayton). E-mail: higgyuk@go.com

AMA-3 and AMA-5 CapCo magnetic loops together 3.5 – 28MHz, c/w power cables and control box. As new, unused. Pro-Am vertical portable aerials for 3.5, 7.0, 14.0, 21.0 and 28MHz, new in original packing. 5 aerials, £20. 70cm 8-ele Yagi, new, £5. Satellite dish (not Sky) 2ft diameter with LNB, £2. Peter, G4DPY, 01205 871 410 (Boston).

ANTIQUE wireless equipment 1910 to 1945, scientific, military, domestic. Also clearout of unused equipment. SAE or e-mail for list. E-mail: w-moorwood@supanet.com (Wolverhampton).

COLLECTORS' items. 400W linear 2 x 813, £50. Kay Sonograph, £30. Huge roller-coaster coil, £10. Phone for list. G3MFW, QTHR, 01726 73608 (St Austell).

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0TMR	Mr M R Ravenscroft	22/09/05
G0WQR	Mr J Young	17/10/05
G1ICP	Mr J B Young	2005
G2DSP	Mr R Allen	29/05/05
G2KU	Mr R M Herbert	
G3BFC	Mr W H C Wheeler	12/10/05
G3MJW	Mr D Edmunds	10/05
G3REA	Mr C F Peers	06/05
G3UEK	Mr R W Curtis	
G3WBF	Mr A C Hunter	
G3XUL	Mr P J Carter	11/10/05
G3YEE	Mr R Short	05/09/05
G3ZO	Mr S Wilkinson	09/05
G4AVO	Mr R J Thompson	28/09/05
G4XRL	Mr E J Otty	10/05
G8BKX	Mr O W Pearce	
G8DQJ	Mr A G Negus	
G8LAX	Mr R S Worton	07/09/05
G8SNT	Mr H Hodgkinson	03/10/05
GI2FHN	Mr E R Sandys	12/10/05
GM3WKM	Mr K G Melton	
RS19877	Mr H J George	
RS30365	Mr D Shirley	23/08/05
RS95207	Dr M M Hunt	05
SM5ADS	Mr TA Blixt	18/03/2005

COLLINS 'Gold Dust Twins' – 75A4 rcvr and KW8-1 tx plus matching 75A4 speaker with B/I Collins SWR unit and t/r relay. Superb appearance and in gwo. Rebuilt PSU, mans and spares. A magnificent rig for lovers of Collins. Buyer inspects & collects, £3500. G3GBB, 01379 783 657 (nr Diss).

COLLINS mans: 136B2 noise blanker, £2; 637T-1/2 dipole antenna, £2; engineering compendium HF antenna selection, £5. G3GBB, 01379 783 657 (nr Diss).

COMPAQ portable, three lots of floppies, £15. ZX Microdrive & interfaces, £15. Jenning Organ pedal board, £20. Telequipment scope – u/s txfmr, £10. Dennis, G0IPT, 020 8374 9070 (London). E-mail: den49@tiscali.co.uk

DISCOVERY 2m linear amp, GS-35 latest model, £900. 4 Tonna professional 2m 9-ele Yagis, 4-port splitter, cables, £200. G3KUM, 01473 735 736 (Ipswich).

DRAKE 4C rcvr fully loaded, £250. Marconi TF-2015A sig gen, £65. FRG-7 rcvr, £45. AVO meter with leather case and probes, £45. Drake MS4 speaker, £45. MFJ-259B, £65. Marconi TF-2015A sig gen, £35. Rohde & Schwarz sweep signal generator, £25. Pascal, GI0SFT, after 6pm. 028 7135 2804 (Londonderry). E-mail: pascalmcd@aol.com

DX-394 rcvr gwo, £95. Unique collectable book *Most Secret War*, having signed personal dedication and signed again on title page by Prof R V Jones, £50. Six spectral 23mm 15-turn counting dials, £15. All plus postage. Ken, MM0RZZ, (Forfar 819 063).

EC10 MkII, good cond, £75. KW Vanguard, clean and tidy, £110. Heathkit HW101 tcvr, 10W o/p, £40. Katsumi keyer, £25. Advance *Q*-meter, £25. WWII TBY-8 battery tcvr, clean & original, £50. TCS rcvr, original, works, £70. 88 set, £15. 01453 845 013 (Glos). E-mail: ken.brooks@iee.org

EDDYSTONE collector's clearout. All the following rcvrs are in working order, receiving stations all ranges and cosmetically good-to-excellent. E-mail for details and photos. Prices are ovno. Cash and collect or plus p&p. 840A, £150. EC10, £125. EC10MkII, £100. S870, £85. Also a Trio 9R-590, £45. G3XBE, e-mail: hon.sec.norc.info@ntlworld.com (Nottingham).

EVX-6000 cost, £299.95, still boxed new. Tested once. Cheque OK, £175. M0CVS, 01629 823 025 (Derbyshire). E-mail: hamradio12@btopenworld.com

HEATHKIT HW-101 incl assembly man. Mostly new valves, Works but needs attention, buyer collects, £55. G0RXG, 0117 956 8380 (Bristol).

IC-275H, £500. IC-475H plus 2 x 17-ele ant + MH preamp, £500. IC-525 (28 & 50MHz) plus 100W 50MHz linear, £400. 144 – 1296MHz tvtr, 2C39 linear plus part-built DEM 144 – 1296 tvtr kit plus 35-ele Tonna - £100. All for £1250. Buyer(s) to arrange collection. G6TTL, 01754 820 038 (Skegness). E-mail: g6ttl@orpheusmail.co.uk

ICOM 756PROIII complete with Heil head set & Icom adaptor. All complete with mans and leads as supplied. Radio purchased 6 months ago, hearing loss reason for sale at £1500. London area, buyer to collect. M0LFB, 020 7359 3841 (London).

ICOM IC-706 MkII DSP, with accessories, box, mint, £400. Icom AT180 auto-ATU, box, exc cond, £200. Kenwood TS-770 dual-band base station, multimode, mic, manual, box, vgc, £250. M0OXR, 01865 243 634 after 7pm (Oxford). E-mail: stevew@earth.ox.ac.uk

KENWOOD R-1000 rcvr, old but working well, £80. Also Sommerkamp FR-100B 0 – 30m, needs new valves and TLC. Great project for restoration, £40. Tim, MW0TJP, 01646 621 653 (S Wales).

KENWOOD TS-2000 as new in box with all mans, £900 ovno. Kenwood THD-7 h/h 2m/70cm inc APRS with speaker/mic, case etc, £165 ovno. Altai sig gen TE-200 – free. Marconi valve voltmeter TF-1041 – free. Watson on-glass mobile antenna, £10. Heil telescopic mic boom, 13 – 18 in, £12. PacComm Tiny-2 Mk2 1200/9600 baud, £40. Postage/carriage extra. Terry, G6CNQ, QTHR, 07973 195 384 (Wickford).

KENWOOD TS-570DGE HF tcvr, vgc/mint, 100W o/p, boxed, man, £520. Watson W25AM 25A PSU, £45. Sell both at £550 plus carriage. Kenwood KMC-14 & KMC-30 fist mics, £10 each plus carriage. BNOS 12V/6A PSU, meter on front, £15 plus carriage. Terry, G4OXD, QTHR, 01462 435 248 (hitchin). E-mail: tm.rose@tiscali.co.uk

CONGRATULATIONS

to the following, whom our records show as having reached 70 60, or 50 years' continuous RSGB membership:

70 years

EA6ZY	Mr S Ingram
G3LX	Mr H P Arnfield
G8VF	Mr A A Moss

60 years

G0AEW	Mr D T Arlette
G3AUB	Mr N R Paul
G3EFS	Mr W H Borland
GW2FYV	Mr M Arthur

50 years

G2AIW	Mr M E Lambeth
G3JJZ	Mr D J S Newton
G3LGA	Mr M Hayward
G3MZU	Mr F B Breedon

LINEAR Heathkit SB-1000, 1 x 3-500Z, 1000W, SSB, 850W CW, all bands 160 – 10m inc WARC, full documentation, had light use only, vgc. Prefer buyer collects, £400. Lower mast clamps with bolts for Kenpro or Yaesu rotator, £10. G3UZM, 01395 273 090 (Exmouth).

LINEAR Ranger 811H amp, boxed, used twice, purchased new end March. Going QRT, £750 ono. KW-109, £60. MC Kenwood mic, boxed, £85. G3XXO, 01909 472 316 (Worksop). E-mail: eric.birks@tesco.net

MFJ Super Hi-*Q* loop antenna, never erected, never used, £200 ono. 01664 562 044 (Melton Mowbray). E-mail: terence.murphy4@ntlworld.com

QTH for sale, large 3-bedroom Edwardian house nr Bridgend, South Wales, at 210ft ASL. Large shack, 60ft Versatower 4-ele triband. Planning consent with no restrictions on what you put on the tower. A 197ft garden. Great take off. OIRO £249,995. Michael, GW0MNP, QTHR, 01656 724 041 (Bridgend).

RADCOM complete years 1990 to 2004 incl. Free to collect or pay postage. Prefer to go as one lot. G3NYX, 01273 832 910 (near Brighton). E-mail: jwh@elayer.org.uk

RANGER 811H linear amplifier, just serviced by Ross Clare, GW3NWS, 06/10/05, top

working order, £600 ono cash. MFJ-986 tuner, vgc, offers? Both must be collected. Norman, 01291 62884 (Chepstow). E-mail: mw0hjgnorman@btinternet.com

SILENT Key Sale – Ten-Tec Jupiter tcvr, little used. Includes remote control, desk mic, power supply/speaker, also dummy load, £600 ovno. 01258 453 432 (Blandford Forum). E-mail: bvars@bvars.org.uk

SILENT Key Ten-Tec HF tcvr c/w microphone Ten-Tec HF linear 1.5kW KW-2000A c/w manual, G-400 rotator and cables, P-40 Versatower without ground post. Antique Philips 470A LW/MW radio. G4DQQ for more info, 07747 697 833.

TET 2-ele tribander, both elements fed, short boom. Only partly dismantled, inspect and collect only, £95. 01772 258 140 (nr Preston). E-mail: g3dwq@aol.com

TS-120S 100W HF tcvr, one owner, £150 ono. MFJ-949E, £75. G5RV half-size new, £10. G3NPZ, QTHR, 023 9255 0733. E-mail: terrygrif4@aol.com

YAESU FT-1000MP MkV Field, £1200. G3KUM, 01473 735 736 (Ipswich).

YAESU FT-1000MP, AC PSU, many filters, vgc, £900. SGC Smartuner SG-230 vgc, £200. G3IOE, QTHR, 0191 267 0612 (Newcastle-upon-Tyne).

YAESU FT-840. Daiwa PS-304 DC PSU. Kenwood TM-702E dual-band mobile. AEA-232MBX. AEA-232. MFJ mobile tuner MFJ-945D. MFJ Super Hi-*Q* Loop, remote control MFJ-1786 with antenna. 232 4-position switch box. Yaesu FC-700 antenna tuner. Kenwood TH-215E 2m h/h. Standard C-500 dual-band h/h. Multimode Watson WMM-3. West Mountain Radio RIGblaster. Any reasonable offers. Ron, G0LBB, QTHR, 01636 686 862 (Newark). E-mail: ronald.batty@ntlworld.com

YAESU FT-920 HF + 6m 100W, auto-ATU, exc cond boxed. All leads, man, non-smoker, £625 ono. Ian, G7MFN, 07790 230 606 (Sunderland). E-mail: ian@douglas117.freeserve.co.uk

EXCHANGE

DYMAR VHF AM radiotelephone type 940, base station with remote control and technical h/b. Swap for 2m/70cm rig? Offers? Simon, M3CAW, QTHR, 01603 872 690 (Norfolk). E-mail: simon@court-family.org.uk

ICOM 736 HF + 6m (as new) for Kenwood TS-60S & PSU. GM3TRI, QTHR, 01738 626 941 (Perth). E-mail: bertferg@blueyonder.co.uk

YAESU FT-101E, spkr, YC-100 monitor scope, YC-601 digital display, Yaesu FT-221RD 2m multimode. FT-790R 70cm. Marconi VHF sig gen. Sineadder 3 Racal freq counter and tribander TA-33. All good cond with mans, will exchange everything for good quality scanner rcvr, AOR/similar. Phone, e-mail for info. G4IJO, QTHR, 01609 883 007 (Northallerton). E-mail: graham.g4ijo@btinternet.com

WANTED

10m FM rig, Alinco DR-MO3 or similar, good price paid for clean working unit. G7PNE, 01438 232 482.

122 spy set, B2, AMKIII, MCR1, MK119. Polish WWII clandestine sets, US PCR64, German 109 or WHY? Cash waiting. Bill, G8PUJ, 020 8505 0838 (London).

GRUNDIG Yacht Boy radio, must be model 210 from between 1970 – 1974. Must be in absolutely mint cond. Will pay very good money for a set in mint cond. Peter Tankard, 01142 316 321 between 9am and 10pm (Sheffield).

ICOM-475H, Trevor, G2KF, 07974 892 179 (Cornwall).

KENWOOD VFO-230, external digital VFO for TS-830S/530S. Good price paid. G3ZQH, QTHR, 0115 921 1743 (Nottingham). E-mail: david.barrett@nottingham.ac.uk

MARCONI 2022A RF sig gen, service information wanted, man, circuit diagram etc. Andy, 2E1LGA, 01530 413 608. E-mail: andy@finch024.screaming.net

MORSE keys wanted please. Early brass keys, especially by Marconi, GPO etc, but all considered. John, G0RDO, an avid collector, 01626 206 090 (Newton). E-mail: john@morsemad.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. Tony, G4UZN, 01132 693 892 (Leeds). E-mail: g4uzn@qsl.net

GB CALLS

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 – 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Please send operational details of your special event station to the RadCom office at least five weeks before publication. The only QSL Bureau sub-manager for special event station callsigns is as follows: Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntl world.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

1 Dec	GB4YOU: Youlbury (Scouts & Guides). Boars Hill, Oxford. TLH27 (G0RJX)
	GB4YOU: Youlbury (Scouts & Guides). Boars Hill, Oxford. TLH27 (G0REL)
4 Dec	GB2ACR: Air Cadets Rochester. Rochester, Kent. TLH27 (G4EVY)
10 Dec	GB1MGD: March Guide Dogs. March, Cambs. LH2 (G0FLP)
14 Dec	GB0GMM: Glenn Miller Memorial. Ravensden, Beds. TLHV27P (M1TLK)

RALLIES

TI - Talk-In; **CP** - Car Park; **£** - admission; **OT** - Opening Time - time for disabled visitors appears first, eg (10.30/ 11am); **TS** - Trade Stands; **FM** - Flea Market; **CBS** - Car Boot Sale; **B&B** - Bring and Buy; **A** - Auction; **SIG** - Special Interest Groups; **MT** - Morse Tests; **MA** - Foundation Morse Assessments; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures/ seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

3 DECEMBER 2005

Martin Lynch & Sons' Christmas Hog Roast & Boot Fair – Guildford Street, Chertsey. sales@hamradio.co.uk [www.hamradio.co.uk]

Northern Ireland Morse Proficiency Tests – Greystoke Community Centre, Antrim. Advanced booking (>10days prior to test) necessary. John, GI3YRL, 028 9336 7208, jbranagh@supanet.com or Jim, GI0DVU, 028 9266 2270, jim.henry@ntlworld.com

4 DECEMBER 2005

BISHOP AUCKLAND RAC Rally – Spennymoor Leisure Centre. OT 10 / 10.30am, £1.50, accompanied under-14s free. B&B, C, LB, DF, FAM, TI on 144.550MHz. Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

22 JANUARY 2006

OLDHAM ARC Rally – Oldham Sports Centre, Lord Street, in the centre of Oldham. OT 10.30 / 11am. TS, B&B, TI on 145.550MHz via GB4ORC starting 7.30am. Full details and maps on website. [www.oarc.org.uk]

29 JANUARY 2006

Horncastle Radio Rally – Horncastle Youth Centre. OT 10.30am, £1. C with the famous Horncastle bacon butties, WIN. Tony, G3ZPU, 01507 527 835, tony@radioman.e7even.com

5 FEBRUARY 2006

SOUTH ESSEX ARS Mobile Radio Rally – The Paddocks, Long Road, Canvey Island, Essex (at the southernmost extremity of the A130). OT 10.30am. Radio, computers & electronics. C (home-made), CP free, TS, DF. Ken G0BBN, 01842 861 089, hendryken@aol.com [www.southessex.ars.btinternet.co.uk]

12 FEBRUARY 2006

HARWELL ARS Radio & Computing Rally – Didcot Leisure Centre, Mereland Road, Didcot, Oxon. Signposted from A34. OT 10.15 / 10.30am, £2, under-12s free. CP free, but please note that there will be less off-road parking than in previous years. C, LB, TS, SIG, DF, TI on 145.550MHz. Ann, G8NVI, 01235 816 379, ann.stevens@btinternet.com [www.hamradio.harwell.com]

WAKEFIELD & DRS Northern Cross Mobile Rally 2006 – 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, £2.50. CP, C, TS, B&B, miniature steam railway in afternoon (weather permitting). John, G7JTH, 01924 251 822.

18 / 19 FEBRUARY 2006

World Thinking Day on the Air – Liz, 023 8025 4599, liz@guides-on-the-air.co.uk

26 FEBRUARY 2006

SWANSEA ARS Amateur Radio & Computer Show – Afan Lido, Aberavon Seafront, Port Talbot, 1 mile from jn 41, M4. OT 10.30am. TS, B&B, SIG, repeater groups, C, TI on 145.550MHz. Roger, GW4HSH, 01792 404 422.

5 MARCH 2006

CAMBRIDGE & DARC Rally – John, G0GKP, 01954 200 072, j.bonner@ntlworld.com

11 MARCH 2006

SOUTH NORMANTON, ALFRETON & DARC 6th Junction 28 QRP Rally – Russell, G0OKD, 01773 783 394, russel.bradley@ntlworld.com, or Mike, M0RMJ, 01949 876 523, mike.jeffs@ntlworld.com [www.qsl.net/snadarc/]

12 MARCH 2006

ABERYSTWYTH & DARS Rally – Ray, GW7AGG, 01970 611 432, ray@clocktower.go-plus.net

BOURNEMOUTH RS 18th Annual Sale – John, G0HAT, 07719 700 771, johncbales@yahoo.co.uk [www.brswebsite.freeserve.co.uk]

WYTHALL RC 21st Radio & Computer Rally – Chris, G0EYO, 07710 412 819 or g0eyo@blueyonder.co.uk [www.wrcrally.co.uk]

19 MARCH 2006

NORTHERN AMATEUR RADIO SOCIETIES' ASSOCIATION (NARSA) Norbreck Blackpool Rally – Peter, G6CGF, 0151 630 5790, g6cgf.peter@ntlworld.com

1 APRIL 2006

GMDX Convention 2006 – Robert, GM3YTS, gm3yts@btinternet.com

9 APRIL 2006

22nd Yeovil QRP Convention – George Davis, 01935 425 669, george@mudford.fstnet.co.uk

16 APRIL 2006

West London Radio & Electronics Show – Paul, M0CJX, 01737 279 108, m0cjx@radiofairs.co.uk [www.radiofairs.co.uk]

1 MAY 2006

DARTMOOR RC Radio Rally – Rob, 2E0ONO, 01752 773 711/

MID-CHESHIRE ARS Rally – David, G4XUV, 01606 77787.

19 – 21 MAY 2006

55th Hamvention – Dayton, Ohio. [www.hamvention.com]

4 JUNE 2006

SPALDING & DARS Annual Rally – Ambrose, M0DJA, 07989 636 520. [www.sdars.org.uk]

18 JUNE 2006

NEWBURY DARS Car Boot Sale – Kevin, G6FOP, g5xv@ntlworld.com [www.nadars.org.uk]

23 – 25 JUNE 2006

Hamtronic Friedrichshafen – [www.messe-friedrichshafen.de]

25 JUNE 2006

West of England Radio Rally – Shaun, G8VPG, 01225 873 098, rallymanager@westrally.org.uk [www.westrally.org.uk]

13 AUGUST 2006

FLIGHT REFUELLING ARS Hamfest – Mike, M0MJS, 01202 883 479, hamfest@frars.org.uk [www.frars.org.uk]

19 NOVEMBER 2006

West London Radio & Electronics Show – Paul, M0CJX, 01737 279 108, m0cjx@radiofairs.co.uk [www.radiofairs.co.uk]

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement in this section should use the official form printed in *RadCom* each month and send it to 'Memads', *RadCom*, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. No acknowledgement 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*. **The RSGB believes that it is inappropriate for members trading in whatever way in radio equipment to place members' advertisements. We therefore regret that we are unable to take such advertisements, although we do welcome these in the 'Classified' advertising section of *RadCom*.** The editor reserves the right to refuse any advertisement for any reason. In such matters, the editor's decision is final.

The RSGB 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. Members may submit *one* photograph of equipment being sold / wanted at an additional cost of £5.00. This *must* be a .jpg or .gif file and the file name *must* be included on the Order Form. The photograph may be e-mailed to radcom@rsgb.org.uk or sent on a floppy disk or CD.

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 Danby Advertising (advertising agents). The closing date for copy is the first day of the month prior to publication, e.g. the deadline for the May issue is 1 April.

Warning: ***Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid. Members' Ads also appear on the members-only website: www.rsgb.org/membersonly/membersads***

The Members' Ads order form is published below. If members do not wish to cut the form out of the magazine, photocopies will be accepted, as will recent copies of the form from previous months. 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 way.

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 *Radcom*

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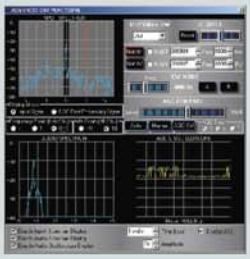

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Feeling the squeeze

From: Ron Keefe, G4SIS

I have been a member of the RSGB for 23 years and never had reason to complain. I refer to weekend contests which have now taken up the whole 40m band with no regard for band plan. This is just not acceptable. Does this mean that CW operators are to become part time amateurs? Surely, I do not need to remind the RSGB that our hobby started with CW.

I monitored on Saturday 29 and Sunday 30 October at different times of the day and found that the complete band from 7MHz to 7.1MHz had been taken up by SSB contest stations exchanging 59 and 73 – just number collecting.

If this is the path that amateur radio is taking, then perhaps it is time I threw in the towel. I know I speak for every CW operator in demanding the RSGB does something about this blatant intrusion of our very small portion of the 40m band.

Feeling the squeeze – response

From: Colin Thomas, G3PSM, spectrum director

Ron Keefe has not discovered anything new but what he has come across is the phenomena of the CQ World Wide Contest, or at least one of them. The SSB contest takes place on the last weekend of every October and has done so for as long as I have been licensed (45 years). These series of contests are normally the subject of an agenda item in the tri-annual IARU Region 1 Conferences and this year was no exception with one Region 1 Society wishing to introduce "dynamic band planning" during the 48 hour period of these contests: ie no band planning. This proposal found little support.

The CQWW Contests are not run by a national society or special interest group but by a commercial amateur radio magazine publishing company. Providing the participants abide by their licence conditions then this is acceptable by the organisers. Remembering that the band plans are a gentlemen's agreement, a bid to try and avoid chaos reigning appears to be secondary in this case and efforts made by national radio societies worldwide to have the organisers modify their rules have been unsuccessful.

Mr Keefe may be interested in Recommendation C4_Rec_25 which was agreed at the IARU Region 1 Conference in September – non-contesting radio amateurs are recommended to use the contest-free HF bands (30, 17 and 12m) during the largest international contests. If it is any consolation to Mr Keefe, the 48 hour CQWW CW contest takes place during the last weekend in November!

In defence of valves

From: Robert Kerr, GM4FDT

I wish to comment on the letters of Brian Clowes, GW4HBZ, and of Colin, G3SBI, with regards Technical Topics and valves. How many of these solid-state wonders will be serviceable in 60 years. My old T1154 base station 1,200V PSU still powers my LG300. It was built in 1940 and has had the rectifiers and bleeder resistors replaced. Four PY500 valves pulled from scrap TV sets replaced the Selenium rectifiers and modern 22K 50W metal clad resistors replaced the o/c green vitreous loading resistors. This was a cheap repair.

I thoroughly endorse Colin's comments. Technical Topics has been an inspiration for me since before I bought Amateur Radio Techniques Fourth Edition back in the 1970s. Thanks Pat.

I too really began to appreciate good receiver dynamic range when I fitted G3LLL's modifications to the front end of a much-loved FT101EE. The circuitry involved a Gilbert Cell Mixer IC – the famous SL6440. The result was amazing, particularly on 40m in the evenings. I like these older rigs with valve drives and PA stages. I can fix them myself.

Finally, please do not knock Technical Topics and be kind to eccentrics like myself who try to reverse engineer FET circuits to valves – valves are sometimes described as depletion FETs with pilot lights and low capacities.

Bad manners

From: Ralph Kelly, MM0ODI

I was disgusted to read about the operator who had been verbally abused by other licence holders. I have two questions. Who was responsible? Why do they still have a licence?

This sort of thing should be a zero tolerance issue. I have only held a licence for one year but in that time I've been dismayed by the attitude of some operators on the air. Tuning up by whistling on frequency while people are trying to conduct a QSO under sometimes poor conditions and constantly shouting callsigns in a pileup when the recipient has obviously taken another call are only two of many breaches of etiquette I've found to be all too common.

I thought I'd left bad manners behind when I got rid of my CB many years ago but it seems, sadly, I was wrong. Everyone with a licence has worked hard to get on air, so why not exhibit a bit of professionalism when you're behind the mic?

Not everyone is rude

From: Jackie Humphrey, M3TBW

I have read several letters in *RadCom* about bad manners by operators. To help redress this, I would like to say a big thank you to all the operators who tried to help me on Saturday 22 October. I had gone up onto the downs above Eastbourne to try to contact the special event station GB200T at Greenwich. As I was operating mobile and with so many other, and stronger, stations calling in, I was having trouble making myself heard. However, I heard many stations telling the operator at Greenwich that they could hear a YL mobile station calling in and the operator at Greenwich, Ralph, on several occasions listened out specifically for me though for a couple of hours he just couldn't hear my signal.

I am pleased to say that I eventually got through and I would like to say a big thank you to every operator that told the special event station that I was calling and to Ralph particularly for listening out for my call. There may well be bad operators out there but I can assure you that there are also plenty of very helpful ones too.

Antenna adventure

From: Martin Lynch & Sons

When ARNO Electronica, manufacturer of EH Antennas, asked Martin Lynch & Sons to organise a raffle prize for the RSGB's 2005 HF Convention, little did the company know how many twists and turns there would be.

The prize was an ARNO Venus-80 antenna covering the whole of the 80m band in a compact length of only 248cm. However, the antenna had been loaned to the RSGB for review in early 2003 by HR Henly, G3IHR, who unfortunately died before completing his write-ups. The antenna was installed at G3IHR's premises and it was almost two years before it was finally retrieved by Mike, G3LHZ, who drove all the way from Surrey to Swindon to collect it from Mr Henly's local radio club. Mike used the antenna for tests to assist in an antenna forum held at the 2005 HF Convention.

The antenna was then lent to the Crawley ARC for use during the HF Convention. But soon after it had been erected it fell to the ground with an almighty thud. One of the back stay guy wires had come adrift and the vertical installation was very definitely horizontal (ground wave was increased no end!). The Crawley Club quickly re-erected the antenna and to everyone's surprise the antenna still worked, though it was a little marked after its ordeal.

When it came to the prize giving at the HF Convention, the winner turned out to be Rich, K2WR, from New York. The photo says it all. Rich was very pleased he had won the EH Antenna but wondered how he was going to get a 7ft box on the plane? He decided therefore to donate it to the Jersey Amateur Radio Society, with which he has been a member for over ten years.

The antenna is now on its way after being glued back together by the ML&S workshop. It may look a little battle scarred but it still works very well and at least has an interesting history. Let's just hope it makes it safely to the final destination!

Sound of silence

From: Lawrence Woolf, GJ3RAX

This afternoon I found that the nasty noise on 40m, on 7.145 MHz, had vanished. I checked the DRM website and found that the digital version of Radio Luxembourg was now on 7.295 MHz. It is still just as strong and wide on that frequency but it is now out of our new part of the band.

Far-sighted design

From: Alan Ralph

I recently purchased an Icom Handheld IC-E90 from Martin Lynch & Sons and found it had a very useful feature for blind people in that it can read the display frequency to you in Morse code. (This can be adjusted from 10 to 25 words per minute). The handheld is triband (2M/6M/70cm) with general coverage receive (AM/FM/WBFM).

To set it up, you need a sighted person to turn on the CW function, set the CW speed, activate the tone burst and program the memories. Once this is done, it should be possible to operate the rig either by using the VFO, direct frequency entry from the keypad, or operating from memory mode. To ensure I know what the first memory is, I programmed BBC5 Live into it, and then a click of the rotary dial will step through each memory in turn. Just to check that you know where you are, you can press and hold the band button to read you the frequency in CW.

Two of my blind friends, G3ZGG and G4ZGG, are going to give it a try, since they have been looking for a "talking" handheld. This comes close to meeting their needs, even if it is in CW! The Lithium Ion supplied battery provides excellent endurance. The button '5' even has a raised pip on it.

Is this the best-kept secret for the visually impaired? What would be nice is a manual in Braille, or as I did today, a read-out of the main function of each button (eg quick push) and its secondary function (eg hold for one second) onto audiotape.

QRM problem – response

From: Don Pinnock, G3HVA

As a corresponding member of the EMC committee, I am very concerned about the severe QRM which Peter Dodd, G3LDO, has suffered on 14MHz for the past two years (Last Word, November 2005), especially as it is becoming worse and spreading to the 10 and 18MHz bands. One only has to listen on 80 and 40m for a few hours each week to realise that this type of problem is not uncommon!

Although the QRM appears to have many sources, I can say from first-hand experience that it almost certainly originates from a single source. The so-called hot spots at telephone distribution poles and other locations which Peter refers to are merely manifestations of the QRM, ie points where it can make itself heard. After all, what better medium for noise distribution than a horizontal or vertical radiator or even house wiring!

The first task is to find the general locality of the source. This can only be done by direction-finding. Peter's beam antenna cannot be used for this purpose because it is very near to one of the many so-called hot spots. He must therefore set up a loop antenna in an open space, a park for example, and take a bearing on the noise. It is good practice to take a null and then add or subtract 90^0. Once he has ascertained the direction of the QRM, he must then select a similar open

space at right-angles to the line, and take another bearing to obtain a fix. This will be the approximate location of the noise source.

The use of a small sensitive all-band receiver and whip antenna at the approximate location may well reveal QRM at frequencies higher than 14 and 18MHz. If so, it will merely be necessary to "wind up" the frequency while walking until a point is reached where the QRM is at its highest frequency. This will be the noise source!

I hope that Peter does not waste endless time by trying to analyse the noise itself. Even if he becomes 100% certain that it originates from, say, an unsuppressed motor, he will still have to find the motor. In any case, nobody is better equipped than he is for designing a portable direction finding antenna!

Following my own experience at several locations, I can safely recommend the Wellbrook loop antennas. They are robust, work off a 12V car battery, and do not require tuning since they have a substantially flat response from 100kHz to 30MHz. They can be used not only for direction-finding, but as a very effective back-up for the main antenna (on receive only) when the elimination of local noise and co-channel QRM is an important consideration.

Kept in the loop

From: Mike Underhill, G3LHZ

You cannot expect me to share Pat Hawker's confidence (Technical Topics, November 2005) that Alan Boswell's recent paper in IEEE A&P Magazine represents the "final final words" on loops. Although it has appeared in a reputable refereed engineering journal, I believe that it fails to answer the central question of "where does the RF go?"

Jack Belrose suggests as much in his June 2005 *RadCom* article on "Electrically Small Transmitting Loops". What he says is essentially that all 'inexplicable' loop loss should be assigned to being capacitor loss to make sure that NEC can be seen to work for loops!

Until the key 'traceability' or accountability question "where does the RF go?" is answered, the requirements of the First Law of Thermodynamics (the energy conservation law) are not fulfilled for small loops. Unfortunately for Alan, when the question is answered, we find that the predictions of the Chu-Wheeler theory and NEC are not compatible with the First Law of Thermodynamics for small loop antennas. Heat measurements incontrovertibly demonstrate that this is so. Thus everyone will have to choose between the Chu-Wheeler criterion and the First Law of Thermodynamics. There is no other choice in this case.

You may ask why Alan's evidence is insufficient: (a) He has done no heat loss experiments or measurements to find out and confirm "where the 'lost' RF energy goes"; (b) He has done Q measurements at only four frequencies. This only allows three unknown loss and radiation resistances to be separated and measured. Thus, the number of independent parameters that can be extracted is less than the number of loss and radiation resistances that have to be taken into account. This is mathematically 'insufficient' for the 'confirmation' that is claimed. In fact, based on the evidence presented, the conclusions of his paper could easily be reversed.

No cause for concern

From: Peter Dodd, G3LDO

G3HQT's discovery of RF current everywhere (Ignorance is bliss, The Last Word, September 2005) should not be a cause for concern. Any conductive object in the vicinity of a transmitting antenna will absorb RF and re-radiate it. This applies to earth beneath the antenna, where the re-radiated RF contributes to elevation gain at certain angles.

It follows that all metal objects around the house will re-radiate RF but generally these currents are small and don't have much affect on antenna performance. If these currents are large then positioning the antenna higher or/and further away from the house might be beneficial.

The current meter can be useful in measuring the RF current on the outside of coaxial cable and noting any improvement when a current balun is fitted.

EMC problem solved

From: Andy Hewitt, G3SVD

I am the RSGB member referred to in the EMC feature (P84 October 2005). Actually I am licensed as G3SVD and run up to 400W on all bands 80-6m, various modes. The problem referred to in the article was caused when running almost any power level on 160 and 80m and was cured by the installation of the filter by the BT experts as described and I could in fact run up to the legal limit without suffering a disconnection. My family could now happily use the internet and I could monitor the cluster and operate, all at the same time – Heaven!

However, recently the problem reappeared when my broadband service was upgraded from nominal 550K to 1Meg last June. In this case, I did not advise the EMC committee, nor BT, as the principal problem was in making any connection to the broadband service at all and then staying connected without any EMC considerations. Now, as well as losing the connection when I transmitted on the LF bands, mainly 80m, the connection was very unreliable at all times whether or not I was operating. It was difficult to connect and also unreliable when connected. I reported this unreliable connection to BT during August. BT measured the S/N ratio on the line remotely from its offices in Cardiff. This was found to be between 0 and 5dB. BT normally expects 15-18dB.

An engineer was sent at the beginning of September. He found that the S/N ratio was 20dB at the point of entry into the house (the master socket) but 5dB in my shack, where the main PC, together with the ADSL modem and the router for the family's LAN connections, are located remote from the master socket. He then rewired the extension phone connections around the house in exactly the same manner as suggested in Fig 3 of the article, actually using cable pairs that were spare in the existing cabling.

The engineer also fitted a new front plate incorporating an ADSL filter to the socket in the shack. This is labeled "ADSL v10" but I have no details of this item. These modifications resulted in about 18dB S/N at the PC and both problems apparently solved. I am still using the new type front plate on the master socket and in the shack, the special filter provided by Trevor Morseman and Kevin Foster from BT together with a common mode filter of about 12 turns wound onto a RSGB ferrite ring fitted between the shack front plate and the ADSL modem. This last item was always in place even before the first problem was detected. I hope that this additional information will be of interest to other members who could be experiencing similar difficulties. ♦

WATERS & STANTON

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A Waters & Stanton CHRISTMAS PRESENT

High Sierra Antenna's **SIDEKICK**

80m - 6m Mag Mount Mobile*
Remote Control Tuning
Just 4.5ft long - huge efficient coil

9 Bands 200W

* 3.5-60MHz
* 1.5:1 or less typical SWR
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No other auto antenna has this frequency range, compact size or efficiency.

£249.95 C

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The W-300T Triple Magnetic Mount comprises 3 x 127mm magnetic mounts and accepts 3/8in stud mount antennas. The W-300T version has 3/8in socket. Supplied with 5m of coax cable with PL-259 plug. Super adhesion and stylish black finish

Watson Headset

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WATSON WEP-601

Adjustable Headset with Boom Mic.
*Heavy Duty
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*Earbud type earpiece
*Adjusts for left or right ear
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*Choice of Connectors
*32 Ohm earpiece
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FUJIKON NC-2

FUJIKON NC-4

These Active Noise Cancelling Headphones, from Fujikon, blockout annoying ambient background noise. Powered by an AAA battery noise cancelling is controlled by an on/off switch. NC-4 has a folding design for easy storage.

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ADONIS AM-708

*Electret condenser mic.
*FM/SSB quality selection
*2 transceiver operation
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*Up/Down Buttons
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Electret Condenser Mic with built-in preamp

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MD-100A8X £116.95 C
Base Mic suitable for SSB & FM transceivers

MD-200A8X £254.95 C
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Icom Desk Microphones

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Heil Desk Microphones

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The Heil Classic mic, an exact replica of the 30's RCA 74B broadcast mic. Inside it has modern technology, two inserts are provided, one for broadcast studio quality and a choice of one other Heil insert (HCL-4, HCL-5 or HCLiC).

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Hand Mic with studio insert for Icom users

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Professional Large Diaphragm Condenser Mic

Watson Headsets

WATSON HP-100

Excellent lightweight communication headphones with tailored response ideal for the modern transceiver or receiver.
*8 Ohms 200-9,000Hz
*Adjustable headband
*3.5mm stereo plug *1/4" stereo adaptor.

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HP-200 £22.95 B
Superb headphones with padded earpieces

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Versatile Earpiece with boom mic

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Clip over earpiece & clip on lapel mic

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Mobile mic system for the car

Heil Headsets

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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.

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PRO-SET £99.95 B
Headset with boom mic, choice of HC-4 or HC-5 insert, please state when ordering

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Heil Traveler for mobile use, single earpiece with mic, available for IC-706, Icom 8pin, Kenwood 8pin, Kenwood mod, FT-817.

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Heil Traveler Dual Sided Headset Boom Mic. Available for Icom, Kenwood & Handhelds.

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Latest from Heil, boom mic headset with acoustic noise cancelling headphones to exclude outside noises & improve received sound. Choice of HC-4, HC-5 or Icom elements, Icom el. at addtional cost.

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QUIET PHONES (Q-PHONE)

Ambient noise reduction headphones, all external noise below 400Hz is gone! 1/8" headphone connector allows use with minidisc, cd or mp3 and 1/4" adaptor allows use with amateur radio transceivers. In-line battery holder uses 1xAA cell.

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bhi DSP Equipment

bhi NES10-2 MkII

NES10-2 Combined speaker and programmable DSP unit. Offers dramatic noise reduction, even reduces annoying hetrodynes. Power On/Off switch with audio bypass, 8 Ohms, 8 filter settings, 3.5mm plug, 12-24V DC.

£99.95 B

NES-5 £79.95 B
DSP Speaker Basic Plug & Go model

NEIM-1031 £129.95 B
Noise Eliminating In-Line Module with DSP

1042 £19.95 A
Switch box allowing up to 6 items to connect to one bhi speaker/module.

NEDSP-1061-PCB £79.95 B
Small DSP PCB modulefor retrofitting into rigs

NEDSP-1062-KBD £99.95 A
As NEDSP-1062 but with small keyboard

NCH £34.95 B
ANR Noise Cancelling headphones

SGC DSP Equipment

SGC ADSP-2-EXT

Speaker with built-in ADSP noise filters. 3 modes selectable.
1)no reduction
2)original ADSP
3)New ADSP2 noise reduction.

£69.95 B

ADSP-2-LLK £89.95 C
ADSP2 Low Level (70-11) Audio Power Kit

ADSP-2-HLK £89.95 C
ADSP2 High Level (70-12) Audio Power Kit

Graphic Equalisers

BEHRINGER UB-802A

Dual Mic graphic equaliser with dual **variable 60dB pre-amps** plus 2 x mon/stereo line inputs.Configure to adjust both tx & rx audio and monitor both through phones. Professional quality features low-mid-hi, tape in/out, 1/4" jack and XLR sockets, 48V for condenser mics etc. **Plus FREE AC adaptor.**
In/out adaptor sets for 8-pin mics: K-802, Y-802, I802 £19.95

£54.95 B

W2IHY W2-EDGE

The W2IHY is an 8-band graphic equaliser, plus noise gate specifically designed with radio communications in mind. The graphic equaliser covers 8-bands between 50Hz and 3200Hz - the typical range for SSB. This enables you to finely adjust the audio response to improve your mic and match your radio.

£199.95 B

Carriage Charges: A=£3, B=£6, C=£10

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*9.7 - 17V DC (13.8v notch) *Input 230V or 115V AC *25 Amps peak, 22 Amps cont. *Fan cooled *Dual output terminals *Dual metering volts & current *Over voltage & current protect *Removable AC lead *Illuminated metering *Protection warning light *1.65kg *170w x 180d x 65h mm

£99.95 C

W-3A £22.95 B
Output 3A, 13.8V DC, supply 230V AC

W-5A £29.95 B
Output 5A, 13.8V DC, supply 230V AC

W-10AM £59.95 C
Output 10A, 0-15V DC, supply 230V AC

W-25AM £89.95 C
Output 25A, 0-15V DC, Dual meters

W-30AM £119.95 C
Output 30A, 0-15V DC, Dual meters

W-25SM £79.95 B
Output 22A (25peak), 13.8V DC, supply 230V / 115V AC

PS-122 £21.95 B
Output 2.2A, 13.8V DC, supply 230V AC

Manson Power Supplies

MANSON EP-925

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

£99.95 C

Diamond Power Supplies

DIAMOND GSV-3000

*Output voltage: 1 - 15V DC *Output current 30A continuous *Built-in cooling fan *Supply 230V AC 50Hz *Size 250 x 150 x 240mm *Weight 9kg

£149.95 C

GZV-2500 £119.95 C
Output 25A, 5-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 22cm

GZV-4000 £159.95 C
Output 40A, 5-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 30cm

GZV-6000 £299.95 C
Output 60A, 1-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 36cm

Ni-MH Batteries

NXC-4AA £4.95 B
4xAA Rechargeable Nickel Metal Hydride Cells

NXC-4AAA £4.95 B
4xAAA Rechargeable Nickel Metal Hydride Cells

NXC-CHG £5.95 B
Ni-Cd/Ni-MH Battery Charger charge 2/4 cells

West Mountain DC Distribution

RIGRUNNER 4008

The *RIGrunner* 8-way 13.8V DC distribution system with Over voltage, Normal and Under voltage indicators. Nine pairs of outputs in four groups - 25A, 10A, 5A and 1A all individually fused. Requires 13.8V DC power source either from battery or mains power supply with current rating up to 40A.

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RR/4012/C £89.95 B
12-way 13.8V DC (25A,10A,5A,1A)

RR/4010/SG £109.95 B
10-way 13.8V DC (25A,10A,5A,1A)

RR/4005/C £49.95 B
5-way 13.8V DC (25A,10A,5A,1A)

Spare Power Pole Connectors

C15/PK/12 NEW £11.95 B
15A Pack of 12 pairs

C30/PK/12 £11.95 B
30A Pack of 12 Pairs

C45/PK/12 NEW £13.95 B
45A Pack of 12 Pairs

Watson Power Meters

WATSON W-220

*1.6 - 200MHz *0-5W / 0-20W / 0-200W (max power 200W) *SO-239 *50 Ohms *Size 190 x 85 x135mm *Weight 790g *Accessories: DC lead for 12V illumination

£49.95 B

W-420 £49.95 B
118-530MHz, 0-5, 0-20, 0-200W, SO-239

W-620 £89.95 B
1.6-530MHz, 0-5, 0-20, 0-200W, SO-239

Avair Power Meters

AVAIR AV-201

Ideal for HF and VHF operation. It features high power handling up to 1kW * 1.8-160MHz * 5W, 20W, 200W, 1kW * Av or PEP

£49.95 B

AV-400 £49.95 B
140-525MHz, 5W, 20W, 200W, 400W

AV-601 £69.95 B
1.8-160MHz(S1), 140-525MHz(S2)

AV-1000 £79.95 B
1.8-160MHz, 430-450MHz, 800-930MHz, 1240-1300MHz. 5W, 20W, 200W, 400W

AVAIR AV-20

*3.5-150MHz **(AV-20)** *Impedance 50 Ohms *Power 0 - 15W / 0 - 300W switched *Measures forward / reflected power + VSWR *Sensitivity 3W for full scale deflection *Accuracy 10% at full scale *Sockets SO-239 *Size 85 x 87 x 95mm *Weight 280g

£29.95 B

AV-40 £29.95 B
144-470MHz, power 0-15W/0-150W switched

Watson Frequency Counters

WATSON HUNTER

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

£49.95 B

FC-130 £59.95 B
1MHz-3GHz, 10 digit readout

SUPER SEARCHER £99.95 B
10MHz-3GHz, 7 digit readout

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10Hz-3GHz, 10 digit readout

Optoelectronics Frequency Counters

OPTOELECTRONICS SCOUT

The Scout automatically stores frequencies as it locks onto them, and logs the number of hits for any one channel. It incorporates both digital filter and auto capture. The Scout can also Reaction Tune various receivers with a suitable optional cable. RT-8200 for AR8200 Series-2 and SAC-8000 for AR8000.

£299.95 B

CUB £129.95 B
Mini Counter 1MHz-2.8GHz, 9 digit readout

MFJ Coax Switches

MFJ-1702C

*2-way *Connectors SO-239 * < 0.2dB loss *SWR < 1.2:1 *Isolation 60dB at 300MHz 50dB at 450MHz

£28.95 A

MFJ-1704 £59.95 B
4-way, Connectors SO-239 or 'N'

MFJ-1700C £89.95 B
6-position antenna swirtch, SO-239

MFJ-1701 £52.95 B
6-way, range 1.8-30MHz, SO-239

Watson Coax Switches

WATSON CX-201

*2-way *Connectors SO-239 *Power 2.5kW *Range DC - 600MHz *Impedance 50 Ohms *Loss 0.1dB

£18.95 A

CS-600 £12.95 A
2-way, Connectors SO-239, Power 2.5kW

DL-300M 300W Dummy Load

Every station needs one!

A convenient way of testing your rig and measuring power etc. DC - 150MHz, 300W. Requires 50 Ohm patch lead. **DL-300MN** "N" socket **£48.95B**

£46.95 B

Duplexers

DIAMOND MX-72

*1.6MHz - 150MHz 400W PEP *400MHz - 460MHz 250W PEP *Max loss 0.3dB *SO-239 to 2 x PL-259 *Cable length 200mm to plug *45 x 42 x 25mm approx.

£32.95 B

NEW

DIAMOND MX-72A £39.95 B
Duplexer "N" Type, 1x 'N' Plug + PL-259

DIAMOND MX-62M £49.95 B
Port1: HF + 6m Port 2: 2m + 70cm

DIAMOND MX-610 £54.95 B
Port 1: HF Port 2: 6m + 2m + 70cm

WATSON WD-25 £24.95 A
Port1:HF+6m+2m Port2:70cm, SO-239 sockets

WATSON WD-24 £22.95 A
As WD-25, SO-239 and dual PL-259

WATSON WD-24N £24.95 A
As WD-25, SO-239, PL-259, N-type

Diamond Triplexers

DIAMOND MX-2000

*1.6 - 60MHz 800W PEP Loss 0.15dB *110 - 170MHz 800W PEP Low 0.2dB *300 - 950MHz 500W PEP Low 0.25dB *SO-239 socket & 3 x PL-259 plugs *Cable length 300mm to plug. *65 x 85 x 23mm approx.

£59.95 B

MX-3000 £59.95 B
Port1:HF+6m+2m Port2:70cm Port3:23cm

DCI Band Pass Filters

Razor Sharp Professional Filtering

DCI-145-2H £119.95 B
144 - 146MHz 68dB @ 136MHz / 55dB @ 155MHz. Less than 1dB loss. 200W. 30 x 8 x 13cm SO-239

DCI-145-2HN £129.95 B
144 - 146MHz 68dB @ 136MHz / 55dB @ 155MHz. Less than 1dB loss. 200W. 30 x 8 x 13cm N socket

DCI-435-10C £139.95 B
430 - 440MHz 47dB @ 415MHz / 50dB @ 455MHz. Less than 1dB loss. 200W. 30 x 8 x 19cm N socket

DCI-145/435-DB £199.95 B
This has similar performance to above 2m and 70cm individual filters. 200W Duplexer inside. N socket. Designed for single coax dual band operation.

Kuranishi Antenna Analysers NEW

KURANISHI LA-310

This is a professional grade frequency counter and field strength meter and matches the BR-210 and BR-510 series of analysers. *10MHz - 2500MHz (3 ranges) *New Pre-Amp increases sensitivity by 20dB

£399.95 C

BR-210 £359.95 C
Antenna Analyser 1.8-170MHz in 6 bands

BR-400 £369.95 C
Antenna Analyser 100-170MHz, 300-500MHz

BR-510A £439.95 C
Antenna Analyser 1.8-170MHz, 300-500MHz

BR-510D £479.95 C
As BR-510A, covers improved ranges

Carriage Charges: A=£3, B=£6, C=£10

50/144/430MHz 5W FM Transceiver

VX-7R

ULTRA-RUGGED SUBMERSIBLE TRI-BAND HANDIE

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The VX-7R rugged magnesium case, keypad, speaker and connectors are carefully sealed to protect the internal circuitry against water damage and is rated for 30 mins of submersion at a depth of up to 3 feet.

DUAL RECEIVE

The VX-7R is capable of four modes of Dual Receive. Two VHF frequencies, Two UHF frequencies, One VHF and One UHF frequency, or One General Coverage and One Amateur frequency, all equipped with call received muting.

WIDE FREQUENCY COVERAGE

Continuous AM/FM coverage of 500 kHz to 999 MHz, the VX-7R is ideal for monitoring HF Shortwave Broadcasts, AM and FM Broadcasts and Marine and Public Safety Bands.

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The VX-7R has over 900 memory channels with a, capacity for Alpha-Numeric labelling. These include 450 Main Memories, 10 One-Touch, 40 Programmable Memory Scan, 12 Home Channel, 89 Shortwave Broadcast Station, 280 Marine Channels and 10 Hyper Memories.

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