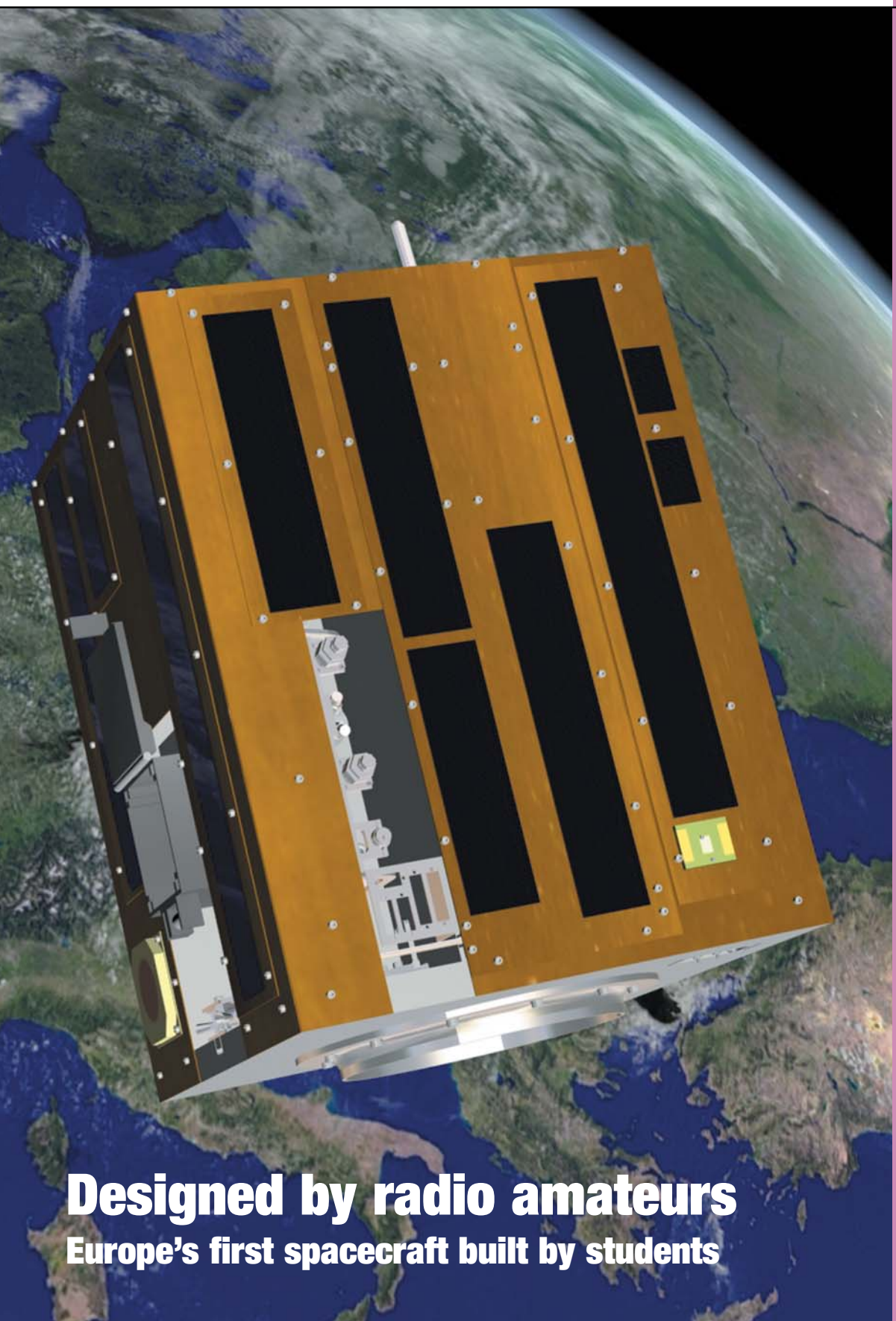
www.rsgb.org

The Radio Society of Great Britain Members' Magazine

RadCom

£3.95 Vol 81 No. 9 September 2005



Designed by radio amateurs

Europe's first spacecraft built by students

INSIDE

WATERS & STANTON

UK'S L

New Matlock Opening Hours: 9am-5pm Tuesday to Friday, 10am-4pm Saturday, Closed Monday

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS ENQUIRIES: 01702 206835/204965 FAX: 01702 205843
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SPECIAL THIS MONTH

Icom's Fabulous IC-7800 200W Transceiver with *FREE*
Matching SP-20 Speaker worth £165
No Deposit 12 months interest free finance
All this for.... **£6400**

Garmin C320 GPS

Car Navigation System

3.5" 16-colour screen pre-loaded with UK & Ireland Street maps!

Touch Screen - Speech Prompts - Route in Seconds - ETA and Speed - Built-in antenna - Screen Suction System - Quick Release - Internal Lithium Pack for out-of-car route planning - 12V Cigar Lead - USB cable - Europe Route Maps on CD - 128Mb Card - Auto Zoom - Future Map updates via Garmin

Ready to go from box!

£399.95 B

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.

CALL FREEPHONE SALES 08000 73 73 88

Visit our eBay shop for more bargains!

eBay

Go to www.wsplc.com then click on the link to our eBay shop

PAY NOTHING 'TIL 2006!

BUY NOW PAY LATER AT ALL 3 STORES

AVAILABLE ON ALL SALES OVER £200

You won't find a better deal!

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

0% APR Typical example of buy now pay later. Cash price £600. Pay no deposit and pay the full amount by the due date. Pay no interest.

OR

29.8% APR Repay £31.53 per month for 36 months, after the 12 month period. Total amount due £1135.08. Interest is calulated from the date of the agreement.

All finance subject to status written quotation on request.

Saturday 10th September

Stalls from Icom, Kenwood, Yaesu, the RSGB FunBus, and a Boot Sale too! Starts at 10am

LOWE OPEN DAY

Spend the Day in Matlock in the Beautiful Derbyshire Dales

FREE BOOT SALE
Just call Peter Waters on - 01702 203353 to book pitch.

FAST SAME-DAY DESPATCH

www.wsplc.com

GREAT AFTER-SALES SERVICE

FREEPHONE ORDER LINE **08000 73 73 88**

NEW HANDS-FREE MOBILE SYSTEM

Available end of September

Supplied with easily detachable lead to match your radio - so you can change radios in the future with ease!

Delivery expected in July

More Great Ideas!

£39.95

Code WM-S

An economical way of staying legal. Flexible boom microphone mounts under sun vizor bolt and PTT box mounts on gear changer. All powered from rig mic socket!

PTT Box

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 £1299 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. **£1389 C**

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

TS-2000X £1799 C
Take the TS-2000 and add a superb 23cm module. The best 23cm we know of plus all other bands!

TS-B2000 £1299 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 £729 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 output 160m - 70cm. New low price. UK warranty.

FT-817DSP £589 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

OWEST PRICES

ZERO DEPOSIT ZERO INTEREST

Enquiries 01702 206835

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*
£239 C

IC-910H £1099 C
2m / 70cm 100W Base station all - modes with option for 23cm module (**UX-910 £359**)

IC-910HX £1249 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. **£439 C**

TM-G707E £269 C
Dual Band 2m & 70cm with detachable front

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

TM-271E £189 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 £159 C
*2m FM Mobile transceiver * High power 65W * Capable of VHF wideband receiver

FT-8800E £269 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

Programme all your radio's functions and memories in a fraction of the time using Windows - - - - - and save to disc!

+ FREE PC RADIO DATA LEAD

Versions available for: FT-857/FT-897, FT-817, FT-8800, FT-8900, FT-7800, FT-2800, FT-60E, VX-7 (needs CT-91), VX-6E, VX-2E, VX110/150, VR-500

State model when ordering

£39.95 A

Icom
VHF/UHF Handhelds

IC-E90 Special!

The new E-90 offers triple band coverage of 6m, 2m and 70cms. Up to 5W output and rx coverage from 495kHz - 999MHz makes this a very attractive rig.
£199 B

NEW IC-V82 Digital Handy NEW
Now in Stock! **£159 B**

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.
£239 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-6E NEW

2m / 70cm Handheld Transceiver, Wideband receive including AM Airband. Plus a Built-In Morse Tutor.
In Stock Now! **£199 C**

VX-7R £269 C
6m/2m/70cm handheld with huge 132x64 dot matrix display, choose black or silver

VX-2E £119 C
2m/70cm miniature handheld transceiver with LiON battery/charger

VX-110 £94 C
2m handheld transceiver with 8-key keypad NiCd & charger

VX-150 £99 C
2m handheld transceiver with 16-key keypad NiCd & charger

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

Linear Amp UK
HF Linear Amplifiers

RANGER 811H

**1.8 - 29.7MHz*
**800W CW or SSB, 400W RTTY*
**Uses 4 x811A vertically mounted*
**Drive 10 - 100W*
**Toroidial AC Power Transformer*
**6:1 Reduction Drive on Tuning Controls *"Near Silent" Papst Cooling fan *Front-panel ALC Adjust Control *Built-in AC 230V @ 8A Supply*
£945 B

CHALLENGER III £1795 C
HF linear amplifier 10-160m WARC 100W in 1.5kW out

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

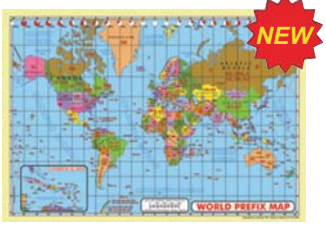
HL-2KFX £2695.95 C
HF +6m linear amp 1.8-29.7MHz + 50MHz 1kW PEP max, solid state

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

WATSON VALUE

NEW STOCK & OFFERS

W&S World Prefix Map



This attractive full colour map for amateurs and SWL's alike is split into regions, each highlighted in a different colour with the amateur prefixes in red. On the A2 map there are more details regarding islands.. Both sizes are laminated in flexible plastic.

A2 Size (WPMM-MAP) **£4.99 A**
A3 Size (WPMD-MAP) **£2.99 A**

YAESU FT-60E NEW

**Wide band Reception 108-520MHz & 700-999.990MHz (Cellular blocked)*
**New Emergency Automatic ID System*
**High 5W Power Output*
**Ni-MH Long-Life Battery FNB-83 (7.2V,1400mAh)*
**Programmable Keys for user convenience*
**Split CTCSS/DCS and DCS Encode-Only Capability.*
£179 B

NEW MFJ-935B /936B "Magic Circle" 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**

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-08	8cm diam magnetic	£9.95 A
WM-14B	14cm diam magnetic	£12.95 A
W-3HM	Hatch mount	£14.95 A
ECH	Cable kit	£10.95 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
08000 73 73 88
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

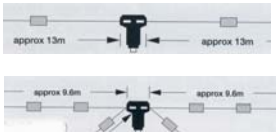
Perfect for QRP. SSB / CW and DSP processing. Passband down to 100Hz. Built-in SWR meter and electronic keyer. Max Tx drain 4A. Size 15 x 6.5 x 18cm. 680g.

£589.95 B

NEW 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.

NEW 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

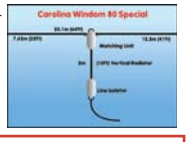
CW-160 £129.95 C
8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 265ft long.

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 £199.95 B
40m - 2m adjustable dipole. 250W and max length of 4.65m. Packs down to 65cm approx.

W3-MBP £199.95 B
Sames as W3-BP but packs even smaller.

W3-BS £134.95 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
Screwdriver style adjustable HF QRP whip 40m - 70cm. 150W PEP. Max extended 185cm approx

MP2-SA £199.95 B
Electrically tuned version of the above. Requires around 9V - switch control box not included.

MP-80M £29.95 A
Add on 80m coil to extend the LF coverage of the MP1 and MP2.

High Sierra Mobile Whips

HS-1800/PRO
£379.95 C
The ultimate mobile whip. Electrically tuneable 80m - 6m 1kW PEP Includes switch box and 12V cable. Massive 2" coil. Made in USA. Superb!!

SIDEKICK
£249.95 C
As used by Peter Waters G3OJV/M

Get mobile on all bands from 80m to 6m in minutes. This compact screwdriver antenna comes with cables and control box. Designed to go on our 3-way magnetic mount (£39.95 extra) it is an amazing performer and only 1.37m maximum!

Carriage Charges: A=£3, B=£6, C=£10

RadCom
RADIO COMMUNICATION

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RSGB MEMBERSHIP – Annual Rates

Home Corporate	£42.50
Overseas Corporate	£42.50
Corporate (Senior Citizens) (Applications should provide proof of age at last renewal date)	£33.50
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Special arrangements exist for blind and disabled persons. Details and membership application forms are available from RSGB HQ.

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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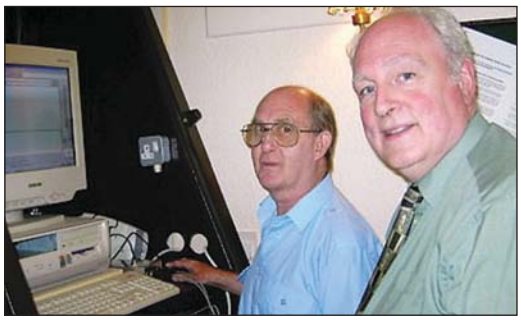

p18 – The RSGB's GB2RS news service celebrates its 20th anniversary

p26 – Peter Hart reviews a Cushcraft vertical antenna

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926.
Limited by guarantee
Member society of the
International Amateur Radio Union

Patron: HRH Prince Philip, Duke of Edinburgh, KG, KT

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

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HONORARY TREASURER:
Position vacant

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P Berkeley, M0CJX
I Rosevear, G3GKC
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P Brooks, G4NZQ
Details of the Society's volunteer officers can be found in the RSGB Yearbook 2005

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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.

RSGB matters

Board and National Council elections 2005

It is formally announced that the following vacancies will arise to the Board for the 2005 elections.

THE BOARD (TWO VACANCIES)

Gordon Adams, G3LEQ, and David Hicks, G6IFA, have each completed their terms of office. Gordon has now finished six years' service and in doing so must retire on 31 December 2005. David has completed one three-year term and may stand for a second term.

Members who wish to stand for election to the Board must have been a corporate member of the RSGB for at least two years and need to obtain nominations and supporting signatures from 10 or more corporate members of the Society in good standing.

NATIONAL COUNCIL (SIX VACANCIES)

Elections will be held in the following regions:
Region 1 – Scotland South and the Western Isles. The regional manager has completed a three-year term of office.
Region 5 – West Midlands. Position vacant.
Region 7 – South Wales. Position vacant.
Region 10 – South and South East Region. Position vacant.
Region 11 – South West and the Channel Islands. Regional manager has completed a three-year term of office.
Region 13 – East Midlands. Position vacant.

At the present time, there are co-opted regional managers serving in the following regions:
Region 7 – South Wales.
Region 10 – South and South East.
Region 13 – East Midlands.

These appointments cease on 31 December 2005. The regional council therefore has six vacancies. Candidates are welcome for all vacant positions, regardless of whether or not an incumbent is standing for election.

Members of the Society who wish to stand for the National Council must reside in the relevant region. They must have been a corporate member of the Society for at least two years and need to obtain the nominations and supporting signatures of at least five, but no more than ten, corporate members of the Society in good standing and residing in the region in which the candidate is standing.

Requests for election papers are to be forwarded to Sarah Clark, PA to the general manager. Telephone 01707 659015 or e-mail GMDept@rsgb.org.uk.

Letter from the editor

The more observant readers of this month's edition of RadCom will already have noticed an important change compared with the previous issue. The name at the top of the staff list on the content's page no longer reads Steve Telenius-Lowe but Alexander Kearns. For those of you not already aware, I am the new editor of RadCom. Steve did a sterling job as editor for several years and is now enjoying a well-deserved retirement in Malaysia. I plan to build on the good work that Steve put in.

Every editor has his or her own style of editing and I like to think that mine rests on three key tenets: excellent editorial content; great presentation; and reader participation. I shall look at each of these in turn, outlining for each my plans for the future.

In terms of the editorial content, I am in the fortunate position of being able to rely on a small army of enthusiastic columnists who love nothing more than to share their extensive expertise of amateur radio issues with you. These columns will remain the central pillars of RadCom's editorial under my stewardship. However, I also intend to introduce a number of new editorial features, including interviews with famous hams and articles that celebrate the social aspects of amateur radio. Amateur radio is a hugely exciting hobby and I want to convey some of that excitement in the magazine.

While the editorial content is a magazine's most important asset, it is not the only measure of a successful publication. The design – or presentation – of a magazine is also important and, with this in mind, the RSGB and I are in the process of drawing up a fresh new look for RadCom. This will take time so don't expect big changes over the next couple of issues. But by the start of next year, RadCom should be boasting a striking new design. We hope you will like it.

One of the things that attracted me to the RadCom editorship was the level of reader participation the magazine attracts. There is nothing more dispiriting for an editor than to toil for weeks over a magazine and then, once it's published, receive absolutely no feedback from readers. Given the number of reader letters I have already received, I don't think an empty post bag is something that I am going to suffer very often as RadCom editor! Long may that continue.

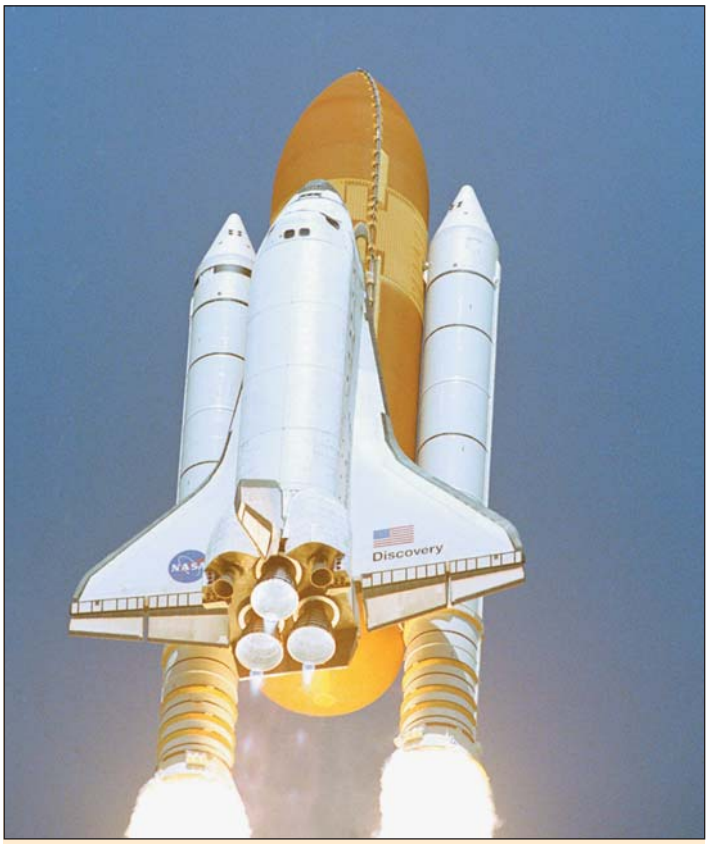
Writing to RadCom's Last Words is an easy and effective way that readers can share their views with the rest of the amateur radio committee but I also want to provide new forms of reader participation. The RSGB and I are investigating the possibility of offering all members of the society a free blog. For those unfamiliar with blogs, they are basically online personal magazines where you can publish details of your latest amateur radio projects, put up your own technical articles or simply report on what you have been up to. We are also planning to offer an easy-to-update website design for amateur radio clubs. There will also be changes to the RSGB website to make it easier to use and to offer new services. Watch this space.

Alexander Kearns
Editor, RadCom

Congratulations

John Bagley, M3JBY
Keith Allen, M3ICP
Peter Nettleton, M3NLT
Guy Burlington, M3JYX
Michael Robert Prior-Jones
Kevin Shipley, M3ISE
Colin Weaving, M3WCK
John Newham, M3HHU
Seriden Hawkins, M3RHS
Ralph Remnant, M3VOK
William Gissing, M3IVO
Felix Farquharson, M3KNO
Jonathan Elmer, M3LSQ
Robert Gloess, M3IAT
Brain Marston, M3IBG
Simon Beales, M3BUV
Geoffrey Elsworthy, M3HWY
David Wardman, M3HWN
Antony Sayers, M3TGS
David McKeon, M3ZDM
John Redfern, M3BMP

Are all members that passed the July Intermediate Examination.



We have lift-off

The space shuttle Discovery blasted off from Kennedy Space Centre on Tuesday 26 July, carrying six radio amateurs aboard, including flight commander Eileen Collins, KD5EDS. The shuttle was originally due to take off on 13 July but the mission was delayed after a fuel sensor circuit failed during countdown.

The launch marked US space agency NASA's return to manned space missions after a two and a half year break following the Columbia disaster in 2003. Columbia broke up on reentry, killing all aboard, as a result of damage to a wing caused during take-off.

GB2RS news service 50th anniversary celebrations

The Radio Society of Great Britain is planning a series of celebratory news broadcasts to mark the 50th anniversary of its GB2RS news service. The broadcasts will start on 25 September 2005 – exactly 50 years after the first GB2RS transmission was made by G6MB – and continue at regular intervals over the subsequent five weeks.

To mark this special occasion, the RSGB is hoping to include a greetings message from its patron – HRH, The Prince Philip, Duke of Edinburgh – within the broadcasts. The RSGB has also requested that communications regulator Ofcom allows the society to use a special event station callsign – GB50RS – during the celebratory period.

The plan is for GB2RS news readers to broadcast the special celebration greetings message using the callsign GB50RS and then continue to read the weekly news under the normal call of GB2RS.

In search of rising DX stars

Do you know any newcomers to HF DXing who have made great progress over the past year? If so, you are encouraged to nominate them for the prestigious G5RP Trophy, an annual award aimed at encouraging newcomers to HF DXing. Nominations should be sent to Colin Thomas, G3PSM, at the RSGB Spectrum Forum at RSGB HQ or emailed to spectrum.chairman@rsgb.org.uk. They should arrive no later than 27 August. The winner will be presented with the trophy at the RSGB International HF and IOTA Convention in October.

Get your licence at RSGB HF convention

The Radio Society of Great Britain is planning to offer attendees of its HF convention over the weekend of 7-9 October the opportunity to take their UK licence examination. The Society provided examination sessions at its HF convention last year and they proved such a success that it has decided to repeat them this year.

Candidates will be able to sit Foundation, Intermediate and Advanced radio communication examinations, with those who want sit one or more examinations subject to the usual qualification requirements.

Candidates need to preregister via RSGB HQ (contact Sylvia Manco, sylvia.manco@rsgb.org.uk) and, ideally, complete some of the practical assessments in advance of the event. Advice and assistance with the latter can by obtained from Brian Reay, G8OSN (ardc.chairman@rsgb.org.uk).

12-year-old wins Young Ham of the Year award

Rebekah Dorff, WG4Y, has won the Amateur Radio Newsline's Young Ham of the Year award. In reward for winning the prize, she received – courtesy of the award's sponsor Vertex Standard – an all-expenses-paid trip to the Huntsville Hamfest, along with a gift of Yaesu ham radio equipment.

Another sponsor, CQ Magazine, will treat Rebekah – who is just 12 years old – to a week at Spacecamp-Huntsville, and will present her with a variety of CQ products. She will also receive a commemorative plaque.

The Amateur Radio Newsline Young Ham of the Year award (formerly the Westlink Report Young Ham of the Year) has been running for the past 20 years, and is presented annually to a licenced radio ham of 18 years of age or younger who has provided outstanding service to the nation or community through amateur radio.

Rebekah, of Hoover, Alabama, entered ham radio in 2001 at the age of 8. She comes from an almost all-ham family. Her numerous ham radio-related accomplishments include setting up and running Birmingham (US) Amateur Radio Club's weekly BARC Kids Net.

Sound of Music screenwriter Ernest Lehman K6DXK dies

Some sad news to report. Hollywood producer, director and writer Ernest Lehman, K6DXK, has become a Silent Key. While best known for his screenwriting for musicals such as The Sound of Music, The King and I and Hello Dolly, K6DXK was also acclaimed in the world of screen drama. In that genre, he was responsible for scripting Oscar nominated films including North by Northwest, Who's Afraid of Virginia Woolf and Portnoy's Complaint. The latter he also produced and directed, in 1971.

In 1979, his novel The French Atlantic Affair was brought to the small screen by writer-director Douglas Heyes. The French Atlantic Affair mini-series starred Jose Ferrer, Jean-Pierre Aunont and Carolyn Jones. It also featured ham radio in a leading role as the secret communications tool used to save a hijacked ocean liner and its passengers.
In 2001, the Academy of Motion Picture Arts and Science honored K6DXK with its lifetime achievement award. The honorary Oscar was presented by actress Julie Andrews who played the lead role of Maria von Trapp in The Sound of Music.
Source: ARNewsline

Farewell Steve


Photo: M5ACN

On 11 July, the Society bade farewell to the editor of RadCom, Steve Telenius-Lowe, G4JVG. Here, he is with the RSGB general manager Peter Kirby, G0TWW (right). Steve is now in Sabah, North Borneo, with his wife, Eva, 2E1FHJ, starting a new life there. Look out for him as 9M6/G4JVG when they have settled-in.

What is the true purpose of GB4FUN?

GB4FUN project manager Carlos Eavis, G0AKI, corrects a popular misconception amongst radio amateurs about the true role of GB4FUN

GB4FUN has now been on the road for three years and its successes well documented in the pages of *RadCom* and with constant letters of praise from the educational establishments visited. Yet the one question I am often asked is "*why* is it such a success?" Especially as it generally appears that the youth of today, surrounded by the Internet and mobile phones, view radio as being no more than local FM broadcast stations and a redundant technology.

When the GB4FUN project started we had to find a way of getting into schools; no easy task. If you look at the number of other hobbies that are promoting themselves in every magazine rack across the country you soon realise that if schools allowed time for every interest, there would not be time left for teaching the National Curriculum.

The way forward was to provide the schools with something they wanted – not just what we wanted to show them. At primary school level the curriculum covers waves and radiation. Secondary schools get into the electromagnetic spectrum (radio waves through to Gamma rays) but generally only in theory, with little or no practical demonstrations and a limited discussion on applications. 'A' level physics students have a requirement to understand Doppler shift, low earth orbit satellites, geostationary satellite battery life etc.

Even so, most students fail to understand the science behind the core technology. Part of the reason is that they are already surrounded by this transparent technology in the form of Bluetooth, WiFi, mobile phones, and of course television. But if you stop to ask them how any of this equipment works you are normally met with blank expressions and the odd hushed whisper of "magic?" 'Magic' is not that bad a description for something that propagates at 186,000 miles a second or seven times around the earth in one second, but alas it hardly begins to cover the complexity of the subject.

GB4FUN's ability to prove through radio that the perceived redundant science is a vibrant 21st century technology without which the Internet and the students' much-loved mobile phone would not function – and space exploration would be impossible – is a very valuable educational tool. Judging by the demand for the resource, this message is not lost on the teaching community.

So what *is* GB4FUN's principle role? "To make more radio amateurs" is the normal response heard on the bands! But that is only a small part of its task, its main aims are to change forever the perception amongst students of what radio is, to show practically how in its various forms RF is used every day in the modern world, to raise the profile of RF sciences, and to promote the fascinating world of radio.

MEMORIAL SERVICE

A memorial service was held on Friday 1 July to celebrate the life of Gerald Hill David, OBE, FREng, FIEE. Gerald David was the first chairman of the Radio Communications Foundation. The Foundation and the RSGB were represented by Dr Bob Whelan, G3PJT, Trustee of the RCF and a past president of the society.

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.

Mr A B Pidgeon, G6CBP
Mr N A Golding, G6RIG
Mr G Sandsbraaten, LA4EC
Mr D B Sampson, M1DOZ
Mr D F Easton, GM7AWK
Mr J L Reade, G4OHQ
Mr M J Dunn, RS44977
Mr B Mellor, G7UOT
Mr REG Kendall, G8BNE
Mr FJS Ward, G0DGG
Mr G S York, G8MXD
Mr R A Maskell, VE3ADM
Mr G Cooper, G3HJP
Mr T T Harber, G4SZS
Mr P Lalibert, F3ET
Mr G E Snaith, G6KVX
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Mr J J Horsburgh, GM1RDG
Mr S Riddell, GM3YCB
Mr R R Humphries, M3RRH
Mr F L Cooper, MI0BWK
Mr R Roberts, G3MAK
Mr D H Duffill, G4UBY
Mr C G Wackett, G0GVN
Mr M M Chapman, M1ABM
Mr R Godfrey, N3DQW
Mr MW Coles, M0CIE
Mr A J Matthews, G3UNM
Mr D J T Burrell, G8LUB
Mr K C Li, G0TOY
Mr G V Higton, G8KGK
Mr J C Stephenson, G1ZFG
Mr P Malon, G4BLF
Mr J S Mason, G8YFK
Mr P G Harris, G4ZOB
Mr R Ball, G4UXB
Mr EH Matthews, G3NPL
Mr D King, RS190590
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Mr N S Lowson, GM4XRF
Mr J F Jones, GW1UVN
Mr G Dale, G3MFH
Mr T Bromley, G1WPR
Mr M Morse, M3MMZ
Mr R J Ashman, M3RJA
Mr L Foster, RS20323
Mr K J Dennis, G7PHT
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Mr K J Rawlings, M0KIM
Mr RM Hunt. M0RHI
Mr A C Keeble, G4HPU
Mr L V Fatta, KB9OOM
Mr I Reynolds, M1ISR
Mr W E McCallum, GM0POD

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.

NEW

RSGB Yearbook 2006

Edited by Steve White, G3ZVW

The RSGB Yearbook is the essential publication for all UK radio amateurs. Not only does it contain the only truly up-to-date database of callsigns, names and addresses in the Callsign Directory, it also contains over 192 pages of information about the Society, clubs, licensing and operating. This year's edition is bigger than ever with over 500 pages of useful information.

NEW THIS YEAR

The Yearbook contains interesting features on Summits on the Air and International Museums Weekend. This year sees a huge new section added to the Yearbook "Featured Clubs". We asked all the radio clubs around Britain to send us information to publish in the Yearbook and we were truly overwhelmed at the response. From Scotland to Cornwall, you'll be able to find out about where those clubs meet, something of their history, what they do for their members, how they encourage newcomers etc. You'll see their emblems/logos, and photos of some of their members or the activities they are involved in. The "Featured Clubs" pages contain 55 mini features devoted to a local clubs across the country.

FREE DVD

For the first time included in the 2006 Yearbook is a free DVD. It contains the movie 'RSGB Today', which was professionally produced for the Society earlier this year. In 'RSGB Today' you will meet the people behind RadCom, and the other departments at RSGB HQ. You'll see an M3 licence course in Cheshire and the Annual General Meeting. But there's more than just the movie on the DVD. We were unable everyone's input onto the clubs section mentioned above on the thirteen pages available in the book. So we have included all the information supplied to us on the DVD that we received from clubs that responded. There is even more on the DVD with a wide selection of amateur radio software.

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The RSGB Amateur Radio Operating Manual is a valuable addition to your bookshelf and the must have book for everyone interested in amateur radio.
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This book includes all the words, pictures and line drawings from the most popular column in RadCom.
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The official source of DXCC information! Record the DXCC Entities you've worked and QSLed! This new edition includes a complete listing of DX Century Club rules including the latest changes and clarifications.
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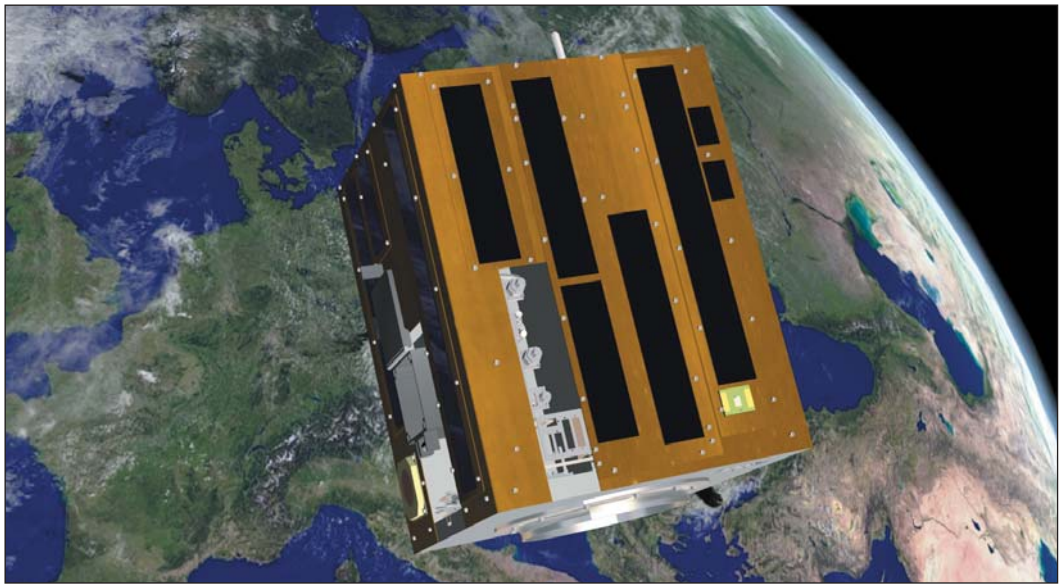
All prices plus p&p

E&OE

Radio amateurs play vital role in student space project



The launch of SSETI Express, the first spacecraft designed and built by European students, including radio amateurs, has been delayed by a month. The craft was due to take off on 25 August from Plesetsk in Russia but is now set to launch in late September. Funded by the European Space Agency, the space ship will take up an Earth Sun synchronous orbit 686km above the Earth.

Built in just 18 months by 15 teams of students from ten universities in nine countries, the 62kg craft – similar in size to a washing machine – will deploy three tiny 1kg pico-satellites in a first such operation in space history. The Express will also function as a fully operational satellite, taking pictures of the earth and providing a radio transponder for the global amateur radio community.

"The spacecraft is a credit to each and every one of the dozens of students and radio amateurs involved in its design, development, integration and testing. We are all very excited about the upcoming flight," said SSETI Express project leader Neil Melville.

"The primary objective of SSETI Express has already been met many times over; the educational value of this experience is vast and I'm sure the benefits will be felt not only by the many students working on this project but also in future SSETI, and related, projects throughout Europe," added Melville.

Take-off of the craft will mark the end of a long and difficult journey for the students. They had to work many evenings and weekends to ensure that the project remained on course. Numerous tests also had to be undertaken before the craft could be deemed space worthy.

These included three-axis sinusoidal, quasi-static and random vibration tests; thermal vacuum tests including bake-out and four thermal cycles: electromagnetic compatibility tests: and extensive testing of all the spacecraft's functions.

By 27June, it was declared ready for flight. As student Karl Kaas Laursen says, "we will be waiting to see if we have built something that can survive anything – the launch and the harsh space environment. SSETI Express will do it, just watch…"

Laursen is one of three students and one radio amateur (Graham Shirville of the UK) who will be monitoring the launch from Plesetsk. The rest of the SSETI Express team will watch a live transmission of the launch at specially organised events in their home countries.

The European Space Agency is planning follow-up student space projects to the SSETI Express, including the European Student Earth Orbiter (due to be launched in 2008) and the European Student Moon Orbiter (2010-2012).

FCC proposes to scrap Morse test in US licence examinations

The US is set to follow the lead set by the UK and abolish the need for radio enthusiasts to pass a Morse code test in order to obtain a licence. The Radiocommunication's Agency (now Ofcom) dropped the Morse code element of licence examinations in 2003 and now the Federal Communications Commission (FCC) – the agency responsible for regulating amateur radio in the US – is proposing to do the same.

The commission said it believes dropping the five words per minute Morse examination would encourage more people to become amateur radio operators and would eliminate a requirement that's "now unnecessary" and may discourage current licensees from advancing their skills. It also said the change would "promote more efficient use" of the amateur spectrum.

The FCC's decision to review the examination rules on Morse code follows petitioning from 18 organisations including the American Radio Relay League (ARRL). It also comes after a change to Article 25 of the International Radio Regulations that allowed individual countries to decide whether a Morse test should be mandatory for amateur radio enthusiasts.

An FCC spokesman said: "Based on the petitions and comments, we propose to amend our amateur service rules to eliminate the requirement that individuals pass a telegraphy examination in order to qualify for any amateur radio operator licence.

"We believe that this proposal, if adopted, would encourage individuals who are interested in communications technology, or who are able to contribute to the advancement of the radio art, to become amateur radio operators."

Any change to the rules in the US is unlikely to take place for several months.

Annual Dutch balloon foxhunt

The annual Dutch balloon foxhunt is planned for 11 September. Last year the balloon foxhunt experienced several difficulties. Due to strong winds from different directions, the balloon hit the ground during the launch, causing a tiny hole in the balloon and a broken ATV antenna. There were no pictures from the balloon and the balloon only reached an altitude of 9km and not the 20km expected. However, because of the strong wind, the balloon landed close to the German border.

This year the launch is planned for 1100UTC. The event can be followed on the website www.ballonvossenjacht.nl. Let's hope everything goes as planned this year.

Sri Lankan radio society wins Golden Antenna award

The Radio Society of Sri Lanka (RSSL) and its president Victor Goonetilleke, 4S7VK, have won the Golden Antenna 2005 award for the outstanding work they did during the Tsunami disaster. The prestigious annual award is organised by the German town of Bad Bentheim and is given to a person or organisation that has used amateur radio in connection with humanitarian work.

The RSSL was selected for the prize by a jury including the president of IARU Region 1 and the president and chair of the Dutch and German amateur radio societies. Radio amateurs played a vital role in coordinating the relief effort in regions hit by the Tsunami because most other communications infrastructure was destroyed in the disaster.

Ofcom allocates Wey Valley radio legend's famous callsign

The Wey Valley Amateur Radio Group has been allocated the callsign of one of the area's most famous hams by radio communications regulator Ofcom. The group now operates the G6XN callsign used by the late Les Moxon, a revered antenna experimenter and regular columnist with RadCom.

Considered by many to be a radio guru, Les lived for many years in a hilltop QTH where he penned many a fascinating article and wrote the much-admired technical book HF Antennas for All Locations.

The allocation of Les's callsign to the Wey Valley club was supported by Les's wife Nancy and son David. "The transfer of my late father's callsign to the Wey Valley Amateur Radio Group is a move I personally support, ensuring as it does an ongoing and lasting reminder of my father's contribution to amateur radio over so many years," said David Moxon.

A spokesman for the Wey Valley club said: "It will be a privilege to sustain his memory and recall his many achievements in the field of radio."

Mobile phone threat to radio astronomy

Plans to lift restrictions on mobile phone use in planes could cause major disruption to radio astronomy, scientists have warned. Two US agencies – the Federal Aviation Administration (FAA) and the Federal Communications Commission (FCC) – are considering scrapping a ban on using cell phones on planes following pressure from travellers. But astronomers – including representatives from the US's National Academy of Sciences – are worried that transmissions from mobile phones could drown out radio signals from outer space, jeopardising vital research into the universe.

The problem is that cell phones generate radiation not only at their main operating frequency but also at multiples of this frequency. The frequency of one of these harmonics, it transpires, falls into the same band that contains information about the molecular make-up of newborn and dying stars. It is also in the small part of the electromagnetic spectrum reserved for use by radio astronomers.

Another problem is that mobile phones adjust the strength of their signal depending on their proximity to a transmitter. The further away the transmitter, the stronger the signals. So mobile phones in planes tend to generate more radiation than those used on the ground. Worse still, the radio emissions from mobile phones on planes are not blocked by trees or buildings because they come straight from above.

Because the radio signals detected by radio telescopes are incredibly weak, having travelled many light years across the universe, they could easily be swamped by radio interference from mobile phones. Even a single phone conversation on a plane could disrupt radio telescope observations. According to one astronomer, lifting restrictions on cell phone use in planes would be tantamount to building a 40,000ft high mobile phone tower.

The National Academy of Sciences is now lobbying the FAA and FCC to maintain existing restrictions on mobile phone use in aircraft, while the National Research Council's committee on radio frequencies is calling for measures to minimise interference caused by airborne mobile phone transmissions.

One such measure would be to install a picocell in planes. This would function as a local transmitter, telling mobile phones to keep their power output down and then transmitting the phone signals to earth on a single frequency that would not interfere with radio astronomy.

IMAGE COURTESY NRAU/AUI

Final call for nominations for 2005 Raynet shield

Nominations are still open for the prestigious 2005 Radio Amateurs' Emergency Network (RAEN) Trophy. The shield is awarded to an individual or a group that has "provided services beyond the call of duty" in furthering the aims of Raynet. But there is not much time left to get your nomination in. The closing date is September 1.

All members of Raynet are eligible for the annual award but it is essential that nominations are endorsed by a group, county or area controller or a zonal coordinator. Nominations should include supporting evidence and be sent to Raynet company secretary Ian Jackson, G8RWH, at Hunters Moon, Station Road, Newton-le-Willows, Bedale, DL8 1SX. The envelope should be marked "Shield Nomination".

A copy of the nomination rules is available on the Raynet website by clicking on the "Raynet Trophy" link. The trophy will be presented to the winner at the RAEN's national annual general meeting.

Raynet members provide vital communication services in the event of major emergencies. They were active in London on 7 July when the mobile phone network went off air following the terrorist attacks.

Club and regional news

1 Scotland South & Western Isles

COCKENZIE & PORT SETON ARC
30, 2nd 144MHz DF Hunt Meet.
Bob, GM4UYZ, 01875 811 723
LOTHIANS RS
12, Club Presidents Address.
26, Talk, Social Evening.
Toby, MM0TSS, 07739 742 367
PAISLEY (YMCA) ARC
7, Autumn Reunion.
21, Magnetic loop aerial project.
Jim, GM3UWX

2 Scotland North & Northern Isles

ABERDEEN ARS
1, Junk sale/field day preparation.
8, Talk by Tony Langton, GM4HTU
29, Construction group/morse and on the air. Ellis, GM4JLZ, 01224 580 594
DUNDEE ARC
27, AGM - At Graham Street College.
Donald Black, GM0PIV, 01382 455771
MORAY FIRTH ARS
30, Construction Evening
Geoff, MM5AHO, 07770 726 759

3 North West

CHESTER & DARS
6, The secrets of the Samurai
20, Talk by Phil, G3SES
27, Surplus Sale
Derrick, M1SUM, 0151 356 1572
STOCKPORT RS
6, Skills Group/Practical evening
20, "The aerials we use", a presentation and discussion with Bernard Naylor G3SHF. David, M1ANT, 0161 456 7832
THORNTON CLEVELEYS ARS
5, Club on air
12, Home Security
19, Construction
16, Technical Talk
Jack, G4BFH,
jack.duddington@btinternet.com
WARRINGTON ARC
6, "The DX Cluster" a talk by Mike, M0ACK
13, Book Sale
John, G0RPG, 01925 762 722

4 North East

HALIFAX & DARS
20, AGM
Tom, M0TKA, 01484 715 079
HORNSEA ARC
3, SSB Field and BBQ at Bewholme
5, Antenna Workshop meet at Bewholme
11, Antenna Workshop meet at Bewholme
21, Activity Night
28, Talk by G8MGE
Richard, G4YTV, 01964 562 498,
g4ytv@aol.com
KEIGHLEY ARS
8, Quiz night & supper
29, Bill Scarlett, G3RXS - Talk on Raynet
Kath, G0OSA, 01535 656 155
SHEFFIELD ARC
3, SSB Field Day
12, Operating Evening
19, Talk - Peter Day, G3PHO, 'Laser Communications'
26, RSGB Bookstall
Nick, G4FAL, 0114 255 2893

5 West Midlands

CHELTENHAM AMATEUR RADIO ASSOCIATION
2, Raynet Today - Cathy Clark, G1GQJ
Pat, G3IKR, 01386 792 542
COVENTRY ARS
2, 2m DF
9, Night on the air, Novice class, cw practice
23, Night on the air, Novice class, cw practice
John, G8SEQ, 024 7627 3190
GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY
5, AGM
12, Workshop/on air
19, Workshop/on air
26, Workshop/on air
Tony, 01452 618 930,
MALVERN HILLS RAC
13, "The z match tuner" - Mike Allenson, G3TGD
Mike, G3TGD, 01905 830 752
MID-WARWICKSHIRE ARS
13, Foxhunt reports and review/natter night
27, Homebrew
Bernard, M1AUK, 01926 420 913
SALOP ARS
Fred, G3NSY, 01743 790 457
29, Talk by Raynet
SOLIHULL ARS
15, Talk on "Wireless in the Midlands" by Bill Moorwood, G3CAQ, At the Shirley Centre
Paul, G8AYY, 0121 783 2996
TELFORD & DARS
3, 1600 hours, set up Telford Rally @ show ground - Shrewsbury
4, Telford Rally, show ground - Shrewsbury
14, Visit to Sleap Airfield
21, Quiz with G0EYX
28, Talk on Enigma/War radios
Mike, G3JKX, 01952 299 677,
mjstreetg3jkx@aol.com

6 North Wales

DRAGON ARC
5, "Rambles Underneath Wiltshire" by Les, MW0SEC
19, RSGB video, Jim G0EJQ
Leslie, 01248 470 606
WREXHAM & DARS
6, Foxhunt
Mark, MW1MDH,
markmdh@btopenworld.com

7 South Wales

ABERYSTWYTH & DARC
3, Across-Wales Walk, with Dave, GW8SFT
4, At Telford Rally
Ray, mwmg01@aber.ac.uk

8 Northern Ireland

No club news details provided.

9 London & Thames Valley

COULSDON AMATEUR TRANSMITTING SOCIETY
12, CATS 30th Birthday Dinner
Steve, G7SYO, 01737 354 271
CRAY VALLEY RS
3, M8C active in 144MHz Trophy contest - M3RCV
15, The computer in YOUR shack - G0FDZ
24, British Wireless for the Blind - G0VJG
Richard, G7GLW, 07831 715 797,
rcains@btinternet.com
CRYSTAL PALACE RADIO & ELECTRONICS CLUB
2, My Electronics Career by G3DJK
Nick, 020 8689 2145
HODDESDON RC
13, Antivirus for beginners and general computer Q&A
27, Members pictures and videos
Don, G3JNJ, 020 8292 3678
READING & DARC
8, Magnetic fields and their effects (part 2 with demo) by Ivan Eamus, G3KLT
22, Thames Valley Air Ambulance, technically biased.
Pete, G8FRC, 01189 695 697
SHEFFORD & DARS
8, Return after Summer recess
15, Kenwood Electronics visit by David,G5HY
22, Mobile DF Hunt
29, AWDRE Knew First by David, G8UOD
David, G8UOD, 01234 742 757
SILVERTHORN RC
2, Club camp debrief
9, Informal evening
17, Junk sale
23, Informal evening
30, On the air night
Les, G0CIB, 07980 275 081
SOUTHGATE ARC
8, Astronomy talk and possible demo
Mike, M0ASA, 020 8366 0698
STEVENAGE & DARS
6, VHF Operating
13, Building a 'Fred Box' 10mW 2m AM handie! Tom, G4BYE
20, Portable Operating by Chris, G0WTZ of ML&S
27, Q Multipliers - How big is your Q?
Neil M0ARH, 01438 217 077
SURREY RADIO CONTACT CLUB
5, PIC's (Programmable Integrated Controllers) with Gareth, G4XAT
Ray, G4FFY, 020 8644 7589
SUTTON & CHEAM RS
15, Talk 'EMC' - By Nick Hooper, G8NLY
John, G0BWV, 020 8644 9945,
info@scrs.org.uk

10 South & South East

ANDOVER RAC
4, Autumn Boot Sale
6, Quiz Night with Itchin Valley Radio Club
20, The Crystal Set Challenge
Nicky, 2E1NAC, 01722 718 457
BASINGSTOKE ARC
3, SSB Field day
4, SSB Field day
5, Club Meeting
24, New Forest Foxhunt
25, New Forest Foxhunt
Frank, M0AEU, barc@2lo.info
FAREHAM & DARS
7, Natter night and Club Station Operating with G3VEF/G8KGI
14, Talk by Richard, G3AAT
21, Digital and Data Modes by Bob, G8VOI
28, Talk by Chris, G8JFJ
enquiries@fareham-darc.co.uk
HARWELL ARS
13, Antique Radio, Malcolm, G4MKF
Angus, G0UGO, 01235 522 858
HASTINGS ELECTRONICS & RC
21, Construction contest
Gordon, 01424 431 909,
gordon@gsweet.fsnet.co.uk
HORNDEAN & DARC
6, Social Evening
27, 1-Sep-2005
Talk by Owen Neil on 'Heath Robinson'
Stuart, G0FYX, 023 9247 2846
HORSHAM ARC
1, Contest Briefing + CARC v HARC pub quiz. David, G4JHI, 01403 252 202
ITCHEN VALLEY RC
9, Fox hunt - Brian, G0UKB
23, Show and Tell: Your rigs/antennas
Sheila, G0VNI, 023 8081 3827,
sheila.williams@ivarc.org.uk
MID-SUSSEX ARS
2, Fox Hunt Alan and Stella
9, Radio Night
16, Radio Night
23, Skittles Night
30, Radio Night
John, G6XTW, 01273 588 556
SOUTHDOWN ARS
5, Marconi and Spain video talk
9, RCN visit to SARS, John G3DQY
John, G3DQY, 01424 424 319,
vaughdqy@aol.com
TROWBRIDGE & DARC
7, Members Short Talks 2 - "Basic Structural Design for Antenna Installations" - Jan, G0BBL; "Bees and Mead" - Erle, G3BJC; Bradford Wireless Club by Hazel, G7RGI
Ian, G0GRI, 01225 864 698
WORTHING & DARC
7, Tiger in the sky
14, Power Station Visit
21, Construction Contest
28, History of Newhaven Fort
Roy, G4GPX, 01903 753 893

11 South West & Channel Islands

APPLEDORE & DARC
19, Radio Quiz Night
Brian, M0BRB, brian.jewell@ic24.net
BOURNEMOUTH RS
2, John, M1BAI showing amateur radio videos
16, John, M1BAI, "Mechanical TV"
David, G4BKE, 01202 697 338, www.brswebsite.freeserve.co.uk
CORNISH RADIO AMATEUR CLUB
1, Main Meeting
12, Computer section. 25 years of the computer section by Peter John, G4LJY, 01872 863 849
EXMOUTH ARC
7, Club Open Evening
14, Auction Bring and Buy
Mike, G1GZG, 01395 274 172
HOLSWORTHY ARC
7, Bring and Buy + Auction
David, 01288 353 561, m3eoq@hotmail.com
PLYMOUTH RC
3, Rooster Breakfast Trago Mills Liskeard
13, Memories of an air wireless mechanic 1949-1951. A talk by Laurie M0VRT
Frank, G7LUL, frank@foxonezero.fsnet.co.uk
SOUTH BRISTOL ARC
7, Computer and Software Clinic
14, Photographs from members' archives
21, Old domestic radios - working!
28, On the air evening.
Len, G4RZY, 01275 834 282
SOUTH DORSET RS
13, Journeaux Historic Wireless Talk by H. Journeaux
Carol, 2E1RBH, 01305 820 400, carolonfraggle@tiscali.co.uk
THORNBURY & SOUTH GLOUCESTERSHIRE ARC
7, Test gear
14, On air night
21, Valves with Mike
28, Video night
Stan, G0RYM, stang@talkgas.net

12 East & East Anglia

CAMBRIDGE & DARC
2, Getting started on satellites.
Carlos, G0AKI
9, Echolink refresher Daryl, G0ANV
16, Upgrading the club's 2m linear Dave, G6KWA
30, Calibrating homebrew rig, Mark's network analyser
Ian, G4AKD, 01954 782 974
CHELMSFORD ARS
6, Antennas-Live, Murray, G6YJB
Martyn, G1EFL, 01245 469 008
DOVER RC
7, Operating and natter night
14, A talk about GB3KS the local repeater
21, Operating and natter night
28, Talk "A step beyond the foundation level morse assessment"
Brian, G4SAU, g4sau@bcuff.freeserve.co.uk
HAVERING & DRC
7, Michelle Tuck talks on her Trek following the Inca Trail in Peru
14, Informal Night
21, Richard Clarkson from the Vulcan Restoration Trust
28, Informal Night
Dave Cutts, 2E0EBV, 07956 594 514
LEISTON ARC
6, Simple and Effective HF Aerials - Alan Melia, G3NYK
Paul, M3MIG, 01728 746 044, m3mig@aol.com
NORFOLK ARC
3, Field day and police gala day
7, Bring your gadgets and gizmos - David, G7URP
14, Summer dinner - David, G7URP
21, Radio workshop
28, Bring your QSL cards - Mark, G0LGJ, Reg, G0VDO, 01603 429 269
SOUTH ESSEX ARS
1, Working the international space station
Dave, G4UVJ
Dave, southessex.ars@btinternet.com

13 East Midlands

DERBY & DARS
6, Junk Sale
Martin, G3SZJ, 01332 556 875
EAGLE RADIO GROUP
13, Robot Wars Revisited. Local Robot Builder Shane Swan brings us up to date with the latest project
Terry, G0SWS, 07979 733 640
HUCKNALL ROLLS-ROYCE ARC
2, Visit to Nottinghamshire Police HQ
9, Talk on Rocketeering by G6BMZ
16, Members discussion on how that started Ham Radio
23, Forum
30, Talk on contest working by Martin, G6ABU
Keith, G6NHY, 07929 916 642, hrrarc@ntlworld.com
LEICESTER RADIO SOCIETY & COMPUTER CLUB
5, Video, on air
12, Lecture - code breaking by John Alexander
17, Club outing to Henlow/Chicksands
19, Video, on air
26, Construction, video, on air
29, Setup day Donington Park Show
30, Help at Donington Park Show
Tom, G1IUT, 0116 286 3949, tomchristmas@ukonline.co.uk

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

BATTLE OF TRAFALGAR BICENTENARY CELEBRATIONS

Cray Valley Radio Society - in conjunction with the Royal Naval Amateur Radio Society – is providing a "People's Trafalgar celebration" to mark the bicentenary of the Battle of Trafalgar during the week 21-23 October. The multi-station operation will run from the National Maritime Museum at Greenwich in South East London. A special callsign has been applied for. As well as the high profile operation, it is hoped to establish a display of maritime communications equipment through the ages.

The event will be open to the public from 10am to 5pm daily, with the museum expecting over 13,000 visitors during the time of the operation. As with previous operations organised by the society, there will be an award scheme. Special QSLs will be available and will be handled by Owen, G4DFI. Further details are available from either Dave Lawley, G4BUO, at g4buo@compuserve.com or Bob Treacher, M3RCV, at brs32525@compuserve.com

NEWBURY & DISTRICT ARS COURSES

The Newbury & District ARS runs Foundation courses on Saturday and Sunday and Intermediate courses over three weekends. The club is also an Advanced exam centre. For further information please contact Steven Elliott, M0SEL, preferably by e-mail steve.elliott@bg-group.com.

NORTH WAKEFIELD CLUB GUIDES GIRLS THROUGH COMMUNICATOR BADGE

The North Wakefield Radio Club recently played host to the 1st Rothwell Guides, who visited the club as part of their 'Communicator' badge. The girls enjoyed sending greeting messages that they had prepared in advance to Jackie, M3JTO, who was herself once a Guide, as well as being lead in a Morse code activity with Brian, G4OOC, and listening to HF contacts being made by John, G4RCG. The 18 girls and their two leaders were very happy with their night out, and said that they would tell other Guide and Scout groups about the club's offer to do more outreach work.

PUTTING A SMILE ON FRIENDLY FACES

Kelvan, 2E0BHF, and Geoff, 2E0EKB, of the Worthing & District Amateur Radio Club (WADARC) visited members of Worthing and Southlands Hospital Trusts "Friendly Faces" support group to deliver a talk on amateur radio.

The Friendly Faces group is made up of people who have suffered personal trauma, and the presentation was aimed at informing them of the vital role that amateur radio plays following major disasters and the long-term friendships the hobby fosters.

The talk was followed by a PowerPoint presentation and a short introduction to the hobby via a video made by the RSGB. The event was a major success from all accounts. As a WADARC spokesman said, "one very brave young lady took her Morse code test and proudly left clutching her certificate of achievement".

QUIZ EVENING

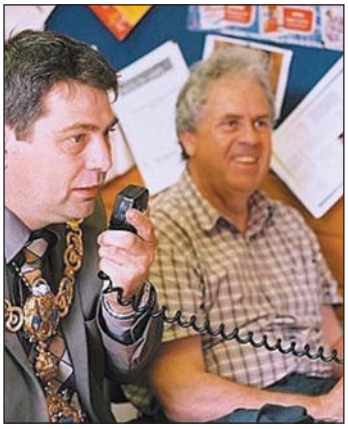
The Hornsea ARC hosted a quiz night with Scarborough ARS on 1 June. This revived an event that had not been held for several years, with the winners being awarded the Harry Jones Memorial Trophy. Scarborough won by a narrow margin and hopes to invite Hornsea for a return match next year. The questions were general knowledge with a couple of specialist radio rounds.

The late Harry Jones, G3GBH, lived in Bridlington up to his death in 1979 and was a great friend of both radio clubs as well as being a very knowledgeable radio amateur. His family kindly donated the trophy in his memory.

Duncan Heathershaw (left), chairman of Hornsea ARC, presenting the G3GBH Memorial Trophy to Ger Aske, chairman of Scarborough Radio Society.

SPECIAL EVENT STATION FOR RETURNING ATHLETES

Keighley Amateur Radio Society held a special event station – G0KRS – on 16 July to welcome back the athletes from the Special Olympic in Glasgow. The event was held at the Woodville Centre, Keighley, West Yorkshire, a training facility for young adults with learning difficulties. Local mayor Tony Wright attended the event.



Tony Wright (microphone) beside Keighley member Rod Metcalfe, 2E1PIW.

CANVEY ISLAND SHOW

South Essex ARS put on special event station GB2CPS from Castle Point Show on Canvey Island on 26 June. This was the first time the club had operated from this event. Club members received many enquiries from the general public about amateur radio and now are looking forward to operating from the same event next year.

TORBAY ARS ENTERTAINS GUIDES AND SCOUTS

Torbay Amateur Radio Society (TARS) once again participated in the annual Hurdlestone Challenge on 25-26 June but this time the society not only operated its usual special event station but also joined in with the challenge. The Hurdlestone Challenge is a sports and educational event for Guides and Scouts encompassing everything from archery to learning the theory of magnetism. More than 400 guides and scouts attended this year's event. Mike, G1FON, Derrick, G3LHJ, Colin, G4FCN, and John, G4VUD, of TARS provided the youngsters with an introduction to amateur radio.

Mike reports: "At times things were hard going, as the bands were quite flat and producing very sharp QSB. However, it did give us the opportunity to use these examples to explain amateur radio in more detail. All youngsters were suitably impressed by the distance and clarity of the QSOs, and many were doing sums in their head to work out if mum and dad could be persuaded to part with some more money so they could study for the Foundation Licence."

G1FON assisting a Scout with his first QSO.

RSGB VHF NATIONAL FIELD DAY

The Dundee Amateur Radio Club gathered at Douglaswood Scout camp on the outskirts of Dundee on Saturday for the annual RSGB VHF National Field Day. Club members erected a three beam antenna on masts and set up the radio equipment. They managed 32 contacts over two days.

TORBAY ARS TREATED TO FIBRE OPTIC SPEECH

Mike, G1FON, delivered a talk about optic fibres at a recent meeting of the Torbay Amateur Radio Society. In his speech, he pointed out that although fibre optics is widely considered to be a modern technology, the idea of transmitting light through a tube was actually proposed in 1880 just after the telephone was invented.

The problem was that the necessary laser light sources were not available at that time but in the 1950s research and development enabled remote illumination to be used in the medical world for viewing instruments whilst operations were taking place.

The big breakthrough, as Mike pointed out, started in 1966 when two engineers working for Standard Communications came up with a working concept for telephone call use. The progress was very fast and within a year telephone trunk lines were being changed from copper wire to optic fibre, massively increasing their operating capacity. The first trans-Atlantic fibre cable was laid in 1988 and could carry almost 38,000 calls simultaneously.

Among some of the interesting facts to emerge from Mike's presentation was that fibre optic lasers can be up to 1,000 times more powerful than the sun and that optic fibres can be as thin as the diameter of human hair. "This is one of many examples of how investment in modern technology has led to very cheap telephone calls across the world," concluded Mike to a captivated audience.

BUILD A 'BUDDIPOLE' FOR £20

Mike Taylor, M1MOG, hosted a popular construction evening on building a 'Buddipole' at the Havering and District Amateur Radio Club. The 'Buddipole' was based on an original idea from W3FF with a few modifications to the tuning coils.

The 'Buddipole' built by club members tunes to cover HF bands 40m, 30m, 17m, 15m, 12m and 10m and also VHF bands 6m, 4m, 2m and 70cm by adjustment of coil taps and the telescopic sections. The W3FF version is priced at around £199 (www.buddipole.com/buddipole.html) but thanks to Mike, Havering's version cost just £20 to build.

Mike said: "The event went very well, as we wound the loading coils and completed all the construction over two meetings. We did have a few 'Tomorrow's World' moments of course, but that only helped to make the evening most enjoyable."

NEW NEW NEW NEW NEW

Deluxe Logbook & Diary 2006

Now in glossy metallic green!

Designed for those requiring more from their Logbook, the RSGB have produced the popular Deluxe Logbook & Diary 2006. Containing far more than a standard Log book this edition has been thoroughly revised and updated. Amongst its many features are Band plans, locator maps, lists of abbreviations & codes and a DXCC prefix guide. As usual a 2006 diary section is included along with notes of events and contests through the year. This wire bound book contains generous 255 x 420 log pages yet folds neatly for storage (overall folded size is 255 x 210mm). This book is also the ideal way to neatly record a whole year of activity and store it in attractive way for years to come. This handy reference guide is in the ideal place for every day use - the logbook of the shack!

The Deluxe Log Book & Diary 2006 includes:

- 2006 diary
- 2006 events & contests calendar
- Current UK band plans
- European locator map
- Prefix guide
- Repeater listings
- QSL bureau information
- Handy lists of abbreviations & codes
- And much more

A must for every shack this logbook is far more than a standard logbook yet it is the same price!
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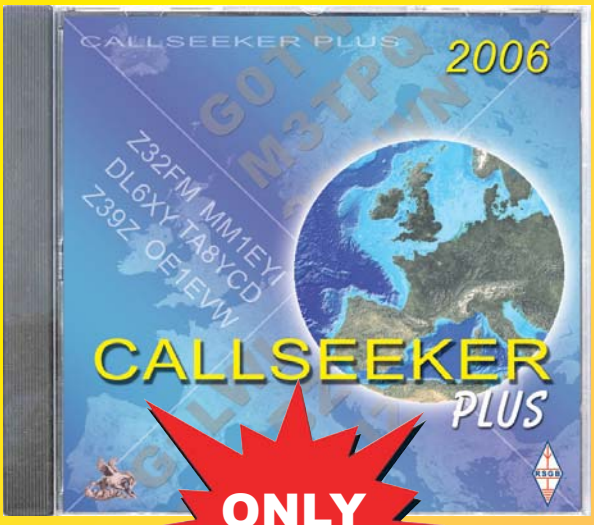

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MFJ

MFJ-259Z *NEW*

The famous antenna analyzer from MFJ has had a revamp. Now you get the analyser plus built-in Ni-MH battery pack and AC charger and also a "dip meter" type coupling coil that can check trap resonances.

MFJ-259Z Turns hours into minutes and Ideas into Antennas!

Brief Specification: ** 1.8 - 170MHz * Built-in Ni-MH pack * AC charger and power supply * Dip Meter coil * DC Voltage display * VSWR digital and analogue * Resistance and Reactance * Coax diagnostics including dB loss * Capacity in from a few pF to several thousand pF * Inductance from 1uH to 60uH * Distance to coax fault * Resonance mode * Velocity factor * RF transformer and balun testing * Frequency counting mode.*

INTRODUCTORY PRICE £199.95 B

AL-811XCE £699.95 C

This amplifier uses three AL-811A tubes to give up to 600W PEP output. Built-in 230V AC supply and dual meters. Quiet cooling and instant by-pass switch. Get your signal heard around the world!

MFJ-948 £119.95 B

Another all-time best seller, this 300W ATU covers 1.8 - 30MHz and handles wire, coax and balanced feed. It is widely used for base station use. Cross-needle meters make adjustment very easy and precise.

MFJ-914 £56.95 A

Not so widely known, but very useful for all HF solid state radios. Place this in series with your coax feed and it allows you to tune antennas that your internal ATU could not manage - like G5RV on some bands. Great idea.

MFJ-910 £22.95 A

If you are interested in mobile operation you will know that the feed impedance of the antenna is very low - you just the VSWR down low! Put this in series and the VSWR comes way down - just switch for best match 3.5 - 30MHz 200W

MFJ-991 *New Auto ATU* £179.95 B

This ATU is very similar to the MFJ-993 but only handles 150W, does not handle balanced feed and has no antenna switch or LCD display. The bare bones at a great price!

MFJ-1026 £149.95 B

A little know product that could transform your listening pleasure. This is designed to remove electrical noise by phasing it out and it really works! Can fit in-line with transceiver. Radio signals remain whilst local eletrical noise is greatly reduced!

MFJ-417 £49.95 B

A budget Morse tutor that is extremely small and convenient to carry. Sends characters, text and can even simulate QSO's from its data base! Runs from 3 - 35 wpm using internal battery (not supplied). Has headphone socket and volume control. Great buy!!

MFJ-704 £42.95 B

Yet another MFJ item that should be in your shack. A low pass filter cleans up the output of your transceiver and reduces the risk of interference to a wide range of domestic products. A small price to pay for peace and quiet. This one handles up to 1kW with bandpass range of 1.8 - 30MHz.

MFJ-969 £169.95 C

This 300W ATU covers 1.8 - 60MHz and matches long wires, coax and balanced feeder. The cross-needle meter makes adjustment easy and it has a great PEP circuit.

MFJ-901B £72.95 B

If you are looking for a 200W ATU from 1.8 - 30MHz with a tight budget, this is the job. 200W rating and handles wire, coax and balanced feed. Needs and external VSWR meter or you can use the one in your rig.

MFJ-902 £65.95 B

We sell these by the bucket load because they are a great design. This ATU is known as the Travel Tuner and measures just 9- x 60 x 80 (mm). 3.5 - 30MHz 150W. It will handle wire or coax systems. MFJ-902H adds balanced feed. **£99.95**

MFJ-974 £159.95 C

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.

MFJ-260C £33.95 B

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**

MFJ-1704 £59.95 B

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.
180 x 60 x 80 (mm).

MFJ-993 *New Auto ATU* £209.95 C

At last, an auto ATU that is low cost, and handles wire, coax and balanced feeder. Covering 1.8 - 30MHz up to 300W and includes and antenna swich. It learns as it goes and remembers previous settings for speedy tuning. You also get digital and analogue readings and an optional audio indicator for those with poor sight.

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!

Telephone Enquiries 01702 206835/204965

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Made For You!

WM-308 £59.95 B

Base Microphone
**500-50k Ohm match*
**Built-in pre-amp*
**Adjustable Output*
**Electronic PTT*
**Electronic latching*
**Adjustable goose neck*
**FM/SSB response switch*
**2xAA cells (2mA)*

QS-112 £16.95 A

Speaker Mic
**Compact & lightweight*
**Versions for most radios*
**PTT side button*
**Curly cord*
**Electret insert*
**High quality speaker*

WEP-501 £19.95 A

Adjustable headset with boom mic
**Swivel boom adjustment*
**Lightweight earpiece*
**Adjusts for right or left ear*
**PTT in-line switch with belt clip*
**2-pin connectors for Yaesu, Kenwood and Motorola*
**32 Ohm earpiece*
**1k Ohm electret mic capsule*

WCT-421 £19.95 A

Earpiece
**Clip-over ear*
**Beige coloured*
**Clip-on Lapel mic. with adjustable tail*
**Mic. tail hangs from clip*
**PTT built-in on mic. lead*
**8 Ohm earpiece*

FBI-9 £9.95 A

Earpiece
**8 Ohm impedence*
**Fitted jack plug*
**2m curly lead*
**Beige coloured*
**Soft earclip*
**Removeable pad*
**Very rugged*

WEP-300 £9.95 A

Earpiece
**8 Ohm impedence*
**Fitted 3.5mm plug*
**Clips over ear*
**Secure in use*
**Comfortable long term*

WEP-400 £14.95 A

Earpiece
**8 Ohm impedence*
**Fitted 3.5mm plug*
**Soft earclip*
**Removeable pad*
**Very comfortable*

SP-160 £9.95 A

Mobile Speaker
**8 Ohm impedence*
**Power rating 1.5W*
**3m of lead*
**3.5mm mono plug*
**Adjustable mount*
**Size 97x67x27mm*
**Weight 165g*

SP-170F £12.95 A

Mobile Speaker
**8 Ohm impedence*
**Power rating 1.5W*
**Variable Volume cntl*
**Audio Filter*
**Switchable On/Off*
**3m of lead*
**Mobile mount*
**Weight 189g*

**Fitted 3.5mmplug*
**Size 97x67x27mm*

V-1000 £10.95 A

Fast Battery Charger
**Charge up to 4 Ni-Cad cells in 60 mins*
**Charge up to 4 Ni-MH cells in 2 hours*
**Microprocessor controlled *Battery Life protector *-dV cut-off function *Reverse polarity and short circuit protected *Bad battery detection*

V-868 £11.95 A

8-Way Battery Charger
**Charge up to 8 cells *Suits Ni-MH or Ni-Cd *Charges in 5-8 Hours*
**Charge AA & AAA cells together *230V AC Input *Ni-Cds charge in 5 hrs *Ni-MH charge in 8 hrs *Switches off automatically once cells are charged*

FD-7021 £24.95 B

Portable Power Station
**Built-In emergency work light *12V 4Ah Sealed lead-acid battery *Max current 12A *12V output *Seperate 3V 1A/6V 1A/9V 1A outputs *Battery level meter *2x 12V cigerette lighter socket outputs *Shoulder Strap *Fold-away carry holder *AC Charger *180x85x210mm *3kg*

CH-1-150 £32.95 B

Portable Power Station
**12V 7Ah Sealed lead-acid battery *12V cigar socket output *150W 240V output (13A socket) *200,000 Candle power spotlight *Dual 6W fluorescent tube lantern *Blinker warning light *Cartridge fuses *8 hrs lantern, 15hrs spotlight *AC Charger *5.5kg*

CON-K £49.95 B

Coax Connector Kit. Comprises a set of coax Connector adaptors. 6 Threaded interconnectors enable any of the supplied plugs and sockets to be assembled back to back to form the adaptor of your choice.

WAL-55 £7.95 A

Alloy Antenna Wire, each reel contains 16.76m (55ft) of 3.5mm alloy wire, ideal for G5RV's etc. Its ultra light - weighing 400g! This alloy wire will not tarnish like copper and its light weight means safer antennas.

KEVLAR £22.95 A

**1.905mm (0.075in) diameter*
**60.96m (200ft) spools*
**Colour: Black*
**181.4kg (400lb strain)*
**By weight it is stronger than steel *Outer protective layer of Dacron *Will not stretch *Not affected by sunlight.*

WISP-150 £22.95 A

150W DC-AC Inverter
**Input: 10-15V DC Peak load 15 Amps *Output: 230V 50Hz to 150W (450W surge)*
**Standby current 210mV*
**Efficiency 90% *Low voltage shutdown and alarm*
**Thermal protection 60°C *Overload & short circuit protect *Reverse volts & 24v batt protected.*

WISP-300 £29.95 A

300W DC-AC Inverter
**Input: 10-15V DC Peak load 30 Amps *Output: 230V 50Hz to 300W (900W surge) *Standby current 320mV *Efficiency 90%*
**Low voltage shutdown and alarm *Thermal protection 60°C *Thermal fan *Overload & shortcircuit protect *Reverse volts & 24V batt protected.*

SMP-1000A £9.95 A

Switch mode AC/DC Adaptor
**Input: 100-240V AC 50/60Hz*
**Output: 3, 4.5, 5, 6, 9 & 12V DC*
**Regulated*
**6 connectors*
**Cable length 1.8m*

**Max current 1000mA*
**Reversible connectors*

PINHOLE GLASSES £22.95 A

Pinhole Glasses
**Read panel text without a magnifying glass *Improve your close and distance vision*
**Improve contrast and colour vibrancy*
**Excercises your eye muscles *No prescription needed *Based on scientific "pinhole" effect*

WDB-32 £12.95 A

VHF/UHF Handheld Antenna
**Tx/Rx: 144, 430 & 1250MHz*
**Rx: 120/300/450/800MHz*
**10W Max power handling*
**4.5cm long*
**BNC fitting*

WSMA-450 £12.95 A

Just 4.5cm Long!

VHF/UHF Handheld Antenna
**Tx/Rx: 144, 430 & 1200MHz*
**Rx:120/150/300/450/800MHz*
**10W Max power handling*
**4.5cm long*
**SMA fitting*

WSMA-7000 £14.95 A

VHF/UHF Handheld Antenna
**Tx/Rx: 144 & 430MHz*
**10W Max power handling*
**17.7cm long*
**SMA fitting*
**Weight 36g*

WGM-270 £29.95 B

VHF/UHF On-Glass Antenna
**Tx: 144/433MHz*
**2.5dB gain*
**VSWR 1.5:1*
**50W handling*
**Screw-on whip*
**4.26m + PL-259*
**698.5mm long*

WSM-270 £19.95 A

VHF/UHF Mini-Mag Antenna
**Tx: 144-146 & 430-440MHz*
**2.15dBi, 6.15dBi*
**50W max*
**Micro Magnetic 29mm base*
**Element length 0.46m*
**2.75m mini coax with BNC*

W-300S/T £39.95 B

Triple Mag Mount from Watson, comprises 3 x 127mm magnetic mounts. The 'S' version has S)-239 socket with 5m coax cable and PL-259 plug. The 'T' version has 3/8in socket with 5m coax cable and PL-259 plug.

WM-14B £12.95 B

Large 14cm diameter magnetic mount which offers extremely good adhesion and houses a very strong magnet. Antenna connection via SO-239 socket, and comes with 5m RG-58 cable terminated in a PL-259 plug.

WM-08B £9.95 A

Compact 8cm diameter magnetic mount offering good adhesion for such a compact size. Antenna connection via SO-239 socket, and comes with 5m RG-58 cable terminated in a PL-259 plug.

ROTATORS

CREATE RC5-1 £369.95 C

Designed for medium sized antennas such as 3/4 element HF beams or large VHF/UHF arrays.

**Rotation torque: 6kg/m *Brake torque: 80kg/m *Max vert load: 400kg *Max horiz load: 800kg *Mast size: 48-63mm *360 Rotation time: 60-150sec/50Hz *Power: 230V AC 80VA *5kg *Cable: 7 core*

CREATE RC5-3 £449.95 C

Similar to RC5-1, the control box includes preset control which sets direction automatically.

**Rotation torque: 6kg/m *Brake torque: 90kg/m *Max vert load: 400kg *Max horiz load: 800kg *Mast size: 48-63mm *360 Rotation time: 60-150sec/50Hz *Power: 230V AC 80VA *5kg *Cable: 7 core*

CREATE RC-5A-3 £649.95 C

A Heavy duty rotator for large HF antennas and VHF/UHF arrays, control box includes preset.

**Rotation torque: 22kg/m *Brake torque: 200kg/m *Max vert load: 700kg *Max horiz load: 1000kg *Mast size: 48-63mm *360 Rotation time: 60-150sec/50Hz *Power: 230V AC 80VA *5kg *Cable: 7 core*

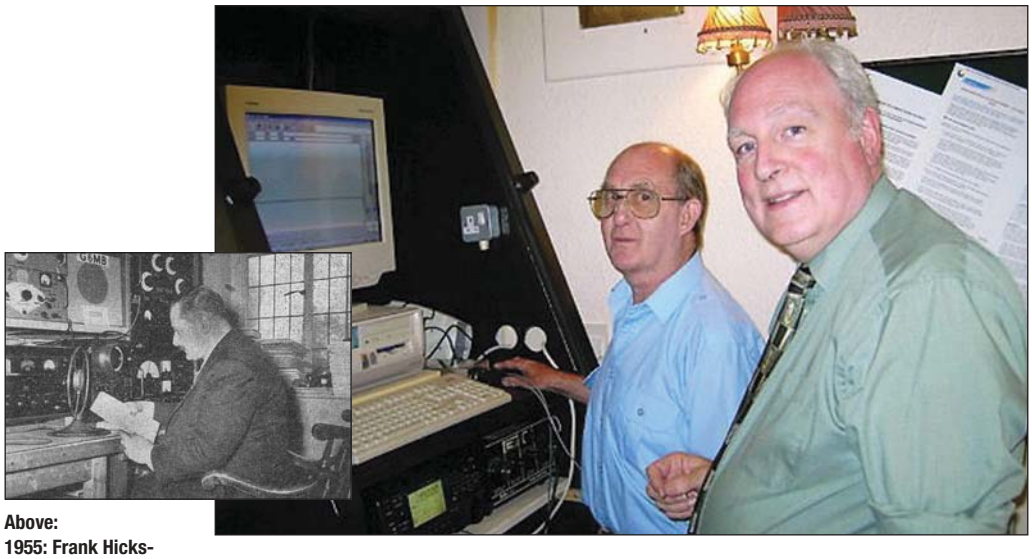
50 not out

The RSGB's weekly news bulletin service GB2RS is celebrating its 50th anniversary this year. GB2RS news manager Gordon L Adams traces the bulletin from its foundation back in 1955 to today.

Can you remember anything about the year 1955? I can, because I was in my last year at school and studying for my GCE "A" levels. I even sat the City & Guilds Radio Amateurs' Examination. What was it like living in those days? Well, you are unlikely to know much about it unless you are at least 60.

Television in the United Kingdom then consisted of just one BBC monopoly channel, and the picture was made up of 405 scanning lines in black and white. Most TV sets had two control knobs for on/off/volume and brightness. A separate contrast control and horizontal and vertical hold presets were usually to be found behind a hidden panel. Until 1955, the BBC's charter had expressly prohibited advertising, and even in TV plays and sitcoms, any product labels had their brand names carefully masked over.

However, all this changed in September 1955, because Independent Television was launched at 7.15pm on 22 September 1955. For some weeks prior to the launch, Belling & Lee Limited had operated a low power TV transmitter using the callsign G9AED from close to the first ITA transmitter site at Beulah Hill, Croydon. This was intended to assist with the orientation of the new Band-3 Yagi receiving antennas, and it operated on channel-9 vision frequency 194.75MHz. I still have their QSL card – the only G9 prefix in my collection.



Above:
1955: Frank Hicks-Arnold G6MB reading the very first official GB2RS News Bulletin at his home station in Walton-on-Thames, Surrey on 25th September 1955.

Above right:
2005: David Brooks, G0VIE, and Alaster Bruce M1DFO, left, setting up the North Cheshire Radio Club GB2RS MT63 data transmission. Photo by Gordon Adams, G3LEQ.

BREACHING THE MONOPOLY

Thus on the night of 22 September 1955 ITV launched under the aegis of Associated-Rediffusion; and the channel's very first advertisement was a view of a Gibbs SR toothpaste tube seen through a block of ice. The BBC had decided to scoop this event, and leaked to the press that a major incident was to take place in its weekday radio serial The Archers. This ran on the "Light Programme" at 6.45pm. The incident turned out to be the death of Grace Archer in a dramatic stables' fire. The show held over eight million radio listeners spellbound during the build-up to the ITV opening programme.

What has this got to do with amateur radio you might be wondering? Well, it was in this climate of monopoly broadcasting that the RSGB had spent nearly three years negotiating with the Post Master General for permission to launch an amateur radio news service.

This was finally achieved on 25 September 1955 and the progress towards the launch of GB2RS and its subsequent development is worthy of celebration.

Late in 1967 the RSGB published the first edition of a book entitled "The World at their Fingertips" by John Clarricoats OBE, G6CL. The book was sub-titled "The Story of Amateur Radio in the United Kingdom and a History of the Radio Society of Great Britain". Clarricoats, or "Clarri" as he was affectionately known, was well qualified to write about the RSGB's first 50 years – he had served as its secretary from 1930 until 1963. In chapter 25, he recorded the following: "On many occasions prior to, and during the war, the suggestion had been made that the Society should seek permission to introduce a weekly news bulletin service for members".

Years passed, and it was not to be realised until some ten years after the war had ended. Chapter 29 records the final achievement of this goal: "On Sunday, September 25, 1955, an ambition of the Amateur Radio movement in the United Kingdom was fulfilled (see "RSGB Bulletin" Vol.XXXI No.3), when at 10.00 GMT that day the first RSGB News Bulletin was broadcast from the station of Council member Frank Hicks-Arnold G6MB of Walton-on-Thames, Surrey, using the Headquarters call sign GB2RS."

BLOOD, SWEAT AND TEARS!

Although the paragraph continued with a little more general information, it did not detail the long drawn-out efforts that had gone into making the RSGB's news service a reality. As stated earlier, a news broadcast had become a goal of the Society soon after the war had ended. Perhaps the most accurate record can be found in the minutes of the Council and Technical Committee (TC) meetings around this time. The TC minutes of 30 September 1953 make what is possibly the earliest reference, stating that the General Post Office (GPO) had declined to allow the HQ station GB1RS to be used for broadcasting purposes. Fred Charman G6CJ, who had been President in 1952, pointed out that a number of national radio societies were officially authorised to broadcast news to their members. These included the ARRL (using the call-sign W1AW), the SARRL and the WIA. The secretary therefore agreed to enquire what news broadcasting arrangements these national societies had - if any.

It needs to be explained at this point, that after prolonged discussions with the GPO, the RSGB had been permitted to establish a frequency marker station under the special callsign GB1RS. This had been brought into operation on 1 September 1948 to provide an hourly marker signal on 3500.25kc/s from 06.00 to 24.00hours GMT daily. The equipment had been donated by EMI Limited and The Synchronome Company, and was installed at the Society's HQ in New Ruskin House, Holborn, London. However, it only stayed in service for about two and a half years, being terminated in February 1951.

At the TC meeting held on 19 January 1954, the secretary reported that the majority of national societies were authorised to transmit news bul-

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letins to their members. He said that the GPO might be willing to grant limited facilities to the RSGB to broadcast items of general information to members. Several members of the TC thought that any initial broadcasts should be made in Morse telegraphy. Before further progress could be made, the RSGB had first to establish a new location for the HQ station equipment, which had been employed under the call sign GB1RS. In November Louis Varney G5RV, who worked for Marconi and lived in Chelmsford, Essex, stated that he would be pleased to be entrusted with the responsibility of operating the HQ station from his home.

At a meeting on 11 February 1954, the TC decided that Louis's offer should be accepted. It was further agreed that the bulletins would be of about 15-minutes duration and would go out on Sundays at 11.00am local time. It was also stated that the transmissions would be made in Morse telegraphy, at between 12 and 18wpm, in the CW portion of the 3.5Mc/s (sic) band using the call sign GB3RS. It was agreed that the GPO should be approached accordingly.

PROPAGATION TESTS

In order to establish the reliability of a single transmission propagating across the UK during daytime, the secretary, G6CL, asked Jimmy Porter, GI3GGY, in Londonderry to carry out some test transmissions from his home in Northern Ireland on the 40m frequency 7047.5kc/s using AM telephony. Jimmy commenced an experimental news reading under his own call sign on 14 March 1954. This unofficial experiment explains the half-century of "news reading" by GI3GGY that was featured in the June 2004 edition of RadCom.

In the meantime, on 29 April 1954, president Arthur Milne, G2MI, general secretary John Clarricoats, G6CL, Louis Varney and TC chairman Harry Clark, G6OT, met with DC Balaam of the GPO to discuss the RSGB's proposals. They advised him that 20 of the 24 IARU societies that they had approached had confirmed that they were officially authorised to operate amateur news bulletin services. They agreed to provide DC Balaam with a series of six "typical messages".

OBFUSCATION?

At the TC meeting of 19 September 1954, the secretary reported that the GPO "were not yet in a position to give a reply to the RSGB's request for permission to operate a News Bulletin Service". The GPO explained to the Society that "the proposal raised issues of rather wide import, which needed careful scrutiny". Tentative enquiries revealed that the GPO's reluctance was due to concerns that the BBC might oppose the RSGB "broadcasting to the public".

At a follow-up meeting in the GPO Headquarters at St. Martins-le-Grand in London on 20th July 1955, EM Perry of the GPO advised the RSGB that the GPO was now prepared to allow the society to "broadcast news bulletins to its members". During the same meeting it was agreed "that the broadcasts would be made on Sunday mornings on a frequency in the 3.5 to 3.8Mc/s band, and that telephony and/or telegraphy may be used". Initially, it was suggested that a new RSGB HQ call sign GB3RS should be employed, and not the previous marker station call sign GB1RS. Arthur Milne, G2MI, now the immediate past-president, said he would be prepared to operate the station. The GPO also stated that it was prepared to consider requests from the RSGB to broadcast on a band additional to 3.5Mc/s.

At a council meeting on 16 August 1955, Frank Hicks-Arnold, G6MB, was nominated to be the main station operator, while Arthur was appointed to operate from his own station in a standby capacity. The general secretary was asked to write the weekly news scripts. It was also decided that the frequency to be employed would be 3600kc/s, and that the transmission would comprise a voice bulletin, followed by a Morse telegraphy summary and then a voice repeat.

LAUNCH DATE SET

On 13 September 1955, the general secretary reported that the GPO had issued the call sign GB2RS for news reading purposes, and that the service would start at 11.00hours BST on Sunday 25 September 1955. He further stated that the GPO was holding in reserve the call sign GB1RS in case the RSGB wished to introduce some other special service at a later date. He explained that the call sign GB3RS would continue to be held by the RSGB's Headquarters station for use on such occasions as the RSGB required.

The 10 October 1955 meeting of Council resulted in a minute, which read as follows. "The News Bulletin Service commenced at 11.00hours BST on Sunday 25th September 1955. By first post the following morning more than 50 reports of reception were received at Headquarters. The reports were sent

Below, left to right: Army cadet operator Trevor Haslam, G3XSI, of Sheffield at a transmitter type 12 and communications receiver. R107

Sunday 14 February 1965 – GB2RS news broadcast number 232 by Fred Ward, G2CVV (standing) and RSGB secretary John Clarricoates, G6CL. Picture courtesy G3TOV.

November 1988 – Fred Ward, G2CVV, presents GB2RS reader Harry Sills, G8QZ, with a certificate of merit award.

PICTURE COURTESY G3XSI.

PICTURE COURTESY G3TOV.

PHOTO BY G8BAV.

to Mr Hicks-Arnold G6MB for acknowledgement." In a separate minute it was stated that some correspondents had expressed a view that the news bulletin should be transmitted at a different hour to avoid a clash with church services. It was therefore resolved by the RSGB's council that the news bulletin should start at 10.00 local time with effect from Sunday 27 November 1955. It was also felt that propagation on 80m across the UK would be slightly better at the new time. It was finally minuted that EH Hutchins of Boscombe, Hampshire had kindly donated a special vibration-free microphone holder for use at the GB2RS station, and this is featured in the accompanying photograph of Frank Hicks-Arnold, G6MB, at his operating desk.

On 14 May 1956, the secretary informed the council that the GPO had agreed to a transmission being introduced in the 7Mc/s band. This subsequently commenced some time later on 7047.5kc/s under the GB2RS call sign from the station of Jimmy Porter, GI3GGY, in Londonderry, Northern Ireland; Jimmy was later assisted by Sidney Foster, GI3GAL. However, the repeat of the telephony news reading was felt to be superfluous, and this was discontinued as from 1st July 1956.

FRED IS LISTENING!

The GPO felt it necessary to monitor the GB2RS broadcasts. Listening to the voice transmissions posed no difficulty, but the GPO needed an operator with telegraphy skills to monitor the Morse code summaries. Fred Ward, G2CVV, was appointed to carry out this duty. Fred, unusually, had served in both the Army and the Air Force during the Second World War, joining the GPO Radio Investigation Service (RIS) when the war ended. Initially, he was based in Derby, but later he was transferred by the RIS to Birmingham. Early in the Summer of 1960 he became a voice news reader for GB2RS. The Morse summary had by then been discontinued. Later, he was joined by Harry Sills, G8QZ. Harry made 1,425 news broadcasts and was awarded a "Certificate of Merit" by Fred on behalf of the RSGB in 1998. Fred served as a president of the Society in 1971 and sadly passed away on 4 January 2003. Harry died in September of that year.

Fred made his station available on 17 April 1988 for then RSGB president Sir Richard (Dick) Davies, G2XM, to announce that the society's patron, HRH The Prince Philip, Duke of Edinburgh, KG, KT, was to open the RSGB's 75th Anniversary Convention at the National Exhibition Centre in Birmingham on Friday 15 July 1988 - see photograph.

From August 1963 until November 1997 Jack Hargreaves G5VO, read the news on 80m from Bridlington. Jack was also a National Network monitor for the CCF/ACF military cadet operators in the late 1950s. They could be heard on a number of frequencies, between the amateur bands, including 5205kHz, which was designated as "Lima Uniform". This was a time when many budding radio amateurs first cut their teeth operating Army 12-set transmitters and their associated R107 receivers (see photograph). The Air Force also encouraged interest in the hobby of amateur radio, and those who were active at the time may remember the RAFARS amateur radio broadcasts that were put out from RAF Locking in Somerset on 5105kHz under the call sign MRM ("Mike Romeo Mike").

Two other news readers who have served for more than 30-years are Gordon Adams, G3LEQ, who joined GB2RS from Knutsford, Cheshire in January 1972, and Jim Grieve, G4ARZ, who started reading on 10 June 1973 from Edenbridge, Kent (see photograph). By co-incidence, they had both attended the same school where cadet force activities played a prominent role. Jim still reads the initial bulletin of the day on most Sundays at 09.00 hours on 3640kHz, whilst Gordon frequently reads the closing bulletin at 21.30 hours on 1990kHz, and more recently some of the experimental bulletins on 5403.5kHz. During the 1980s Gordon tested some NBFM voice readings on 7MHz, and also transmitted parts of the national news in Morse code at speeds of 15 up to 30wpm using frequency shift keying (mode F1A), with 850Hz shift.

Top:
Sunday 17 April 1988 - Sir Richard (Dick) Davies, G2XM, RSGB president, announcing on GB2RS that the RSGB's patron, HRH The Prince Philip, Duke of Edinburgh, will open the society's 75th Anniversary Convention at the National Exhibition Centre in Birmingham.

Bottom:
James Grieve, G4ARZ, of Edenbridge, Kent at the controls of his station. He started GB2RS news reading in June 1973, when he took over from G2ABC.

PHOTO BY G3SZJ

WEB SEARCH	
GB2RS news	www.rsgb.org.uk/news
GB2RS voice news	homepage.ntlworld.com/g4njh2/rsgb.html

ACCOMPANYING PICTURES - WHATEVER NEXT?

During the 1980s, Gordon, G3LEQ, pioneered some readings with an accompanying colour TV picture in the 435MHz band. Besides appearing on screen himself along with a view of his station, he also interspersed the pictures with a colour version of the script. This was created using a Prestel editing desk, which produced 38 columns of characters in the well-known Ceefax and Oracle formats. Later Roy Powers, G8CKN, introduced similar ATV pictures backing up his news readings via the High Wycombe ATV repeater GB3HV on 1308MHz. Two years ago, Chris Delhaye, G3NDJ, joined in with pictures over the Brighton ATV repeater GB3VR on 1316MHz.

Whilst we do not have the ability to produce up-to-the-minute weekly moving pictures to accompany the news script at the moment, the recent appearance of digital cameras with movie clip facilities could well change this.

For the last 18-months, we have been putting out data news bulletins using the MT63 mode on 1992kHz, 3592kHz, 5279kHz, 7092kHz and/or 14109.5kHz. The choice between 7MHz and 14MHz is being made according to propagation conditions around the transmission times of 20.15 and 20.45 on Sundays. David Brooks, G0VIE (hardware) and Alaster Bruce, M1DFO (software), are pictured delivering the data news from the North Cheshire Radio Club station GX0BAA (see photograph). Steve Richards, G4HPE, and Gordon Adams, G3LEQ, also transmit the MT63 material. However, for these transmissions to become a permanent feature we need more volunteers to send the data. Their weekly appearance could become a valuable Raynet information distribution mechanism

Our GB2RS newsreaders are a dedicated bunch. I have not the space to record here all of our 140 plus readers, or indeed their contributions on VHF and UHF. Suffice it to say that they all play a much-appreciated role in getting the news out on the air. Jeremy Boot, G4NJH, also supplies a voice reading via the internet. We intend to celebrate all this activity on Sunday 25 September 2005, exactly 50-years after the original broadcast, and on the following four Sundays in October, using the special broadcast-only call sign GB50RS. Some other commemorative ideas are in the pipeline at the time of writing. If you have a last-minute idea, or would like to take part, then contact me.

I would like to thank John Crabbe, G3WFM, RSGB honorary librarian and museum manager, for his valuable assistance in researching the society's archives for me. ♦

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Club class

In honour of the huge contribution to the hobby made by local clubs across the country, RadCom profiles a selection of amateur radio clubs.

The numerous local clubs dotted around the country are the lifeblood of amateur radio. If it wasn't for the hard work, expertise and enthusiasm of club members, amateur radio would be nowhere near as popular as it is today.

Amateur radio clubs play a hugely important role in introducing the hobby to new people, helping those new to amateur radio obtain their licenses and sharing the knowledge and expertise of technical matters that are so vital in this hobby.

The clubs also provide a chance for amateur radio enthusiasts to socialise with like-minded people. Many people who join clubs not only end up becoming experts in amateur radio technology but also form friendships that last for decades.

The Radio Society of Great Britain is keenly aware of the enormous contribution clubs have made to amateur radio in this country. It therefore aims to do everything it can to ensure that the club network continues to thrive.

One way that the society aims to achieve this is by publicising club activities both in RadCom and its Yearbook (see Book review – page 34).

For example, the 2006 edition of the Yearbook will feature an extensive new section dedicated to clubs. The book lists venues, meeting times and a short description of numerous amateur radio clubs.

RadCom is also planning a special new feature – Club of the Month – in which we profile an amateur radio club in each issue of the magazine. To have your club considered for the Club of the Month spot, send your RSGB regional manager a 500 word overview of the club, details of the venue and meeting times, the name of the club president and contact information.

Here, we provide information on a selection of clubs that have done admirable work in popularising amateur radio in the UK.

WIGTOWNSHIRE ARC

The Wigtownshire Amateur Radio Club was founded in 1980 by a group of amateurs living in the Stranraer area. As with most clubs we have had our highs and lows, but at the moment we are enjoying a very buoyant time.

We meet every Thursday at the Stranraer Academy and currently have 40 members who travel from all parts of our region, some making as much as a 120 mile round trip every week.

Our yearly calendar includes guest speakers on all manner of topics, not just radio-related items, social events such as fox hunts, a summer BBQ and treasure hunt, some special event stations and of course our Christmas dinner.

We enjoy a very good working relationship with our local community learning department who have given us a shack and meeting facilities within the school. We have recently become a registered examination centre (April 2005) but we have been running Foundation courses for approximately two years.

Information can be found on our web site at www.gm4riv.co.uk

Members of the Wigtownshire ARC

SOUTH DORSET RS

I would like to introduce the South Dorset Radio Society, which is based at Chickerell Youth Club Hall, Rashley Road, Chickerell, Weymouth (you will find directions on our web site: www.sdrs.tk).

We have approximately 50 members (at the last count) and they range in age from 16 to 80+. All have varied degrees of skills within the radio environment. We have two qualified instructors and facilities for training and exams are available for learning and taking the Foundation, Intermediate and Advanced exams. We also have facilities for the tutorship of mentally and physically handicapped people.

We take part in all the usual events; Windmills on the Air, International Marconi Day, Museums on the Air and Lighthouses/Ships on the Air. If there is a special event taking place and we can muster a crew (which we usually can) we will take out a special callsign and NoV to do that as well. We have done three already this year, during which we also put on exhibitions of the equipment of the era or project that is taking place.

We like to think we are a friendly club, with everybody willing to help each other if possible. On most aspects of the hobby there is usually a member who knows a particular part better than others.

We meet every second Tuesday of the month except August, when we have a break. The doors open for the meeting at 7:00pm for a 7:30 start, and we generally finish around 10:00pm. We have guest speakers on varying subjects and who come from many parts of the country to give informative and interesting talks. Our own members also give talks on the particular part of the hobby that interests them most, and very interesting these are too.

Please come along to one of our meetings in the future as a visitor or speaker. You will be made very welcome and at the end of the talk or event there is always tea, coffee, homemade cakes and biscuits available at a donation of 50p per person.

Please contact Carol on 01305 820400 or e-mail: carolonfraggle@tiscali.co.uk for more information or to make a date.

NORTH WAKEFIELD RC

Contesting, VHF DXing, moonbounce, construction, QRP, PSK31, amateur TV, Internet linking, Islands on the Air, Summits on the Air. The list goes on. With over 100 members, whatever you're into, you'll find someone who does it at our club. We also extend a warm welcome to all at our superbly equipped contest site, close to the M1/M62 network.

Some of our club activities include:

- Courses throughout the year for Foundation, Intermediate and Advanced licences.
- Special event stations at lighthouses, steam rallies and community events.
- Entries into most of the major contests.
- Links are being forged to start amateur radio activity in our local schools.

Come along and meet us in our own shack and bar at East Ardsley Cricket Club, Jeffery Field, East Ardsley, Wakefield WF3 2HB. Contact John Muzyka, G4RCG (Chairman), tel 01924 362144, or Nigel Wears, 2E0NJW (PRO), tel 0113 253 0558. Web site www.g4nok.org

HILDERSTONE RADIO AND ELECTRONICS CLUB

We meet on the second and fourth Fridays of the month at Hilderstone Adult Education Centre, St Peters Road, Broadstairs. We cover a wide range of interests in amateur radio, electronics and computers. The club enjoys talks on all aspects of the hobby and welcomes guest speakers.

At the high tech end of the spectrum we had talks about Echolink and repeater linking, and we look forward to learning more about VoIP and associated topics soon. A 1.2GHz TV repeater is being planned, which has given rise to a TV transceiver construction project for club members. Talks on basic TV principles and PLL chips and a demonstration have laid the foundations for this ambitious project.

Guest speakers have entertained and informed us with topics as diverse as Tesla coils and the latest information on the new licence structure. A demonstration of building a multi-band HF vertical antenna has resulted in several members planning to build them. We have also been entertained by a few talks that are not directly radio orientated.

Our annual Work the World on a Wok weekend raised £250 for Receiver Ward at the Queen Elizabeth, Queen Mother Hospital, Margate.

Fox hunts on 2m mobile and 70cm pedestrian have been very popular and keenly contested. Experimentation with DF antennae and equipment has led to much discussion. In view of this, the latest club project is for members to build 160m DF receivers based on a simple MW radio.

We are very fortunate to have Dr Ken Smith, G3JIX, as our president. His great knowledge and ability to explain almost anything from basic electrical and radio theory to the mysteries of the universe in the simplest of terms means that natter nights (we don't have too many) usually result in an entertaining and educational session of answers to members' questions.

Le Shack, recently built in a member's garden, is available to club members from time to time for projects and equipment testing.

The club is keen to promote the hobby and offers courses and examinations from Foundation to Advanced. We have a few younger members, including Connor, M3CJW, who passed his Foundation licence exam at seven years old!

HREC embraces every aspect of our hobby but, in addition, encourages its members to share any of their other interests and hobbies.

POLDHU ARC

The club was founded in its present form in 1990 and moved into the newly constructed Marconi Centre in time to celebrate the centenary of the sending of the famous 'S' from the site on the 12 December 1901.

The club has a large number of full members, most of whom live locally, plus many more associate members, both in the UK and overseas, who receive the club newsletter and can visit the club on a limited number of occasions.

The centre is open for members on Tuesday and Friday evenings and there is a more formal meeting on the second Tuesday of each month. We also support International Marconi Day (the Saturday nearest Marconi's birthday) and celebrate the 12 December each year.

There are three well-equipped radio rooms and an antenna farm to die for! We have a three-element beam for 20, 15 and 10m, two W3DZZ trap dipoles and a remotely tuned doublet suspended between two 60ft masts located on almost exactly the site of the original 1901 masts.

Visiting amateurs are welcome to operate from the centre on production of their licence validation document. A small donation will even secure a handsome certificate!

More details can be found on our web site: www.gb2gm.org.uk, or by phoning 01326 241656 for information on Marconi Centre opening times.

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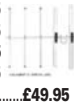

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The MA8040V is a useful and effective DX antenna for the 80m and 40m bands. It is reasonably priced too, reports Peter Hart

Cushcraft MA8040V dual-band

Above:
Antenna in place and ready to go

Below right:
Kit of parts laid out before assembly

There are a number of HF multi-band vertical antennas available of modest size which fit fairly easily into the average garden. Most of these antennas cover the higher HF bands but a rather smaller number extend coverage down to 80m. Many amateurs have a beam of some description for the higher bands but seek an efficient DX antenna for the lower bands. Verticals provide a good DX performance but the choice is very limited for antennas which are optimised and cover just the lower bands. The Bencher/Butternut HF2V is one such antenna and has been available now for over 20 years. Until recently, this antenna had no competition but now Cushcraft has released the MA8040V, a vertical antenna dedicated to the 80m and 40m bands.

DESCRIPTION

The MA8040V comprises a single vertical radiator tapering from $1^3/_8$ in at the bottom to $1^1/_8$in, with the feedpoint at the base and requires a ground radial system. The total height is between 23ft and 27ft depending on which part of the 80m band the antenna has been set-up for. This is substantially shorter than a quarter wavelength on 40m and shorter than an eighth wavelength on 80m and series loading inductors are used to bring the antenna into resonance.

The position of the loading coil in a short vertical antenna is influenced by a number of conflicting factors and constraints. From the purely electrical point of view, the higher up that the coil then the longer the section of the radiator that carries a higher current and this is beneficial to the radiation performance of the antenna. However, the value of inductance needed increases as its position moves towards the end of the antenna and this results in either physically large coils with a higher wind loading factor, or smaller coils with thinner wire having lower *Q* factors and hence higher losses. With top loading in particular, a capacity hat is needed to keep the inductor size to manageable proportions and this further increases the wind loading.

The MA8040V uses top loading with separate inductors for 80m and 40m and separate capacity hats for the two bands. In this way a resonance is produced simultaneously on both bands. Relatively small loading coils are used made from enamelled copper wire wound on plastic formers. The bandwidth on 40m is sufficiently wide to be accommodated without any necessary adjustment or tuning. On 80m, the claimed bandwidth is 100kHz and is set to the required part of the band by telescoping adjustment of thinner top tubing sections above the loading coil. In comparison, the Butternut HF2V is loaded near the base but uses a longer radiating element.

An essential part of any quarter-wave resonant vertical antenna system is an effective ground or radial system. The radiation resistance will be very low on 80m due to the short length of the antenna and the efficiency of the antenna highly influenced by the quality of the ground or radials. Time and effort spent on laying down an effective radial system will be amply repaid by improved results. Cushcraft recommend 8 radial wires equally spaced around the antenna, either laid on the ground or buried just below the surface, four 65ft in length and four 35ft in length. If the longer radials cannot be accommodated then a larger number of shorter radials are recommended. A reel of enamelled copper wire (18 gauge) is provided for this purpose in the kit of parts.

The antenna is rated at 1500W PEP and is intended for ground or post mounting. Cushcraft does not provide any mounting accessories but the assembly instructions describe how to install the antenna supported concentrically by a ground post or clamped to the side of a suitable mast or support. Nothing is mentioned in the instructions about guying and the specification does not include a wind survival or a wind loading rating. Considering the additional wind loading presented by the top mounted inductors and capacity hats, I would recommend a single set of guys about 8ft up from the base. This will reduce the strain on the antenna mounting and in particular on the fibreglass base insulator. From experience I find that these insulators are the principal source of wear in such an antenna developing a "sloppy" fit over a period of time.

ASSEMBLY AND INSTALLATION

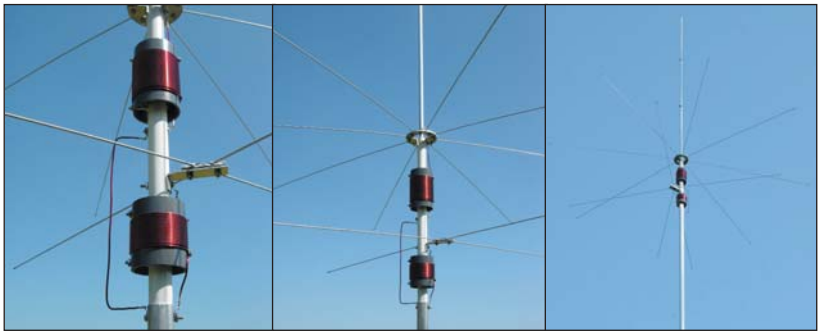
The MA8040V antenna is supplied compactly packed in a box 6.5ft long and about 3.5 x 5in in cross section with a shipping weight of about 14lb. The exact weight is stamped on the box as this is used as a check that no parts are missing. The weight of the antenna is about 9lb, sufficiently light to be installed by one person in calm weather. All tubing parts and brackets are made from aluminium, about 18SWG wall thickness, and all mounting hardware, bolts, nuts, washers and worm clamps are stainless steel or plated. The capacity hat spokes are

Peter Hart, G3SJX

The Willows, Paice Lane, Medstead, Alton, Hants GU34 5PR

E-mail: peter@g3sjx.freeserve.co.uk

vertical antenna for 80/40M



Left to right: Details of the 80m and 40m loading coils

Loading coils and capacity hat mountains

Upper antenna section showing loading coils and capacity hats

thin stainless steel rod.

Assembly is straightforward and accurately described in the 12 page instruction booklet which includes step by step tick boxes and plenty of diagrams. A few spare nuts and washers were provided and overall unpacking, checking and assembly took about 3 hours. The tubing sections mainly telescope together, are slotted at one end and locked in position with hose clamps. Perhaps the most difficult part was fitting the plastic caps on the ends of the capacity hat rods. I needed to pre-stretch these over the tips of fine nosed pliers to make them fit. The antenna starts to get a bit more unwieldy when the capacity hat rods are fitted. Fitting these is most easily accomplished by clamping the resonator assembly vertically in a Workmate or something similar.

I ground mounted the antenna without guys and fitted the recommended set of radials. Tuning involves setting the resonant frequency for the 80m band, 40m is preset and does not require adjustment. Coarse tuning is set during assembly and involves clamping the capacity hat rods in either the longer (lower frequency) or shorter (higher frequency) positions. One rod can also be omitted for use in the upper part of the US phone band. Fine tuning involves setting the length of the upper section telescopic tube to give minimum VSWR on the 50Ω feedline at the desired resonant frequency and a graph is given in the instructions plotting this frequency against tube length. I found this graph fairly accurate and hardly needed to adjust the length any further. Adjustment, however, entails lowering the antenna to gain access to the top section. For ground-mounted operation, this is simply accomplished by separating the antenna at the top of the lowest section.

PRACTICAL RESULTS

Cushcraft recommend using a balun at the feed-point either by coiling a few turns of the coax feeder next to the base or installing a toroidal current choke balun. Construction of a toroidal balun is described in the instructions. I coiled a few turns of feeder but found it made little difference. Using the set of recommended radial wires and with the antenna connected through a short length of 50Ω cable, measurements of the input VSWR are summarised in the table.

	80	40
Min VSWR	1.5-1.7	1.05
Bandwidth 2:1 VSWR	40-70kHz	300kHz
Bandwidth 2.5:1 VSWR	80-100kHz	500kHz
Bandwidth 3:1 VSWR	110-130kHz	700kHz

The 40m performance is close to specification. The variation on 80m represents the difference across the European band allocation, the lower frequencies giving higher VSWRs and narrower bandwidths. Cushcraft claim a typical VSWR at resonance (min VSWR in the table) of 1.1:1. Although this was achieved on 40m, such a low figure on 80m is only likely with a rather poor ground radial system. Indeed with a really good, low loss radial system VSWRs at resonance in excess of 2:1 would be expected. With a minimum VSWR of 1.7:1 there is little margin for detuning away from resonance before 2:1 VSWR is reached. Hence the measured bandwidth at 2:1 VSWR is somewhat less than the specified 100kHz on 80m. Although it was not tried, it is likely that the VSWR at resonance could be improved significantly by placing a shunt inductor across the feed-point. This technique is used with the Butternut HF2V. Folding back the 65ft radials to make them the same length as the 35ft radials made little difference.

The antenna appears to be optimised to the US frequency allocations rather than the UK or European bands. On 40m, minimum VSWR occurred at about 7170kHz with 2:1 VSWR reached at 7020 and 7320kHz. There is no means provided to set the resonance to a lower frequency but it can be done quite easily by attaching some additional wire to the 40m capacity hat rods. Around 5ft of copper wire looped around the rods lowered the resonance to the middle of the European band. Similarly on 80m, with the telescopic top section fully extended, the lowest frequency to which the antenna could be tuned was 3550kHz. The chart in the instructions shows this as well. Some additional wire wrapped around the 80m capacity hat rods or, better still, extending the length of the top section will enable resonance to be achieved in the CW DX sector.

I carried out some direct comparisons with the Butternut HF2V which is my normal antenna for 80 and 40m. Both antennas were set to the same resonant frequency, spaced about 300ft apart to avoid any interaction and fed with coax feeders of similar loss. I could detect virtually no difference between the two antennas in on-air testing on both bands. Very occasionally the MA8040V appeared to have a slight edge but it had a better ground radial system and was better sited (the HF2V is mounted in woodland).

On 80m, comparisons with a low dipole were quite interesting. The dipole was some 1 to 2 S-points better for distances up to 2000-3000 miles but at greater distances the vertical was noticeably superior. This is a typical characteristic of a vertical antenna. On 40m the antenna was most competitive and performed very well.

CONCLUSIONS

The MA8040V is a useful and effective DX antenna for the 80m and 40m bands and at £199.95 inc VAT it is very reasonably priced. Some small tweaks to the resonator assemblies enhances coverage of the CW ends of both bands. Compared with the Butternut HF2V it is cheaper but band extensions are not currently available. Cushcraft is planning to extend coverage to 160m later this year. It is shorter than the Butter-nut which can help in built-up environments but the loading coils and capacity hats can be more visible than narrow tubing. It all depends on circumstances. ♦

ACKNOWLEDGEMENT

The antenna was kindly supplied for review by Waters and Stanton.

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'Transmission' is the annual amateur radio fund-raising event for the British Wireless for the Blind Fund (registered charity number 1078287). This year, 'Transmission 2005' takes place over the weekend of 24 – 25 September.

All radio amateurs are encouraged to take part in order to raise funds for this very worthwhile charity. The idea is that you ask your friends, family, workmates - anyone in fact – to sponsor you for contacts made during the weekend of 24 – 25 September.

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4. The definition of a "contact" for the purposes of 'Transmission' is a two-way exchange of callsign and signal report. Each station may only be contacted once per frequency band *per day*. In other words, every station contacted on 24 September may be contacted again, on the same frequency band(s), on 25 September and that second contact may also be counted towards the overall number of contacts made.

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

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

(c) the individual making the greatest number of contacts during 'Transmission 2005'; and

(d) the group or club making the greatest number of contacts during 'Transmission 2005'.

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

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

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

9. To qualify for the trophies, you *must* return the sponsorship form *and a cheque for the amount raised*, made payable to 'British Wireless for the Blind Fund', to arrive *not later than* 31st October 2005.

To qualify for the trophies for the greatest number of contacts you must state how many contacts were made during 'Transmission 2005' and enclose a copy of the log. Either a *photocopy* of a hand-written log or a hard-copy print-out of a computerised log is acceptable. Please do *not* send the *original* of hand-written logs as they cannot be returned, and do *not* send computerised logs on disk. The minimum information required is the date, time, frequency band, and callsign of station contacted. The log should be signed by the licence-holder (or NoV-holder in the case of GB special event callsigns) as follows: "I certify that this is a true copy of the log-book entry for (callsign) during the period 24 – 25 September 2005. (signature)." Sponsorship forms and cheques returned without log copies will only qualify for the trophies for raising the most funds for BWBF.

To qualify for any trophy you *must* be a current member of the RSGB on 24 September 2005 and be resident in the UK. (However, special certificates will be sent to *all* stations raising more than £10.)

10. The trophies will be presented at the Kempton Radio Fair, which this year takes place at the Kempton Park Race Course on Sunday 13th November 2005. The trophies may be taken home by the winners but must be returned as arranged with BWBF for presentation to the winners of 'Transmission' next year.

Ian White, GM3SEK

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The Palstar ZM-30

Digital antenna impedance bridge

The Palstar ZM-30 offers amateur radio enthusiasts a value-for-money instrument for measuring both R-X impedance and standing-wave ratio, writes Ian White.

The Palstar ZM-30 is the latest entry into the market for test instruments that can measure R-X impedance as well as standing-wave ratio (SWR). In the amateur market, the ZM-30 is competing with the MFJ-259B, MFJ-269, Autek VA1 and AEA-CIA. All of these instruments consist of three elements – a frequency source, an impedance bridge with diode detectors, and an interface to a microprocessor controller and LCD display. So what does the ZM-30 have that the others don't?

The most notable feature is that the frequency source is a crystal-controlled DDS (direct digital synthesis) chip. The rotary tuning knob is actually a digital shaft encoder with a built-in push switch. In contrast, the MFJ and Autek instruments have free-running oscillators, tuned either by a variable capacitor (MFJ) or by variable resistors (Autek). Palstar specifies the operating frequency range of the ZM-30 as 1-30MHz, although it can be tuned to lower frequencies. The MFJ and Autek instruments offer R-X measurements up to 170MHz and 32MHz respectively, although always with decreasing accuracy at higher frequencies.

Since the tuning knob of the ZM-30 is fully digital, it has been programmed to do many other useful things, such as changing the tuning rate (variable in steps from 10MHz down to 10Hz) and acting as a selector for the various menu items offered by the SETUP, MODE and BAND buttons. The ZM-30 always wakes up in the mode that most people want – impedance. The two-line LCD display shows SWR, frequency, R and X in a straightforward way, and I will review that mode in some detail. The other available modes are Capacitance, Inductance and VFO.

The ZM-30 appears to be derived from the American QRP Club's AA908 instrument, a detailed technical description of which can be found on the club's website [1]. Notable features of the ZM-30 are:

- Strong metal case, stable on the bench and fits well in the hand.
- BNC socket connector.
- Balun adapter, for measuring antennas fed with parallel line.
- Audio output option, which allows you to find the frequency of minimum SWR by listening for the dip in tone frequency.
- Power supply is eight AA cells (requires 9-16V, so you can use eight 1.2V rechargeable cells) or an external DC power supply (9-16V, 200mA).
- Software upgrades can be downloaded from Palstar's website and loaded into the ZM-30 from your PC.
- Recalibration facility.

I will return to many of these features later... but for any instrument of this type, the most important question is the accuracy of its impedance measurements.

IMPEDANCE ACCURACY

I evaluated the ZM-30 using very similar tests to an earlier review of the MFJ-269 [2]. The first hurdle is to display correct readings for a 50Ω reference load. The ZM-30 passed this test well, showing either '50 + j0' or '51 + j0' from 1MHz to 30MHz, and an SWR value of 1.0. A more searching test is to see how the instrument handles open- and short-circuit loads, both of which produce a theoretically infinite SWR. The ZM-30 wisely declines to measure open-circuit loads, or indeed any impedance greater than 600Ω, displaying 'Z>600' instead. A good short-circuit load was created by trapping a scrap of aluminium foil inside the BNC input socket. The ZM-30 reported this as '0 + j0' (the correct answer) up to 13MHz, and either '0 +j1' or '0 - j1' from 13 to 22MHz. Somewhere between 22 and 23MHz the reading jumped to '2 +j2' where it remained up to 30MHz. This is a reasonable result, but it does show a typical limitation of these simple microprocessor-based instruments: the results can appear to jump suddenly between one small frequency step and the next. Real-life antennas and most other kinds of test loads simply don't do that. The apparent impedance jumps are almost always due to digital operations, caused by the limited resolution of the 8-bit ADC and the 8-bit processor. Because these jumps do not occur in the real world, there are programming techniques to smooth them out. The ZM-30 is most of the way there, but there is room for further improvement – and unlike other instruments, the ZM-30 software can be upgraded.

The next set of tests was to use a deliberately mismatched load, consisting of four 47Ω chip resistors terminating a 10m length of RG58 coaxial cable. This creates an SWR of about 3.8 at low frequencies, with a rotating phase angle as the frequency is increased. **Table 1** compares the results from the ZM-30 against the 'true' impedance values measured on a calibrated laboratory VNA (Vector Network Analyser). The measurements shown are for amateur bands only, but the following comments are based on a much more detailed frequency sweep from 1 to 30MHz. As with all impedance measuring instruments optimised for a reference impedance of 50Ω, you can expect generally better accuracy at

Table 1
Impedance measurements for a mismatched cable test load

F (MHz)	Test Load [1]			ZM-30		
	R	X	SWR [2]	R	X	SWR
1.8	14.1	12.0	3.75	13	12	3.9
3.5	16.8	23.7	3.71	16	25	3.8
7.0	32.9	55.5	3.79	32	56	3.8
10.1	101.8	90.8	3.89	114	-91	3.8
14.0	117.9	-90.9	3.93	109	-87	3.8
18.1	27.7	-48.6	3.80	24	-41	3.6
21.0	17.1	-23.8	3.66	15	-21	3.8
24.9	14.3	1.2	3.50	14	0	3.5
28.0	17.2	20.8	3.47	17	27	3.7
30.0	22.8	35.8	3.49	24	43	3.8

Note 1: Impedance and SWR measured using a calibrated HP41951A Vector Network Analyser.
Note 2: The SWR should decrease uniformly with frequency because of increasing cable losses, but the increase up to 14MHz is genuine, because the cable impedance in the test load is not exactly 50Ω.

Table 2
Impedance measurements for ZM30-BT balun with 50Ω load

F (MHz)	VNA			ZM-30		
	R	X	SWR	R	X	SWR
1.8	50.5	0.8	1.02	52	0	1.0
3.5	50.6	1.3	1.03	52	0	1.0
7.0	50.8	2.5	1.05	51	0	1.0
10.1	51.1	3.6	1.08	52	0	1.0
14.0	51.5	4.8	1.10	52	0	1.0
18.1	52.1	6.1	1.13	54	0	1.0
21.0	52.6	7.0	1.16	55	0	1.0
24.9	53.4	8.1	1.18	56	0	1.0
28.0	54.1	8.9	1.21	57	0	1.1
30.0	54.5	9.5	1.22	58	0	1.1

lower values of SWR (closer to 50Ω) and deteriorating accuracy at higher values of SWR (impedances much higher or lower than 50Ω).

These results are quite good for an instrument of this type, but they have two notable features. One is that the reported SWR does not track as well as might be expected with the true SWR of the test load. This is a contrast with the MFJ-269 [2] and the AEA-CIA, each of which had some problems with the R-X measurements but always gave accurate SWR results. The other feature is the automatic display of the sign for the reactance. Simple bridge instruments cannot tell the sign of the reactance, so the usual technique is make an intelligent guess by changing the frequency slightly, and notice whether the reactance increases or decreases. With the manually tuned MFJ instruments, you have to change the frequency by hand, and then follow instructions in the handbook. The ZM-30 does this automatically under programme control, and was only fooled once in Table 1 (at 10.1MHz).

BALUN AND ADAPTERS

The ZM30-BT is a 1:1 balun adapter that allows the ZM-30 to be used for measuring balanced loads. This accessory comes with screw terminals on the balanced side, and a BNC socket to connect to the ZM-30 via a back-to-back adapter (also supplied). However, the result is mechanically rather floppy, and it highlights a question about the use of a BNC socket on the ZM-30. This right-angle socket is soldered directly into the main board, but this has several practical disadvantages. Since very few rigs or antennas actually use BNC connectors, almost everything else has to be connected to the ZM-30 through an adapter – including the ZM-30's own balun and calibration standards. Also, the BNC socket simply passes through a hole in the metal case, so it is grounded only on the main board and has no mechanical support where it enters the case. On an instrument intended for practical antenna work up to 30MHz, I'd much rather have seen an SO-239 socket, solidly secured to the case.

The performance of the ZM30-BT balun was tested in two ways: first with a 50Ω chip resistor load to measure its own SWR on a separate VNA; and then to see how accurately the ZM-30 itself measured the same combination. **Table 2** shows the results. The balun itself gave a truly excellent impedance match at lower frequencies, and creditable results even at 30MHz. The combination of the ZM-30 and the ZM30-BT reported reasonably accurate values of R and X at low frequencies, with accuracy reducing at higher frequencies because the X reading remained stuck at 0. Once again the SWR values were less accurate than the R and X values.

OTHER MODES

Capacitance and Inductance modes simply take the reactance (X) part of an impedance measurement, and then do the calculation $C=1/(2\pi fX_C)$ or $L = X_L/(2\pi f)$. Note that you effectively have to tell the instrument whether you're measuring a capacitor or an inductor, which is a common feature of instruments of this type.

VFO mode takes advantage of the crystal-controlled DDS to provide a clean signal on a precisely defined frequency of your choice. A separate mode is necessary because, in the normal Impedance mode, the DDS is regularly switching to another frequency to determine the sign of the reactance. On a good receiver, the DDS sounds very clean, even quite close to the carrier, and is free from microphonics when the case is knocked. This is a marked contrast to the free-running oscillators in some competing instruments. Suppression of spurious signals is about normal for a DDS (2nd harmonic better than -30dBc; all other harmonics and DDS spurs generally much lower). As with any crystal-controlled signal source, frequency accuracy depends on the on-board crystal oscillator; and as with any DDS, more filtering would be required before the signal could be used for a transmitter or receiver.

SOFTWARE UPGRADES AND RECALIBRATION

The big advantage of the ZM-30 over the MFJ-259B and -269 (its strongest competition) is the future-proofing facility for upgrading the instrument's operating software. Upgrades are downloadable onto your PC from the Palstar website, and can be installed through the ZM-30's 9-pin serial port. The only precaution is that you must follow the instructions carefully, and use the PC terminal software that Palstar provides on the website.

Since the ZM-30 is upgradeable, we can be more forgiving about a few rough edges in the calculations and operability in early releases of the instrument – these can be smoothed out later. However, one irritating feature that urgently needs an upgrade is that many functions cause a programme restart which resets the frequency to 10MHz. Even something as trivial as switching the audio tone on and off requires the operating frequency to be re-tuned. A high priority should be to store the instrument's previous state in non-volatile memory, so that the ZM-30 can always restart as the user left it.

Another advantage of the ZM-30 over the competition is the recalibration facility, which measures and stores the values of internal gain correction factors when the BNC socket is terminated in a succession of test loads. Recalibration is normally only required following software upgrades that relate to impedance measurement, and a set of test loads is supplied: a short-circuit, a 270Ω load and a 50Ω load. The procedure itself is very simple, because the display tells you exactly what to do at each step.

CONCLUSIONS

It is important to remember that professional vector network analysers cost tens of thousands of pounds, so we shouldn't expect lab-standard performance from an instrument in the £300 price class. The impedance measurement accuracy of the ZM-30 is adequate for almost all amateur applications, and could be made even better by programming changes and closer attention to the calibration standards. Aside from the rather unsuitable BNC socket, the ZM-30 is basically a soundly built piece of hardware, well able to take advantage of its facility for future software upgrading. The ZM-30 is currently priced at £299.95 from Nevada Radio, the importer which supplied the sample for review. ♦

REFERENCES

[1] http://www.amqrp.org/kits/micro908

[2] Equipment Review: MFJ-269, *RadCom* May 2000.

Ultimate Scanning Guide

By Richard Allport

Includes FREE Frequency Search CD

When the first edition of the 'Radio Today Ultimate Scanning Guide' first appeared in 2001 it set new standards in that expected from Scanning books. Not only did the directory claim to have a greater accuracy than other guides it also contained for the first time a searchable CD of the frequencies. Time has moved on and this edition of the book has many new features and touches. For those not familiar with Scanning directories this book provides a simple way to work out exactly who is broadcasting on a given frequency. The reader is provided with clear guidance as to what is available to listen to and what should be avoided. As with the previous edition the listings have been edited to ensure that defunct and duplicated entries have been deleted. This again makes the Radio Today 'Ultimate Scanning Guide' the most accurate and useable directory available. As before this book also contains a free searchable frequency CD. When this first appeared in the Radio Today 'Ultimate Scanning Guide' the CD caused a sensation and the new version is significant step forward. With an improved interface and lightening quick searching this is a boon to any scanning enthusiast. If you are a long standing scanning enthusiast or new to the hobby then you will find this book a "must have" for your book shelf and the yardstick by which every other book in this field is judged.

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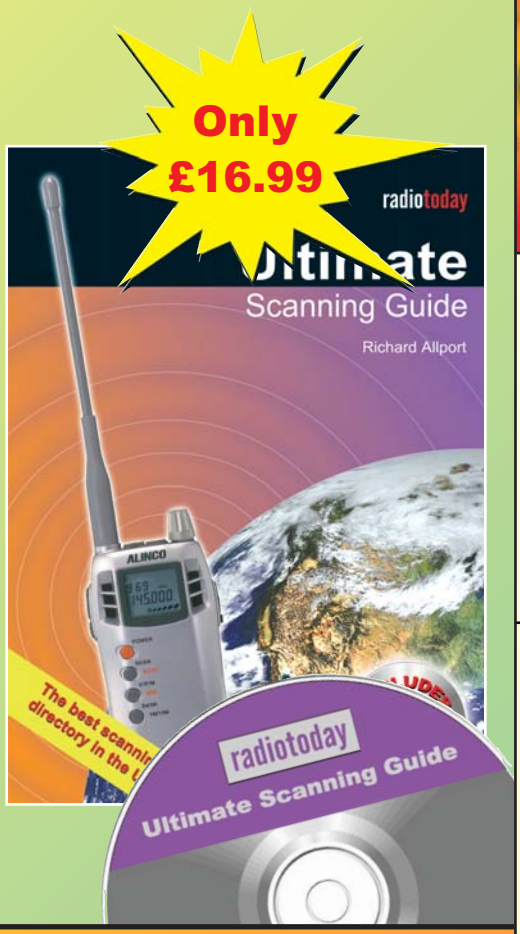

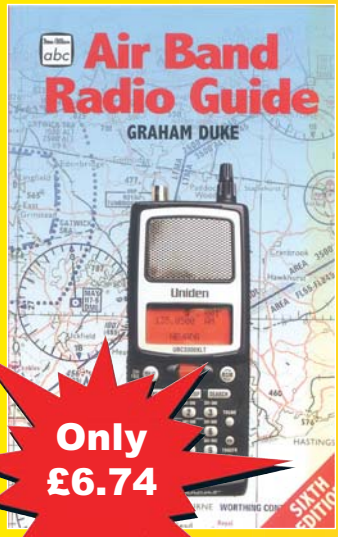

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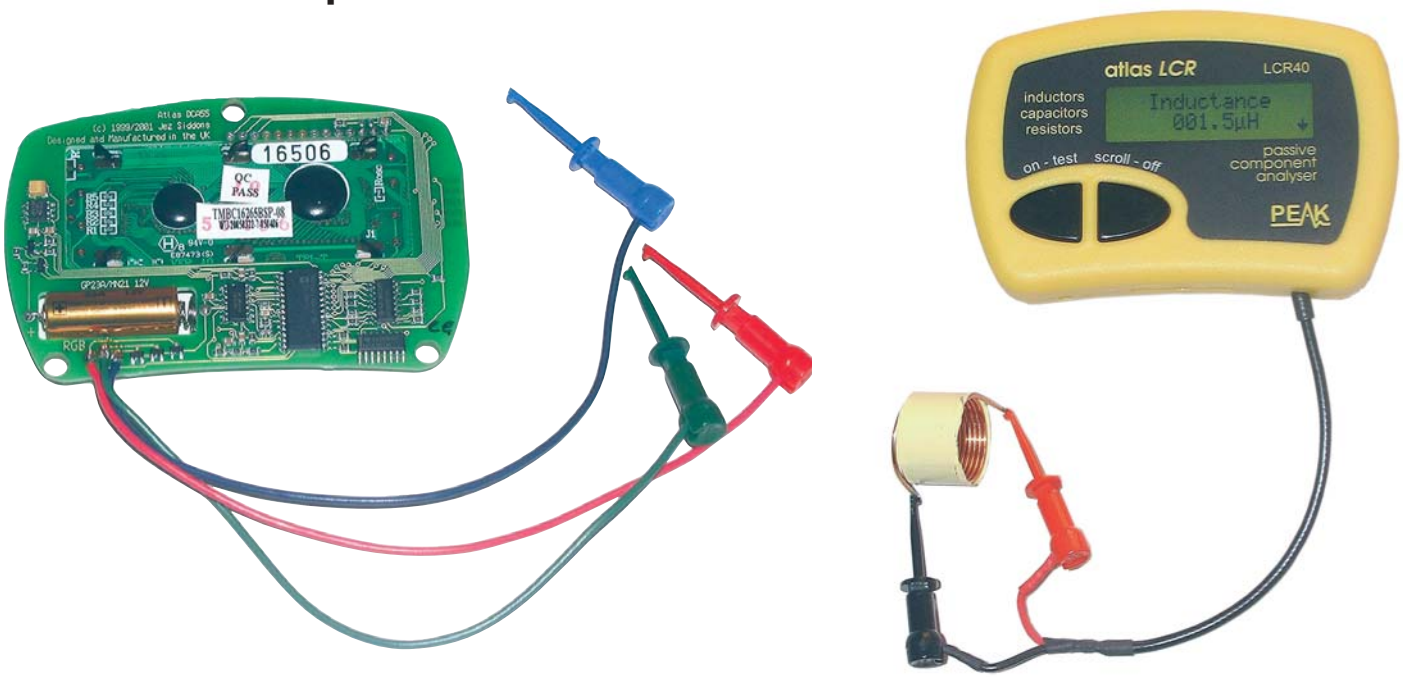
Peak Electronics Design's 'Atlas'

G4HCL tests the family of 'Atlas' analysers, and finds them more than equal to the task



When I was about 12 years old, I built myself a simple transistor tester, made out of bits I'd salvaged from a non-working transistor radio, together with a small meter I'd bought for a few pence from a friend. It proved invaluable in later years in testing the totally-unmarked active devices I subsequently bought by mail order in 'bumper bags' from surplus component dealers. As my interest in building radio circuits developed, I later built myself a small inductance bridge so that I could wind coils to the required inductance value, again finding this invaluable. Time passed by and I eventually found myself in a job actually designing two-way radio equipment, using rather larger and considerably more sophisticated (and heavy!) bench-top measurement equipment for inductance and so on. But how time has changed things!

When I first held one of the tiny range of Atlas component testers in my hand, I initially thought they would just be a digital type of what I built those many years ago. I was very, very wrong. These aren't just 'test' instruments, they're each a rather sophisticated analyser in a tiny case, yet each being very easy indeed to use.

Designed and produced by Peak Electronic Design Limited in Buxton, the range includes the 'Atlas LCR', which is a passive component analyser; the 'Atlas DCA', which is a semiconductor component analyser; the 'Atlas ESR', which is an equivalent series resistance meter, and the 'Atlas SCR', which is a thyristor and triac analyser. Each measures 103mm x 72mm x 20mm and is powered by a small internal 12V 'car key fob'-type battery. Various accessories including a protective carry case are available as options.

ATLAS LCR

As its three-letter title suggests, this measures inductance, capacitance and resistance in passive components. You just clip the two test leads to your component, press the 'On-Test' button, and within a few seconds the unit will have identified the type of component and its parameters for you, displaying these in sequence on the LCD. During its automatic analysis, it decides for itself whether to use direct voltage or an alternating voltage of either 1kHz, 15kHz or 200kHz, the display also telling you which has been used for the analysis. It'll measure inductance between 1µH and 10H, capacitance between 0.4pF and 10,000µF, and resistance between 1Ω and 2MΩ. If, say, an inductor has an associated resistance (for example, if it's a large inductance with plenty of turns) the analyser will, as well as giving you the inductance value, also display the DC resistance of the coil. Successive displays are shown when you press the 'scroll-off' button on the unit, the display cycling round until it reaches the first displayed value. Holding the 'scroll-off' button down for a second or so switches the unit off; alternatively, it'll automatically switch itself off after 20 seconds.

ATLAS DCA

This unit automatically identifies and measures the parameters of silicon and germanium transistors, Darlington transistors, MOSFETs, Junction FETs, low power thyristors and triacs, LEDs including dual-colour types, together with diodes and dual-diode networks. Three coloured test leads, blue, red and green, are used and you simply connect your semiconductor terminals to any of these leads. The unit then identifies what the semiconductor is, and which terminal (eg base, collector and emitter) is connected to which coloured test lead. It'll measure the transistor gain, MOSFET gate threshold, diode pn junction characteristics, semiconductor leakage current, base-emitter voltage and so on. Some recent transistors also contain other internal features, for example a protection diode across the collector and emitter (the Philips BU505DF is a typical example of one of these), or a resistor shunt across the base and emitter, or

analysers

two of these in the case of a Darlington pair. In these cases, the analyser is intelligent enough to also detect these and indicate the parameters on the display for you.

ATLAS ESR

If you've ever built an AC-to-DC power supply, perhaps either a 13.8V supply or a higher-voltage supply for valve linear amplifier use, you'll know the importance of a smoothing capacitor's Effective Series Resistance (ESR), as this is a good indicator of the capacitor's condition. It's usually rather difficult to measure, yet dedicated ESR meters are available from various sources, primarily aimed at the electronic repair sector. But, like the other analysers, the Atlas ESR meter goes one further, as it can measure capacitors in-circuit and can even compensate for the effects of other circuitry. It'll also automatically determine and allow for the capacitor polarity, so it doesn't matter which way round you connect the probes. Of course, many electrolytic capacitors retain a charge voltage after a significant time since power has been removed. With this in mind, the meter will identify this and automatically carry out a controlled voltage discharge of the capacitor before it starts measuring. The results show you the ESR with a resolution down to 0.01Ω and, if the capacitor is measured in isolation (ie out of circuit), it'll also display the measured capacitance value.

ATLAS SCR

Although the Atlas DCA will measure low power thyristors and triacs, the SCR goes further and can measure devices which require gate triggers from anywhere from a few tens of microamps right up to 90mA. Again, you simply connect your thyristor or triac any way round to the three test leads and press the 'On-test' button. The analyser will progressively increase the gate trigger in eight current steps from 100µA to 90mA until the device you're testing is triggered, using a load current of up to 100mA. The test currents are however only applied for a very short duration, typically less than 200µs, to minimise the possibility of damaging any sensitive semiconductors. Again it'll automatically detect which component terminal has been connected to which of the three coloured test leads, and will display the type of component identified and show the trigger current used.

PROBE COMPENSATION

Each of the analysers comes ready-supplied with clip-on test probes. Accessories such as SMD (Surface Mount Devices) tweezer probes and other probe types, such as long range grabbers, are available as options. Where required, for example in the LCR analyser and the ESR analyser, the unit can also be placed into a 'probe compensation' mode where it will run a short compensation procedure to ensure the probe's own inductance, capacitance and resistance is taken account for subsequent measurements.

IN USE

As well as being a bit of an experimenter during the review period, I was certainly able to make use of some of the units 'in anger' in helping me with some faultfinding work. Firstly, when a switched-mode power supply decided to die, I was around 90% sure that a given power switching FET was blown, although a replacement was rather expensive and difficult to obtain (it seems most such things are made in China nowadays, including the semiconductors!). The Atlas DCA confirmed this and I was, in fact, rather glad of this as I'd have been pretty annoyed if I'd gone to the trouble and expense of getting a replacement if the original had been OK! I'm also currently 'playing' with compact loop antennas, especially in configuring an automatic tuner for one. The Atlas LCR was a great help here in measuring the actual inductance of the various loops and of the high voltage 'doorknob' capacitors I'm using. In fact, simply using it together with a bit of RAE-style resonant formula maths saved me many hours worth of 'try it and see' experimental work.

Far left:
Inside the DCA.

Centre:
Measuring inductance.

Right:
Using SMD tweezers.

CONCLUSIONS

Overall I found the analysers extremely easy to use, as well as being very thorough and informative in their measurements. If feel the Atlas DCA and LCR would be a useful addition to the keen constructor or electronics experimenter's workshop, or even to add to an active radio club's equipment. These, as well as the SCR and ESR, would likewise be of value to those engaged in electronic equipment maintenance and repair.

The analysers are available direct from the manufacturers as well from distributors such as Maplin, Farnell, CPC, Rapid and RS. The current retail price of the Atlas LCR is £69, the Atlas DCA, £49, the Atlas SCR, £99 and the Atlas ESR, £79.

Our thanks go to Peak Electronic Design in Buxton (Tel: 01298 70012) for the loan of the units for this review. ♦

Book review

RSGB YEARBOOK 2006
Reviewed by RSGB Staff

The *RSGB Yearbook* is an essential publication for my bookshelf every year. We have come to expect the usual range of comprehensive updates and interesting features but in the 2006 edition there is even more than usual with the book running over more than 500 pages.

The *Yearbook* each year provides the only truly up-to-date database of UK and Ireland callsigns. In this edition the database is available in three forms. Calls are listed by surname and local town in addition to the traditional A-Z format. The book also contains a huge (192 pages) section packed full of useful information. This section is hugely useful and interesting to an amateur with just about every conceivable area covered - from band plans to contesting guides, repeater guides to lists of exam courses, operating techniques to awards.

The 2006 edition also provides informative features covering Summits on the Air and International Museums Weekend. This edition sees a huge new section – Featured Clubs – in which amateur radio clubs from Scotland to Cornwall are profiled. This section was provided to highlight the huge contribution that local clubs and societies have made to amateur radio. You'll be able to find out where the clubs meet, read about their history, what they do for members, how they encourage newcomers etc. Details of further clubs can be found on the accompanying DVD.

FREE DVD

In another first, the 2006 edition comes with a free DVD. This contains the movie 'RSGB Today' professionally produced for the Society earlier this year. In 'RSGB Today' you will meet the people behind *RadCom*, the general manager and the amateur radio department. You'll see an M3 licence course in Cheshire; HQ facilities such as the museum, library and GB3RS shack; the commercial department, the accounts department and the annual general meeting. But there's more than just the movie on the DVD. The DVD contains probably the most extensive information available on amateur radio clubs in the UK, including profiles, images, contacts etc. The DVD also contains a wide selection of amateur radio software. All in all, not bad for a "free" addition to the *Yearbook*.

The *RSGB Yearbook* is the essential book for the shack in the UK and the 2006 edition comes highly recommended.

By Steve White, G3ZVW
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CALLSEEKER 2006
Review by RSGB staff

Not only does this CD contain the entire printed *RSGB Yearbook* in electronic format, it provides callsigns from across Europe as well. In addition there is also a bunch of extras such as amateur radio freeware and Adobe Acrobat Reader 7.0. All this for less than a printed *RSGB Yearbook 2006*.

Callseeker uses the highly popular Eurocall interface that is so flexible and easy to use when searching for calls across the UK and Europe. You can search by call, name or address and get virtually instant answers to your query, with printing labels for your QSL cards just a click away. Callseeker requires no hard disc installation and runs direct from the CD with no fuss. The extra items on the CD are easily located using your Windows explorer or can be accessed from the "G" button on the Eurocall extras interface. The 192 pages of the *RSGB Yearbook* are supplied in PDF format, making it simple to search and find information using the supplied Acrobat software.

If you want something extra for less, then the *Callseeker 2006* fits the bill perfectly and is a useful addition to any amateur radio CD collection.

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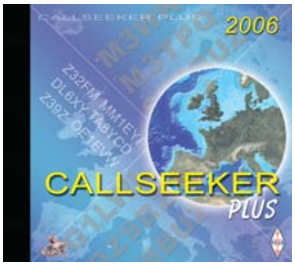

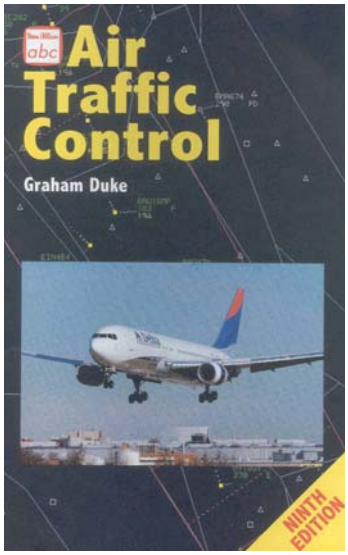

abc AIR TRAFFIC CONTROL (9th Edition)
By Graham Duke
Reviewed by RSGB Staff

Let me begin by saying that I'm not an aircraft-listening aficionado, so those who are please forgive this layman's account of what appears to be an excellent booklet.

First of all, I must explain that it is not a frequency listing, but an illustrated account of all the intricacies of air traffic control. It is a companion book to the *Air Band Radio Guide*, reviewed last month.

It begins with 'Airspace Essentials', explaining how the airspace of the UK is organised, and it includes some basic information about operational procedures. The Class A to Class G airspaces are explained, followed by brief descriptions of the regional control centres.

'Radiotelephony' covers all aspects of communication in the common ATC language (English). It is very comprehensive and explains the types of communication likely to be heard on casual and regular listening. Also covered are flight levels, altitude, height, pressure variations, QFE and QNH, and those parts of the Q-code relevant to ATC.

Chapter 3 is dedicated to the mid-air collision of a Tupolev Tu-154M and a Boeing 757 cargo plane over Überlingen, Germany, on 1 July 2002.

Chapter 4 covers airport procedures, with arrivals and departures, visual reference points, runways and holding patterns all receiving attention.

Later chapters cover the North Atlantic System and weather and airfield data. There are appendices and a glossary of aviation terms and useful addresses.

The book lifts the veil from much of what can be heard on the air bands, and may be thoroughly recommended.

abc AIR TRAFFIC CONTROL (9th Edition)
By Graham Duke
112 pages, 184 x 120mm, paperback
Ian Allan Publishing, 2005
ISBN: 0-7110-3074-9
Members' price £6.74
Non-members' price £8.99

All reviewed books are available from the RSGB Bookshop (www.rsgb.org.uk/shop). Prices exclude post and packaging.

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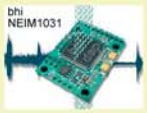

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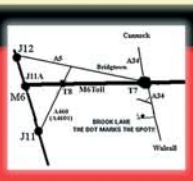

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One-Board-Filter

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.

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for the Yaesu FT-817, 857 & 897.

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

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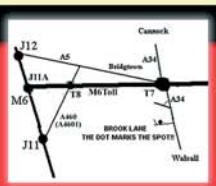

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Newcomers' news

Women newcomers do not receive enough coverage. Steve Hartley aims to rectify that

My mention of the Gloucester Amateur Radio & Electronics Club in the July column prompted an e-mail from the club treasurer, Anne Reed, 2E1GKY/M3GKY. I met Anne a few years ago when I did her Morse assessment. For those who are very new to the hobby, there was a time when an Intermediate Licence did not allow access to the high frequency bands without a Morse test. However, by doing a Foundation Morse assessment, holders could apply for an M3 callsign. Anne and I have exchanged e-mails from time to time since then and, following the July column, Anne suggested that there is not enough coverage of female newcomers. I agreed and asked her for her story.

"My interest in radio started way back in the early 1950s when I used to watch my grandparents tune their Cossor and Bush radios. After a period on CB and shortwave listening for a number of years I am now a licensed amateur, RSGB and ISWL member and treasurer of the Gloucester AR&E," said Anne.

"My favourite transceivers are the Yaesu FT290 and more recently the FT7800. Antennas in use include a 132ft long end fed with counterpoise for HF, a dual band vertical for 145 and 433MHz and a Chelcom vertical for 50MHz."

Anne looks forward to bank holiday Mondays when the Gloucester AR&E operates from Barrow Wake, Birdlip, four miles south west of Cheltenham. The views from this location stretch as far as the Black Mountains in Wales and due to the height above sea level some excellent results are obtained on the VHF/UHF bands.

Thanks for the input Anne, perhaps it might prompt other lady newcomers to write in with their experiences of amateur radio. How about it girls?

HELENSBUGH ARC HELP OUT

Earlier in the year, the Helensburgh Amateur Radio Club was asked to run a beginners' amateur radio course for the 49F (Greenock) Squadron of the Air Training Corps (ATC). The club agreed and set up a team of four to run the course; Barrie, GM0KZX, Bill, 2M0BIL, Jim, 2M0MGE and Carol, 2M0KND.

The 49F (Greenock) Air Training Corps with radio officer Brian Burt (see Helensburgh ARC Help Out)

The team started the training in February with the intention of holding the Foundation examination in May. Unfortunately, this clashed with the Scottish schools exam calendar so the radio communications exam was delayed for a few weeks. A good point for all instructors to bear in mind.

On 7 June, 13 ATC cadets and the squadron radio officer sat their exams. Eight passed and three of those who did not score enough to go home with a pass slip have booked re-sits. An official from the local Ofcom office visited the exams and whilst he was mainly there to see fair play he helped with the marking and provided lots of useful advice.

A room in the cadet hall has been set aside for a radio shack and the club is in the process of obtaining suitable equipment for the cadets to use. The squadron has been allocated the callsign MM0JET so listen out for them on Tuesday evenings between 19.00 and 21.00.

The Helensburgh ARC is intending to run another Foundation course later in the year with an Intermediate course running alongside it. The club is also hoping to offer Advanced training in the near future. The ATC meeting room in Greenock has been registered as an RSGB exam centre so Intermediate and/or Advanced candidates from the Renfrewshire area can be accommodated. Sounds like the club training team is going to be very busy. Good luck!

PMR CONVERSIONS

There has been some debate locally about the use of ex-PMR (Private Mobile Radio) transceivers by Foundation licence holders. The M3 licence does not allow holders to build their own transmitters or to convert ex-PMR equipment. That is fairly clear. However, the use of 'off the shelf' ex-PMR equipment is less clear.

I asked Alan Betts at Ofcom for an official explanation and he said that the issue was down to exactly what the formal declaration releasing the equipment on to the market says. If it is declared as PMR equipment, then even if it covers amateur frequencies, it is not amateur equipment and M3s must not use it. Any unauthorised modification will also invalidate the declaration.

If a company tests and formally redeclares ex-PMR equipment after modification for use on the amateur bands, the rigs cease to be PMR radios and become amateur radios. These would then be OK for the M3. The best advice for new or potentially modified equipment is to check the text of the declaration. It is normally printed in the handbook. Thanks for the clarification Alan. ♦

Jonathan Hare, G1EXG

1 The Copse, 50-52 Princess Road, Brighton BN23RH.

E-mail: jj.hare@ntlworld.com

A tube-Yagi for portable work on 144MHz

This cheap, compact and simple-to-construct five-element Yagi is ideal for low power backpack portable operation. The antenna elements pack up by sliding into the boom tube for easy storage. The antenna is light-weight and quick and easy to assemble in the field.

A 177cm length of 19mm diameter plastic waste water pipe was used as the boom for the tube-Yagi. This needs to be carefully marked and drilled to make sure the elements will be parallel when they are inserted.

Start off by drawing a straight line down the tube. There might be a seam on the tube that you can use, otherwise try laying it on a flat surface and run a marker pen alongside using the surface as a guide. Next, wrap a piece of paper around the tube and use the straight edge as a guide to mark an accurate circle around the tube where the elements will go. Then cut the paper to the length of the circumference and find the halfway mark. By aligning one end of the paper with the line, the middle point will act as a marker for the holes on the other side of the boom.

Don't try to drill through the whole boom in one go. Instead, drill the two holes separately. In this way you can correctly mark out, and then drill, the 10 holes on the boom that will take the five elements. You might need to open up the holes a tiny amount, but try to make the fit tight enough so that the elements slide in with a little friction.

The reflector and director elements are made from 3mm aluminium rod (welding rod or similar). An off-centre blob of epoxy resin (or small circular push-on metal clip) acts as a stop for the rods so that they will be correctly positioned when inserted. A label can be added (to tag each element clearly for easy identification in the field) to this side of the element so that you will never try to put the element in the wrong way. Once the rods have been fitted into the boom, a small rubber grommet is pushed on from the other side to fix the elements in place (see the photograph). Tube of 6mm diameter was used for the dipole element, and a few turns of tape were used on one side to locate this.

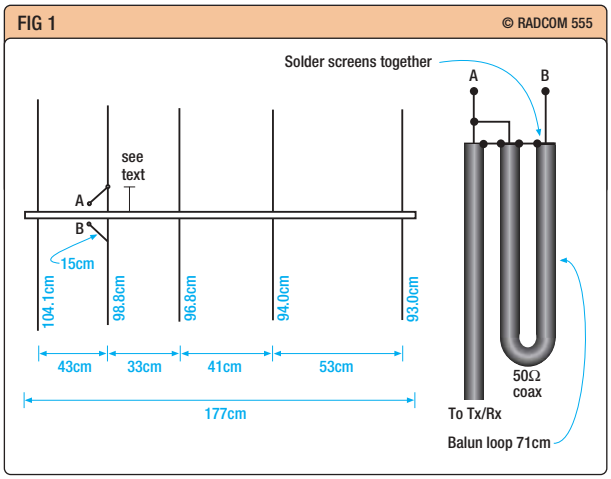

Fig 1
Schematic of the 5 element Yagi and balun (dimensions taken from the ARRL article, see 'Reference'.

The antenna is matched to the coaxial feeder using delta arms and a 4:1 coaxial balun to the dipole. The balun was constructed in the standard way (see **Fig 1**) using a loop of about 71cm. All the screens are soldered together at one point. The balun joints were covered in rubber solution glue to waterproof them and wired to solder tags to attach to the 15cm delta arms (which should be made of the same thickness tube as the dipole). The balun and delta arms were fixed to a sheet of plastic to provide support, as shown in the photograph. The other end of the delta arms were attached 11.5cm either side of the dipole centre using 3M bolts and butterfly nuts. (For a really quick and easy connection, I have successfully used large crocodile clips instead of bolts and butterfly nuts (see photograph). However, this is only really suitable for low powers).

To pack up the antenna, the elements of the Yagi slide into the plastic boom. Rubber bungs stop the ends – you now have a Yagi-in-a-tube. I also found that it was possible to slide the tube-Yagi within the centre of my portable telescopic mast so that only one item then needed to be carried besides the backpack.

SETTING UP AND ADJUSTING THE SWR

On unpacking, the elements are fixed to their correct places on the boom and the rubber grommets used to secure the parasitic elements in place. The delta arms attach via the bolts and butterfly nuts either side of the dipole centre. When using the beam for horizontal polarisation, let the balun hang down away from the plane of the Yagi and tape the cable to the mast as shown in the photograph. Adjustment of the SWR is possible by changing the lengths of the delta arms and where they attach either side of the dipole centre. I found that a good SWR was achieved over the whole of the band when the 15cm delta arms were attached 11.5cm either side of the dipole centre but some experimentation may be needed here depending what materials you decide to use.

Shown in **Fig 2** are typical measurements for the SWR of the beam mounted horizontally. I used about

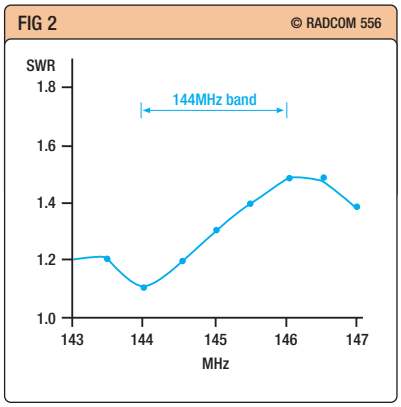

Fig 2
Typical SWR measurements for the tube-Yagi (horizontally mounted).

Top:
The 5-element Yagi unpacked from the tube and set-up on the portable mast.

Middle:
Detail showing the last director with its labelling, the position of the stop and the grommet used to secure the element

Bottom:
View of the balun and delta arms. The view shows the croc-clip connections around the dipole center used for initial testing, ideally these should be replaced with bolts and butterfly nuts.

7m of RG-58A/U coax for this beam; lower-loss cable will probably change the curve slightly. The Yagi delta match and the balun are both resonant devices, so two peaks in the SWR can occur if the two resonances don't coincide exactly. A good SWR over a part of the band is easy and, with experimentation, an SWR of less than 1.6 over the whole144MHz band is possible.

For vertical polarisation, it is best to use a non-conducting mast. There is no natural position for the delta match / balun in the vertical position. I tried them fixed along the boom (toward the first director) and also perpendicular to the beam and each gave slightly different SWR results, but I found the whole assembly still gave very usable SWR results over the whole band, even with a metal mast.

ANTENNA GAIN

The antenna gain of the Yagi was determined in a very simple manner. The GB3VHF beacon in Kent (JO01DH), roughly 60km distant from the test site (IO90WU) was used as a reference signal and received firstly on a dipole and then secondly on the 5-element Yagi (at the same height and with similar coax feeders).

A VHF RF attenuator (0 – 40dB in 1dB steps) was fitted between the antennas and the receiver. The S-meter was used to measure the signal at the dipole. When the Yagi was measured, the attenuator was adjusted until the S-meter read the same as that obtained using the dipole. The change in attenuation thus gave a guide to the Yagi gain compared to the dipole. These experiments gave a gain of 7 – 8dB with a front-to-back ratio of 10 – 11dB.

Note: I used about 7m of RG-58A/U coax for convenience, as it is much easier to pack away. However, less loss would be obtained using the more bulky RG-213, but it is a heaver load for the antenna to support and so some support tape for the cable needs to be provided.

FINAL COMMENTS

A standard TV / FM aerial mast clamp was used to attach the Yagi to the mast. It is worthwhile replacing the nuts on these clamps for (butterfly) wing nuts; using them is quicker and cuts down on the number of tools you need to carry when out-and-about on the hills.

The antenna is based on an old ARRL design [1] that I have used with excellent results over many years. The antenna seems to have a good combination of gain and bandwidth for its size. I have used the antenna singly, in twos and even in fours using a light weight open-wire phasing harness and universal stub, as described in the original article. Because the packed-up tube-Yagi is so compact and lightweight, it opens up the exciting possibility of being able to get further gain by using two (or perhaps even four!) of these antennas for backpack portable work. ♦

REFERENCES

[1] *The Radio Amateur's Handbook*, (ARRL), 1972, Chapter 22 – 'VHF and UHF antennas'.

PARTS LIST

1-off	plastic µpvc waste water pipe (eg 'osma 5') 19mm.
1-off	~1m, 6mm diameter aluminium tube (for dipole, see table).
4-off	~1.1m, 3mm diameter aluminium rod (for passive elements, see table).
2-off	rubber bungs (to fit the ends of the boom).
1-off	TV / FM antenna clamp & wing nuts.
	labels for element identification,
4-off	small rubber grommets & four cable ties.
2-off	solder tags and nuts & bolts.
2-off	3M bolts and butterfly nuts (or car battery size croc-clips, see text).
	50ohm coax (RG-58A/U convenient for portable use if short <10m lengths) and RF connector for radio.

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HF

A DXpedition to Kure Atoll in the Hawaiian Islands and increased activity from the only radio ham on Mount Athos in Greece are some of the highlights of Don Field's HF column.

Echoing my comments of last month, band conditions appear to have been dire recently, although some correspondents report that there was some good activity during the IARU contest. It was encouraging to see so many UK stations making the effort to work GB5HQ on multiple bands during that event. I was also challenged by a comment made on one of the reflectors immediately after the IOTA contest to the effect that most of the bands had been pretty busy during the contest, but seemed almost empty once it was over. Is it possible that when we complain of poor conditions it's sometimes just a case of everyone sitting on the sidelines watching the Cluster system for spots, rather than actually getting on the bands and making contacts?

DX NEWS

An experienced group led by Bob KK6EK will head for **Kure Atoll**, at the extreme north-western end of the Hawaiian Islands, from roughly 24 September to 8 October. The callsign will be K7C. Kure is currently #10 on the DX Magazine's most-wanted list, and #1 on the German DX Foundation's list. The team will be active with four stations on all bands/modes. In addition to the radio operations, the group has developed an innovative real-time interactive web-satellite-based system called DXA. This system enables DXers to see and interact with activities of the operation as they happen, using any web browser. This includes an almost real-time uploading of the logs and a system whereby DXers can "subscribe" and see exactly which band/mode slots they have worked at any given time.

A series of maps will also allow you to see which parts of the world the team is currently working. The group will be carrying out several scientific projects in collaboration with naturalists on the atoll to help restore and protect its fragile ecosystem. Finally, the group is developing an educational programme that will utilise the DXA resource to enable students to learn from and interact with the on-site team. The project is being supported by Icom and the Pacific DX Group (Kimo, KH7U, and Patrick, NH6UY). There will be designated "relay" stations around the world that will upload local recordings, photographs, etc to the web site – I will be undertaking that role for the UK.

Germany is now issuing DP and DQ calls. They are also now issuing 2-by-1 calls to club stations. In addition, the DP prefix is no long being used exclusively for extraterritorial areas. In the past, callsigns like DP0GVN and DP0POL were used in Antarctica. Now the prefix block DP3A-DP9Z will be club calls in Germany. The DP0-DP2 prefix will remain as extraterritorial areas. Currently there are no DI prefix callsigns.

It seems Monk Apollo, SV2ASP/A, the only amateur in **Mount Athos**, has been active lately on CW. Word has it that he is using a computer to send and receive CW. He has been reported on 160, 40, 30 and 15m.

Juergen, DJ3KR, will be in **Svalbard** from 3 to 20 September. His preferred frequencies are 1,823kHz, a few kHz up from the lower limits on the WARC bands, 3.5 and 7MHz, and about 14,020, 21,020 and 28,020kHz. Juergen will be working and teaching while in JW and that means ham radio will take second priority. This will be a CW-only operation.

Marcel, ON6UQ, and Roger, ON7TQ, will operate as HB0/homecalls from **Liechtenstein** from 17 to 24 September. They will operate SSB, CW, RTTY and SSTV on as many bands as they can, with an emphasis on the low bands. QSL via home calls, direct or bureau. Pictures of last year's operation can be found at ON6UQ's website.

EA5BYP and EA5YN hope to operate from 3C0, **Annobon Island** (Pagalu), as soon as they can make the arrangements. Elmo and Vicente operated on two previous 3C0 DXpeditions, 3C0R in 1999 and 3C0V in 2003. They say they already have their callsign and will announce it soon. They plan to operate 160-10, SSB, CW, RTTY and PSK31. Their web site is under construction.

Bruce, KK5DO reported that Dave, KA2HTV, would operate as P5/KA2HTV from **North Korea** during August. Too late for this column but hopefully some of you will have been able to snag this rare one.

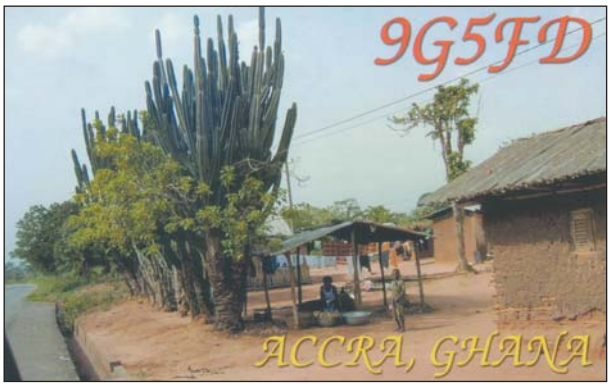
Vladimir, UA4WHX, has been in Sana'a, **Yemen**. He took the opportunity to speak with a number of officials responsible for issuing licences and for spectrum management, both in Yemen Telecom and the Ministry of Telecommunications and Information Technology. Vladimir says that he was told just one amateur licence had been issued in the past 20 years (to a Kuwaiti, though the operation never took place), and that amateur radio has never been put on a proper legal footing in Yemen. Even King Hussein of Jordan (well known as JY1) was denied a licence. However, Vladimir claims that there is an interest in Yemen in promoting the hobby and that there is a distinct possibility of an amateur radio licensing regime being put in place in the not too distant future.

Kardi, YB1TC, and others will be on **Karimata Island** (IOTA OC-NEW), from 1 to 5 September, CW, SSB and digital, 40-10, with 80 and 160 being considered. They are asking for the callsign YE7P. There will be a web site with further information.

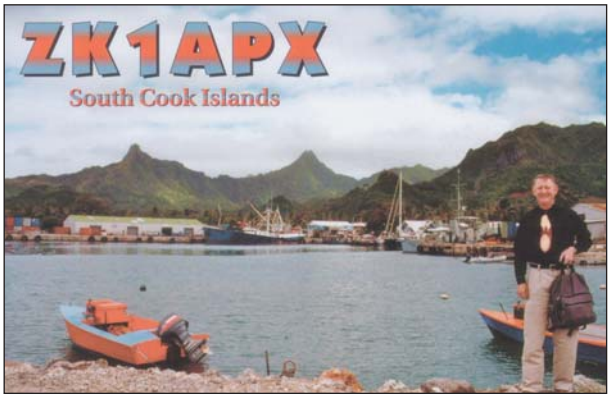
Several Italian amateurs from the Mediterranean DX Club hope to be active from **East Kiribati**, T32, in the 28 September to 15 October timeframe. Look for them to get on from two unnumbered IOTA groups, Flint Island, Vostok Island and Caroline Island.

Mike, K9AJ, and Bruce, KD6WW, plan to attempt to activate **Nunavut** (Kitimeot Region) West (NA-NEW) and West Central (NA-175) groups between 1 and 7 September. The exact dates for each group will depend on weather and solar conditions.

QSL card from Don, G3XTT's operation from Ghana earlier this year



QSL from AI5P's operation as ZK1APX (South Cook Islands) in April this year



By Don Field, G3XTT

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

E-mail: don@g3xtt.com

COUNTRIES WORKED, 2005
(starting 1/1/05, sorted this month by SSB totals)

CALL	CW	SSB	DATA	MIXED
G4PTJ	187	149	0	223
M5GUS	0	148	0	148
M0BKV	85	121	40	150
MM3AWD	101	119	56	127
G3JFS	154	117	140	183
G1VDP	0	117	0	117
GM0TGE	63	112	0	132
M0AWX	27	112	24	126
M3NCG	0	102	0	102
GM0EGI	140	101	0	179
G4WXZ	109	98	0	149
G1UGH	0	96	0	96
G0LGJ/M	0	95	0	95
GM4FAM	180	91	0	193
M3NCG	0	88	0	88
G4NXG/M	0	83	0	83
G4FVK	69	80	0	98
MU0FAL	111	78	0	125
M5LRO	24	78	7	100
G3YVH	85	71	0	124
G0RTN	155	67	0	167
G3LHJ	141	60	80	153
G4OBK	167	59	78	180
MM0BQI	51	57	79	108
M0CNP	7	42	68	84
G4WFQ	163	40	60	181
G4RQI	94	40	0	94
G6CSY	0	37	59	63
G7CLY	0	34	0	34
G4DDL	66	33	7	70
G6HOU	0	32	46	62
G3YJQ	94	26	91	126
G3TBK	149	24	10	152
GM8OEG	45	8	36	56
G0KBL	197	0	0	197
G4KFT	177	0	0	177
G3HQT	140	0	0	140
G3YMC (qrp)	140	0	0	140
M0BVE	107	0	0	107
GU0SUP	0	0	102	102
G3WP	82	0	0	82
G4IDL	80	0	0	80

Dave, AH6HY/W3, will be on **Smith Island**, NA-140 from 16 to 18 September and as AH6HY/W4 will be on **Tangier island**, NA-083 from 12 to 21 September, SSB only, 20 through 10. QSL via his home call.

AWARDS NEWS

The Associazione Radioamatori Italiani (ARI) Regional Council of Piemonte and Valle d'Aosta is pleased to introduce the "Torino 2006 Award" celebrating the "XX Olympic Winter Games" that will take place in Torino, Italy, in February 2006. Full details can be found on the ARI Torino 2006 web page.

Mike, VE3VHB, notes that HB9BZA publishes a partial list of Logbook of the World users (see WWW for the URL). When I checked it, there were just over 5,400 users listed. Of these, by far the majority are US amateurs, just short of 3,000. There were almost 200 UK users, quite a lot higher than for most European countries. And there were about 285 DXCC entities represented altogether, quite an impressive total, given that many historical logs will never be converted from paper and uploaded.

9 BAND TABLES No 55

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	320	292	334	321	333	304	314	2741
GW3JXN	201	268	303	297	329	322	324	300	305	2649
G4OBK	205	244	295	303	330	314	321	308	303	2623
G3SED	244	275	303	297	320	302	307	281	291	2620
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	123	218	273	282	323	311	320	303	303	2456
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
GM3PPE	148	212	258	280	320	271	282	248	229	2248
G3AKU	116	175	247	258	303	271	278	268	276	2192
G5LP	76	234	288	238	312	254	288	196	258	2144
G3VKW	50	176	244	154	329	253	325	266	310	2107
G4WFQ	55	179	238	224	265	230	240	186	204	1821
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	298	241	293	204	255	1533
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	115	66	193	109	198	87	177	1071
2E1RDX	41	52	104	42	195	129	202	132	91	988
M0CNP	11	59	92	16	173	110	163	80	125	829
MM3AWD	1	33	113	11	198	97	126	56	0	635
M5AEF	1	24	28	7	69	92	72	30	40	363
AVERAGE	**103**	**169**	**225**	**194**	**280**	**239**	**273**	**221**	**243**	**1947**

CW ONLY

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
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	292	314	306	311	286	290	2598
G3TXF	145	246	305	306	324	307	322	290	298	2543
GW3JXN	198	251	290	297	316	308	313	280	280	2533
G4OBK	197	229	287	302	316	305	301	291	288	2516
GM3POI	225	256	300	291	314	282	293	254	265	2480
G3SED	243	263	298	297	294	277	279	243	234	2428
G3YVH	148	184	265	295	317	302	301	266	272	2350
G3SXW	99	211	268	277	319	292	304	265	287	2322
G3LAS	122	163	254	282	287	292	292	268	269	2229
G3AKU	116	175	247	258	294	263	268	253	259	2133
G5LP	76	230	287	238	303	254	279	195	251	2113
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	175	232	222	211	198	187	154	133	1565
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**	**173**	**240**	**237**	**270**	**244**	**263**	**223**	**233**	**1998**

INTERNATIONAL REPLY COUPONS

Ken, ZL4HU, advises that the New Zealand Post will no longer accept the old style IRCs. They will now only accept the larger type with the bar code on the reverse side. Readers might also have noticed that the new-style IRCs, unlike the previous versions, do have an explicit expiry date of 31 December 2006, so there is less scope for them to circulate for years within the amateur radio community as has been the case in the past. Phil, G3SWH, took up some of these issues with Royal Mail to see what its policy was. It looks as though the Royal Mail is taking the view that all IRCs currently in circulation, including the previous types, will be deemed to expire at the end of 2006. The organisation has yet to be advised by the Universal Postal Union as to when a new series of the new-style IRCs will be issued, presumably with an expiry date of the end of 2007.

DX CLUSTER

Rod Elliott, VE3UW, has collected the DX spots from the OH2AQ Web Cluster since January 1997. The collection -

from January 1997 to June 2005 - is available from the 425 DX News web site, along with the software (DXINFO v2.0) to enable you to handle the files.

SILENT KEY

Rick, NE8Z/HC1MD/HC5EE, reports that Alfonso "Alfo" Villavicensio, HC5AI, became a Silent Key on 13 July. Alfo was 78 years old and was quite ill for the last 2 years. Alfo was an active CW operator for 65 years and will be in many readers' logs.

CORRESPONDENCE AND TABLES

Mike, G4DDL, comments on the recent poor conditions, but had some fun in the IOTA contest, with VY2TT the outstanding signal at his QTH. Mike will be on as F/G4DDL/P from 4 to 10 September. Alan, G3YVH, reports working CY9SS (St Paul Island) on 80 and 160, for a couple of nice ones. Derrick, G3LHJ, also reports working CY9SS (no band mentioned) and enjoyed chasing the 4X17 special event stations from Israel. Welcome this month to Mark, M3NCG (2E0NCG). Under his M3 call, he worked 8P9AM and CY9SS on 20. His 2E0 call still seems to be a draw (a rare prefix), and he had two BG (China) stations, two JAs and two VUs answer CQ calls. Can't be bad. Mark likes working portable from the beach, using wet sand as an earth and says that "having a simple ? wave vertical with no radials is a very, very good way of working DX!" Well Mark, there's nothing like being right next to seawater to help your signals on their way.

Fred, G3YJQ, reports for the first time this year and mentions CY9SS, 9M6/G3OOK, VR2XLN, 9M2CNL, 9V1V, YB2ECG, WB9CIF/J6, JT1CO, HR1RMG, TI8CBT and 4S7AB, all on RTTY. Ken, G4YRF, writes to remind me that, as well as being accessible via the Internet, the 425DX News continues to be available via packet. Brian, G3GJX, says those who complained about the Rockall operation should look at the photos on the expedition website!

Terry, G1UGH, reports CY9SS on 17 and S9SS on 15 for new countries. Other contacts included AY8A (special Argentinean prefix) on 15 and 9K9HQ on 20. Peter, G3HQT, has been frustrated by poor propagation and high summer static levels. His only QSOs of interest were A61M on 20, C6AIE on 30, VP5/K7LAZ, VP9HW, XE1GSQ and HF0POL (South Shetland) on 40. Damian, M0BKV, worked 9M2CNC (Richard G4ZFE), CY9SS A71A on 20, YI9HU 3DA0TM on 15 (these on SSB) plus KH6J and KH6RS (Hawaii), UK/JI2MED and plenty of JA stations (in the All Asia contest) on 20 CW.

Chris, M5LRO, sends in a first report, having just reached 100 countries. He is particularly interested in 17m, where he is using a homebrew 2-element delta loop. The band has given him good contacts into Australia and South America, plus 8P6GU, PJ2MI, CY9SS, ZF2AH, TI8CBT, FG5GP, TZ9A, 6Y5GC, EX8AA, FM5AN, J68ID, CO8LY, PZ5RA and others.

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 **November** issue by **20 August**. ♦

WEB SEARCH

3C0	http://www.tabarca.es.mn
ARI Torino 2006	www.ari-r1.it/torino2006
DX Spots archive	www.425dxn.org/dxspots/
K7C	www.cordell.org/htdocs/KURE/index.html
LoTW users	http://rchalmas.users.ch/lotw/
ON6UQ	http://users.pandora.be/ON6UQ
YE7P	www.orari.web.id

HF F-Layer, Propagation Predictions for September 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	97.....7889	68511.269988	..73556898..	..4778888...	....88.....	.....	.....	.....
*** ASIA								
Yakutsk	.........1..	4664	..422256765.	..3667.....	....5.....	.....	.....	.....
Tokyo	........23..	.......5771.	.....23555..	....232.....	.....2.....	.....	.....	.....
Singapore	.........121.	68833	......3887..	.....6774..	.....2565...	......23....	.....	.....
Hyderabad	122	1.....16776	178875	.....167....	..36678.....	...4567.....	.....	.....
Tel Aviv	88.....7888	976....69988	8.87337999..	...777789...	....34.....	.....	.....	.....
*** OCEANIA								
Wellington	........2...	......268...	...245656...	...4454.....	.....	.....	.....	.....
Well (NZ) (LP)	..1.....	.38.....	348......221	..6......43.	.....	.....	.....	.....
Perth	.....	.......2653.	.......352..	.....	.....2.....	.....	.....	.....
Sydney	.....	.......565..	......2543..	......22....	....2.....	.....	.....	.....
Melbourne (LP)	.....	...3.....	...5.....	...2.....	.....	.....	.....	.....
Honolulu	.....	..31.....	..3642.....	...22.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....1...	.....6...	.....5...	.....4...	.....3...	.....
W. Samoa	.....	..1.....	..35664.....	...3665.....	.....3.....	.....	.....	.....
*** AFRICA								
Mauritius	1.....221	5.....17875	1.....68862	.....786..	.....66...	.....44...	.....	.....
Johannesburg	78.....1888	79.....9999	.7.....39996	..52..38997.	..24335787..	...3345775..	...667788...	.....
Ibadan	35.....123	876.....3788	7.93...18987	..98436798..	...9888998..	...966699...	.....99...	.....
Nairobi	2.....1	75.....5666	77.....17777	..51...67774	..76556887..	..3766788...	...344566...	.....
Canary Isles	888.....888	9995...17999	86874236 8998	...85446996.	...8888899..	....777797..	.....6...	.....
*** S. AMERICA								
Buenos Aires	656.....3	8881.....78	5251.....265	.....63.	....532268..	....532367..	.....5...	.....
Rio de Janeiro	212.....2	656.....476	314.....763	.....72.	....644578..	....554578..	.....3336...	.....
Lima	1.....	5231.....24	1..3.....32	.....	.....42246..	.....32.44..	.....	.....
Caracas	11.....1	6661.....36	6.25.....66	....3....54.	....232246..	.....32..	.....	.....
*** N. AMERICA								
Guatemala	111.....	4333.....3	...3.....1	.....	.....	.....	.....	.....
New Orleans	22.....	6661.....5	2.....23	.....2..	.....47676..	.....4.5...	.....	.....
Washington	665.....3	8882.....38	5...2....278	.....544675.	.....57777..	.....4.5...	.....	.....
Quebec	886.....8	8686.....78	....2....36.	.....433563.	.....68.87..	.....	.....	.....
Anchorage	.....	5651.....12	..2.....13.	.....2..	.....	.....	.....	.....
Vancouver	.1.....	132.....	.....	.....	.....	.....	.....	.....
San Francisco	.....	.22.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....42...	.....42...	.....33...	.....

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 July 2005 issued by the Sunspot Data Centre, Brussels, was 39.9. The daily maximum / minimum numbers were 107 on 4 July, and 0 on 18/20/21 July respectively. The predicted smoothed sunspot numbers for September, October and November are respectively: (SIDC classical method - Waldmeier's standard) 27, 26, 25 (combined method) 26, 25, 23. 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.

Roger Balister, G3KMA

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E-mail: g3kma@dsl.pipex.com

IOTA

QSLing – the success or failure in getting cards, the delay in receiving them and the cost of sending direct – is a conversation topic at any gathering of Islands on the Air enthusiasts. Since IOTA awards require the submission of QSLs, IOTA management is keen to see arrangements in place for those who want cards to get them.

Many stations have an exemplary record in handling cards, others less so. When particularly keen on receiving a card, many operators prefer to send direct, enclosing a self-addressed envelope and return postage as an alternative to using the QSL bureau system. But the cost has increased significantly. The single green stamp (dollar bill), the stalwart of days gone by, is no longer sufficient to meet postage costs back to the UK from most countries outside Europe. This has led increasingly to requests for two dollars for a return card, an amount that tends to over-compensate for costs. Use of a single international reply coupon (IRC) might be a cheaper option but this can be insufficient if the weight limit specified in the country concerned is exceeded; hence requests sometimes for two IRCs.

The bureau is of course a cheaper alternative. But quite a few island stations, not exclusively expeditioners, insist on direct QSLing. The cost of handling bureau cards in significant volumes can be quite substantial given QSL printing, purchase of computer consumables and bulk-mailing to a bureau, and there is no guarantee that the bureau won't levy an additional charge. Undoubtedly, some expeditioners feel that the community of stations that work them should contribute to these costs and at the same time not waste their time by making unnecessary requests for cards not really needed.

The direct only QSL policy attaches a price to a QSL card and separates those who are prepared to pay from those who aren't or can't. From IOTA's point of view, this is a significant barrier to participation in the programme. For the expeditioner, it means that a much lower proportion of his contacts will ever have cards submitted for IOTA credit. Is this really what he wants? One has only to listen to IOTA pile-ups to realise that most people calling have never submitted an application – the cost of direct QSLing may be one of the main reasons for this.

Are people adopting a direct only QSL policy without first checking the options for reducing the costs of bureau QSLing? For example, in respect of printing, are double-sided multi-colour cards, let alone four sided ones, really necessary? They may be appreciated by the folk applying direct with adequate or more than adequate postage but, for bureau applicants, cards of a more basic design and colour come cheaper, weigh less and confirm the contact just as well. If economies here are not enough to change policy, and if your operation is from one of the rarer IOTA groups, then look seriously at the possibility of appointing a QSL manager. There are volunteers willing to handle bureau cards for you at little or no cost. Advertise your need in one of the DX bulletins.

It's not a black and white issue. It's a matter of personal choice and circumstances vary. Many operators live in countries where there is a limited or non-existent bureau service. Even in countries where there is one that is well-developed and effective, there can be a ban sometimes on using it for out-of-country operations, particularly by a third party operator, unless an extra charge, often an additional membership subscription, is paid.

The IOTA committee supports the policy on QSLing adopted by IARU Region 1 that QSL cards received direct with adequate return postage should be replied to direct and those received via the bureau should be answered the same way.

If the planned inclusion of IOTA in the ARRL's Logbook of the World system goes ahead, it would enable applicants to obtain IOTA credits without the need to submit cards. More on this later. ♦

A reminder. If you are going to the RSGB HF convention in October, take your IOTA application or record update along. There will be a collection point for cards and a promise of safe forwarding by hand to the UK checkpoints. If you submit your application this way, the IOTA committee will pay the cost of returning the cards to you by normal post afterwards. Please make sure that the application is complete and accompanied by correct administration and certificate fees. Don't leave it too late, start preparing now. There will be no IOTA card-checking at the convention. For a brief note on how to go about applying for an award, see the IOTA column in the March 2005 RadCom (p58).

WEB SEARCH

RSGB IOTA Programme	www.rsgbiota.org
IOTA Manager's website	www.g3kma.dsl.pipex.com
IREF	www.islandradio.org

Bob Treacher, BRS32525

93 Elibank Road, Eltham, London SE9 1QJ

Email: brs32525@compuserve.com

How does an amateur QSL an SWL report?

Bob explains the 'rules' whereby an amateur can give *useful* QSL information to a short-wave listener in return for an SWL report. Not all amateurs send QSL cards that are valid for awards, so here's your chance to find out all about it!

I covered basic SWL QSLing last time. Several comments were received – mostly from licensed amateurs who wanted to know how to QSL an SWL report. The theme was one of wanting to encourage listeners by replying to SWL reports – even if they were not terribly useful – so that they continued their listening in the hope that one day they would decide to become a licensed radio amateur.

For the purposes of explaining how to go about QSLing an SWL report, I shall assume that most licensed amateurs use 'sample' cards, ie use their own design for the front of the card, but use a standard design for the 'business' side. On this basis, you will probably have a layout featuring the standard six-box design which allows space for callsign worked, date, time, band, mode and RST report. Marginal changes are required if you are QSLing an SWL report.

In the 'confirming QSO' box, change 'QSO' to 'SWL report' and write the SWL's callsign. Insert the date. Use UTC or GMT for the time. Write the band (or frequency). In the 'Mode' box say 'One-way SSB' (or CW). Clearly, you do not put a report in the RST box! Instead, you can either just draw a line, you can write 'Tnx' (thanking the SWL for his report), or you can write the callsign of the station you were working. Even if you do not quote the station being worked in that box, it is important for award purposes that the callsign of the station you worked is included somewhere on your reply to the SWL report. You can, of course, add any other personal comment you wish, eg hoping the SWL pursues the hobby and goes on to get a callsign, etc.

It goes without saying that you should only reply to the report if the details match your log book. I have handled many SWL cards (as QSL Manager for at least half a dozen big DXpeditions and special event stations) and can testify that SWL reports are not as accurate now as they were five years ago. If the SWL card comes via the bureau, reply the same way. If it comes through the post with sufficient return postage, then reply direct. Some SWLs have the annoying habit of sending cards direct but not enclosing any or sufficient postage. It will obviously be for each individual to decide how he responds – either direct but with a comment that the SWLs rate of return will improve if he includes the correct postage! (or similar comment), or return it via the bureau.

I am well aware that many licensed amateurs now use labels prepared by a logging program (eg *XM Log*, *DX4Win*, etc). All the above 'rules' apply. The important one is that the 'station worked' must be shown as some SWL awards do not accept cards where that information is not provided – most computer-program-generated labels do not provide that information.

In case clarification is still needed, check the photograph of the label I have used as SWL QSL Manager.

To SWL: _____

D68C confirms SWL report:

Date	UTC	Band	Mode	Stn Wkd

Tnx for report.....Bob BRS32525

Above:
One of the many colourful SWL cards received from JA for the D68C DXpedition.

Left:
A label I have used as SWL QSL Manager.

BAND REPORTS

I cannot say that band conditions have been at their best over the past couple of months. Indeed, at this time of year (July), the bands are always in the doldrums – this year they just seem worse! However, for those who know the bands and propagation trends, there is DX to be heard. There has also been as great deal of short-skip (Sporadic-E) propagation on 28 and 24MHz over the past few weeks. I hope that SWLs have taken advantage of these conditions to log some of the European countries that might have been missing. It can actually be quite rewarding monitoring 24MHz to hear a station from T9 or TK. It's almost the same feeling as hearing some rarer DX on 14MHz! By the time you read this column, the Sporadic E season will just about be over, but it might be worth having a final check of those bands to see if there is short skip propagation.

I used to feature VHF SWLing in this column quite regularly during summer months, but not recently. This year, there has been some quite good double-hop Sporadic E conditions on 6m (and 2m). Of course, perhaps the 6m listeners are waiting for the return of F2 conditions – you will have a few more years to wait, I'm afraid! This year, some good DX has been heard – 5T5, CT3, TT8, TA and 4X to mention a few. Perhaps there will be more VHF SWL interest next year.

Robert Small, BRS8841, and Philip Davies, RS95258, provide this month's report. Robert comments on not logging a single station on 21MHz, with the LF bands not much better – only S9 and KP4 of any note on 7MHz. Robert's only new one this time was ST2VB on 10MHz CW. Other DX heard on that band included CO2NB, V44CO, XT2JZ and 9G5FD. 14MHz was the best band for DX, but most of it was heard during early morning and late evening hours. Callsigns noted on that band included 7Q7AM, 9M2FB, CN8SG, 5X1RI, V25TA, HZ1ZH, 9Y4/RA3AUU, J48SI, 9M2KMA, JW8WF, TA3J/4, CY9SS, TI8CBT, CO3CJ, KH6YY, A71EM, 4K8M, 6W7FZ and 4M5DX. Philip mentions 18MHz where he logged A6/ON5NT and 5U7JB.

INTERNATIONAL LIGHTHOUSE/LIGHTSHIP WEEKEND

This popular weekend will probably just have passed when you are reading this column. However, any SWL who monitored the 20/21 August weekend will find QTH and QSL information at **http://illw.net/2005_list.htm** ♦

2005 HEARD TABLE

SWL	160m	80m	40m	30m	20m	17m	15m	12m	10m	TOTAL
BRS32525	36	38	64	0	121	10	77	16	27	389
BRS8841	29	44	67	15	59	30	57	11	22	334
RS95258	46	63	57	0	66	11	63	0	0	306

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Cobra 17	18.068-18.168MHz	2kW	90cm long	(500W RTTY/CW).....£105.00
Cobra 20	13.8-14.8MHz	2kW	90cm long	(500W RTTY/AM) £105.00
Cobra 30	9.9-10.3MHz	2kW	93cm long	(500W RTTY/AM) £105.00
Cobra 40	7-7.2MHz	2kW	93cm long	(500W RTTY/AM) £105.00
Venus 80	3.5-3.8MHz	2kW	248cm long	(500W RTTY/AM) £179.00
Venus 155	1.913-1.933MHz	2kW	248cm long	(500W RTTY/AM) £179.00
Venus 160	1.830-1.850MHz	2kW	248cm long	(500W RTTY/AM) £179.00

Delivery: Cobra £20, Venus £25. (England & Wales, phone for other destinations)

Tigertronics Sound Card - Radio Interface

For all available Digital modes, the SignaLink SL-1+ also supports the latest Voice modes such as Internet Repeater Linking (EchoLink, VOIP, etc.), Remote Base, and Voice Keyer operation. We sell four versions of the enhanced model the SL-1+8R with 8-pin round mic. connector, the SL-1+RJ45 with RJ-45 mic. connector, the SL-1+RJ11 with RJ-11 mic. connector and the SL-1+6PMD with 6-pin mini Din Data Port connector SL-1+8xxx Interface with rig lead (you specify! **£69.95**

Extra leads

£14.95
(8-Pin, RJ-45, RJ-11, 6-pin mini DIN)

£19.95
(SL-CAB-13I 13-Pin Icom), (SL-CAB-13K 13 Pin Kenwood)

At last Digital SSB audio has arrived.

(At a sensible price too!)

Hearing is Believing!

SSB has been around since the fifties. Imagine super low noise-free communication using your existing transceiver on SSB. Just plug-in and go!

Until the "big three" finally install digital voice in their products (its only a matter of time) you can use the system right now. See web for details and ordering info.

AOR ARD9000 Digital Voice Modem

Only £169

incl VAT. P&P £10

- NO transceiver modifications necessary
- Digital voice communications using existing analog transceivers
- Amazing Audio Quality
- Works on Single Side Band (SSB) mode
- Automatic digital receive
- Optional interface cables for most popular transceivers
- Built-in high grade Vocoder (AMBE)
- Built-in FEC error correction
- Compact unit. Easy to operate.
- Utilizes a uniquely designed high performance DSP engine
- Uses the established G4GUO open protocol

Hustler 6-BTV Only £229.95

The best performing H.F. Vertical - ever!

We have literally sold hundreds of these with fantastic customer reports. At last a vertical that gives you REAL PERFORMANCE on 80m and 40m, as well as the other bands. No radials required. Just mount 18 inches above the ground, connect to a decent earth spike close by and operate.

6-BTV HUSTLER 80-10m Vertical 1kW.

6 Bands: 10, 15, 20, 30, 40, 80m. VSWR 1.6:1 or better. 10-40m Bandwidth up to 100kHz 80m. Power: 1kW

If you can't mount the Hustler 6-BTV on the ground then the only choice is the new VK5Jnr. It's so good we use one at our new H.Q.!

MyDEL MultiTrap

Forget the G5RV. Install a proper TRAPPED wire dipole MutiTrap for 80-10M. Only 66'. Must be centre supported. **£99.95**

MyDEL MegaTrap

Same as Multitrap but 160m/80/40m, 105' long .

£109.95

NCS Multi Switcher

New Low Price! £239.95

The NCS Multi-Switcher is a "mini-console" that lets you switch all operator equipment (microphone, headset, keyer, foot-switch, etc) to any of four radios at the push of a button. You can switch between a headset, desk or hand mic, TNC, Phone Patch, Sound Card, etc. The Multi-Switcher matches the impedance, audio level and pin-out of nearly any microphone to virtually any radio including vintage rigs. The Multi-Switcher also switches your foot- or hand-switch and CW keyer to the selected radio.

Connecting cable for any Yaesu, Icom or Kenwood Radio £19.95 each

For more details and the complete range of NCS products see our web site.

Daiwa Meters

Daiwa CN-101L: SWR/PWR Meter 1.8-150Mhz
Power range: 15/150/1.5kW ..... ML&S only £59.95

Daiwa CN-103LN: SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... ML&S only £65.95

Daiwa CN-801H: SWR/PWR Meter 1.8-200Mhz
Power range: 20/200/2000W ..... ML&S only £109.95

Daiwa CN-801V SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... ML&S only £119.95

Daiwa CN-801S SWR/Power Meter 0.9-2.5Ghz
Power rating: 2/20 watts..... ML&S only £139.95

Probably the best RF measuring device for your shack!

MyDEL Power Supplies

A new rage of PSU's from MyDEL. The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8V DC at up to 25 Amps.

MyDEL MP-250A

25 Amps maximum, 22Amps constant, ideal for most modern HF Transceivers

- Variable Voltage 9-13.8VDC
- 110-234V input
- 2 x outputs: 25A Binding Posts, 7A Cigar Socket
- Fan cooled, speed variable to voltage supplied
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- Only 5 3/4"W x 4 1/2" H x 6" D in size
- Less than 35mV peak-to-peak ripple under full 25AMP load
- Full exchange warranty for 2 Years

Only £89.99 incl VAT!

MyDEL MP-4128

Another new switch mode PSU from MyDEL. Similar in spec to the MP-250A but without meters or cigar lighter o/p. 22-25 AMP output with heavy duty binding posts on the front panel and push on terminals for lower current output on rear. Fully protected.

£69.99

Yaesu FP-1030A

A power supply for Life? Probably.

25-30 Amp power supply **£179.00**

FJ, Miracle Antenna, Oregon Scientific, Revex, Tokyo-Hypower, Watson, Diamond, Yaesu and many more!

Tim Kirby, G4VXE

Willowside, Bow Bank, Longworth, OX13 5ER

E-mail: tim@g4vxe.com

Contest

The latest news from the highly competitive world of amateur radio contests. Tim Kirby reports.

IARU CHAMPIONSHIP – GB5HQ

Congratulations to the operators and support team who ran GB5HQ from various sites around the United Kingdom during the IARU HF Championship in July. The conditions were poor, but the team amassed well over 12,000 QSOs in the 24 hour period, including around 3,000 contacts from the UK. To challenge the German and Polish teams, big scores are needed and a good level of support from the home country can make a big difference, especially on bands such as 160m and 10m, which may not otherwise show much activity owing to conditions.

Bob, G3PLP wrote and said that he managed all 12 band slots in slightly less than an hour and wonders if anyone can beat that? Either way, as he says, it sets a target for next year!

For the first time, G3WGV's Starlog software was used by the team. This enabled tight integration and close communication between the different teams. Well done John and thanks for all your efforts in getting the software right.

WHAT'S YOUR FAVOURITE CONTEST?

It occurred to me the other day that it would be interesting to find out what your favourite contest organised by the RSGB is? Please understand that this is unofficial – but you can be sure that I will pass the results on to the relevant contest committees, if a meaningful response is received. Drop me an e-mail at tim@g4vxe.com with details of the RSGB contest that you enjoy the most – feel free to nominate an HF and VHF event.

CONTESTS THIS MONTH

September is a transition month – a transition from the portable events of the summer to the big HF contests of the autumn and winter. SSB Field Day takes place on the 3rd and 4th September. This contest is very definitely a club activity and provides an ideal introduction to HF contesting for newcomers. I should know, it's how I ran into the Cheltenham Amateur Radio Association

Phil, G4OBK gets 80m CW going at GB5HQ as Steve, G3VMW and John, G3LZQ look on.

on the Cotswolds, many years ago. The same weekend there's the 144MHz Trophy, which is perhaps my favourite 2m contest of the year. There's lots of activity from all over Europe and particularly in the West of England – it's not unusual to hear Spanish stations in the Pyrenees. Stations over on the East Coast will hear stations well into mainland Europe too. Concurrent with the end of the 144MHz Trophy is the final 144MHz Backpackers event which provides low power stations an opportunity to make some great contacts. We usually find that taking a Morse key can eke out stations at a greater distance too!

The excellent Worked All Europe SSB contest takes place on HF on the 10-11 September – don't be put off if someone offers to send you a QTC (it's just a list of stations they've worked). On 17-18 September there are a couple of contests of note – the Scandinavian Activity Contest CW leg and also the Washington Salmon Run. Don't forget that salmon prizes can be won in this one – and Steve GW4BLE has the photo to prove it! On the 24th and 25th there's the SSB leg of the Scandinavian Activity Contest and one of the big RTTY events of the year, the CQ WW RTTY, which usually brings out plenty of good RTTY activity.

Remember there's plenty of free software available for these contests so there's no reason not to support them with an entry, even if you only find a few minutes during the weekend to go on. I'll look forward to hearing how you get on.

RSGB AFS CW CONTEST JANUARY 2005.

The CW Affiliated Societies' Contest is always an incredibly popular event with 2005 being no exception. This year saw 246 entrants from 87 teams fight it out for the top spots with again the individual section providing the most interesting and exciting competition (Final standings on page 54).

Lichfield ARS A (G0MTN G3SJJ G3NKC G3BJ G3VHB) once again top the team table with 12,350 points, picking up the Edgware trophy, followed by Mid Beds Contest Association with 12,140 points. Lichfield held the lead from the start with all team members finishing in respectable places within the individual table.

In the individual section Dave Sharred G3NKC wins the Marconi Trophy with 2,690 points, very closely followed by Cray Vally's Dave Lawley G4BUO with 2,670 points. G3NKC made a strong start and maintained first place for the majority of the session. Fraser Robertson G4BJM held second until G4BUO took over at the half way point. With his improved rate continuing, he eventually stole the lead going into the final hour but was just picked at the post by two QSOs by G3NKC. Congratulations to all.

Further down the table, competition was even fiercer with positions swapping throughout the four hours.

A special note should also be made of an entry from Martin Platt GD0EMG who would have been placed third overall with 2,640 points had the club been affiliated. Martin's entry shows it is possible to be successful even from a more northern location.

Accuracy from all the leading entrants was excellent, and with a much larger number of logs arriving in the required Cabrillo format, the quality of log submissions was also very good.

Propagation overall was as to be expected for the time of year, giving highly unpredictable highs and lows during the early hours but becoming more and more stable as the UK moved into darkness.

As this particular contest runs straight through a UK sunset there are numerous DX possibilities for a band such as 80m. This year it came in the shape of JA6LCJ and JA2XYO who appear in a number of entrant's logs, as does 5B4AGC. Many thanks to all the competing teams and their members who took part. ♦

CONTEST CALENDAR

HF Contests

Date	Time	Contest	Mode	Bands	Exchange
03/04-Sep	1300-1300	RSGB SSB Field Day	SSB	3.5-28	RS+SN
10/11-Sep	0000-2359	Worked All Europe	SSB	3.5-28	RS+SN
17/18-Sep	1200-1200	Scandinavian Activity	CW	3.5-28	RST+SN
17/18-Sep	1600-0700	Washington Salmon Run(1)	CW/SSB	3.5-50	RST+DXCC Country (eg GM)
18-Sep	1600-2359	Washington Salmon Run(2)	CW/SSB	3.5-50	RST+DXCC Country (eg GM)
24/25-Sep	0000-2359	CQ WW RTTY	RTTY	3.5-28	RST+CQ Zone (eg 14)
24/25-Sep	1200-1200	Scandinavian Activity	SSB	3.5-28	RST+SN

VHF Contests

Date	Time	Contest	Mode	Bands	Exchange
03/04-Sep	1400-1400	RSGB 144MHz Trophy	ALL	144	RST+SN+Locator
04-Sep	1100-1500	RSGB 144MHZ Backpackers	ALL	144	RST+SN+Locator
06-Sep	2000-2230 *	RSGB 144MHz activity & Club Championship	ALL	144	RST+SN+Locator
13-Sep	2000-2230 *	RSGB 432MHz activity	ALL	432	RST+SN+Locator
18-Sep	0900-1200	RSGB 2nd 70MHz	ALL	70	RST+SN+Locator
20-Sep	2000-2230 *	RSGB 1.3GHz/2.3GHz activity	ALL	1.3G/2.3G	RST+SN+Locator
27-Sep	2000-2230 *	RSGB 50MHz activity	ALL	50	RST+SN+Locator

*Local. The times of all contests are given in UTC. The full rules of RSGB contests are published in the RSGB Yearbook 2005 and are also available at www.contesting.co.uk/hfcc (HF Contests) and www.blacksheep.org/vhfcc (VHF / UHF Contests). Both sites are linked from www.rsgb.org

RSGB AFS CW Contest January 2005.

Club Listing.

Club	Call 1	Call 2	Call 3	Call 4	Call 5	Score
LICHFIELD ARS A	G0MTN	G3BJ	G3NKC	G3SJJ	G3VHB	12350
MID BEDS CA	G4BJM	G4BWP	G4PIQ	G5LP	G3PJT	12140
ADDISCOMBE ARS A	G3SJX	G4ALE	G3UFY	G3VYI	G3RQZ	11120
GMDX YORKSHIRE A	G4RCG	G4OBK	G3AB	G4BYG	G3LZQ	10950
GRIMSBY ARS A	G3TBK	G3RXP	M0AJT	G3RSD	G4EBK	10840
DE MONTFORT UNI ARS	G3RIR	G0WWW	G4ARI	G3ZBE	G4EOF	10660
BRISTOL CONTEST GROUP A	G3ZVW	G0WKW	G3XSV	G3YHV	G3TKF	9790
CDXC	G3RTE	G0CKP	G4DJX	G3WPH	x	9400
GMDX A	GM3WUX	GM3JKS	GM6NX	GM3YTS	GM4OSS	9220
HORSHAM A	G3LET	G3OGP	G3VQO	G3ZBU	G3SWC	8760
NEWBURY AND DISTRICT ARS A	G0ORH	G3KLH	G3NVO	G3ZGC/P	G4FON	8620
SUTTON AND CHEAM RS	G0KBL	G4ERW	G3DCZ	G4CWH	G4HSD	8310
ECHELFORD ARS A	G4TSH/P	G3KKQ	G3MCK	M0AJM	G3NOH	7980
STOCKPORT RS A	G0LZL	G3SHF	G3OAG	G3SVW	G3RTU	6950
DRAGON ARS A	GW0GEI	GW0ETF	GW3EIZ	GW3PRL	GW8IRZ	6810
NORFOLK ARC A	G3PDH	G3LDI	G3VZT	G4ARN/P	G4DYC	6520
CHELTENHAM ARA A	G3NKS	G4ENA	G4BGW	G3ZKN	G3XMM	6410
RNARS PORTSMOUTH	G3LIK	G2JL	G3KKJ	G3LWI	x	6350
RNARS COLCHESTER	G3GLL	G3YEC	G0IBN	G3OOK	x	6290
BRISTOL CONTEST GROUP B	G3YIQ	G0HFX	G3OLB	G3RFX	G0JLF	6150
CHESHAM AND DISTRICT ARS	G3MEH	G3VRY	G3XZG	G4XRV	x	5920
SCUNTHORPE STEEL ARC A	G0OKF	G3KNU	G4GZB	G4JRY	G4OGB	5630
CRAY VALLEY RS	G4BUO	G3YJW	G3RCV/P	2E0ATY	x	5580
MAIDENHEAD & DISTRICT ARC	G3PQA	G3RZF	G4WJS	x	x	5570
CONTEST CAMBRIA	GW3SQX	GW3NJW	GW4BLE	x	x	5000
YEOVIL A	G3GC	G3ICO	G3CQR	G3BPM	G3TSK	4950
TORBAY ARS	G0IVZ	G3LHJ	G0RDO	G0WWD	G3SNU	4930
RNARS INVERGORDON	GM4SID	GM3CFS	MM0WPM	GM3NCS	x	4690
HORNDEAN DARS A	G3PSM	G4FBS	G0MBQ	G0UHM	G0RPX	4580
EDGWARE DRS	G3ASR	G4KEW	G4IUZ	x	x	4300
FARNBOROUGH DRS	G3HEJ	G0VYR	G4BJQ	G3OFA	x	4100
BRACKNELL ARC	G3NCN	G3YMC	G4DDL	x	x	3960
RAFARS WADDINGTON	G4KKG	G3SET	G0SWO	M0CES	G3UYV	3810
HARWICH ARIG	G0DVJ/P	G4EYE	G3VMP	x	x	3650
ADDISCOMBE ARS B	G4CMF	G3JJZ	x	x	x	3350
FLIGHT REFUELLING ARS	G0WAL	G4POF	M0PTR	M0AKY	x	3330
GRIMSBY ARS B	G4LPD	M0BZU	G0GDU	G0IOR	x	3310
GMDX B	GM4AFF	GM4ZRR	x	x	x	3130
STRATFORD-ON-AVON & DRS	G0MRH	G3MXH	x	x	x	2870
CLIFTON ARS	G4DBW	M0BPQ	x	x	x	2810
HARWELL ARS	G0ADH	M0DDT	G0THY	x	x	2630
HADLEY WOOD CONTEST GROUP	G4KZD	G6B0x	x	x	x	2610
RNARS BIRMINGHAM	G3TZM	G4SFO	x	x	x	2480
TAUNTON & DISTRICT ARC	G0EYR	G0PSE	G3WNI	x	x	2460
GUILDFORD & DRS	G3ZDD	G0EFO	x	x	x	2430
LOWESTOFT DIST AND PYE ARC	G4CKH	G4RLS	x	x	x	2260
WESTERN SUPER MARE RS	G3TJE	G3YOL	x	x	x	2250
ORKNEY ARC	MM0MWW	x	x	x	x	2220
RAFARS DEVON	G3LUW	G8PQ	x	x	x	2110
NORTHAMPTON RC	G4CZB	x	x	x	x	2080
GUERNSEY ARS	GU4YOX	x	x	x	x	1940
G6PZ CONTEST GROUP	G4DRS	x	x	x	x	1910
HORSHAM B	M3RRH	G4FQR	M0GJH	x	x	1840
SOUTHDOWNS ARS	G3SVL	G3WQK	x	x	x	1820
RNARS LIVERPOOL	G3RFH	G3HWS	x	x	x	1710
STEVENAGE & DISTRICT ARS	G4DDX	x	x	x	x	1700
READING DARC	G0LHZ	M5ALG	x	x	x	1700
RAFARS COSFORD	M0BYJ	G0EYX	G0BYA	x	x	1690
ECHELFORD ARS B	G3EAO	G3WWT	G3JUL	x	x	1630
RNARS ROSYTH	GM3UM	GM3HUN	x	x	x	1600
HUNTINGDONSHIRE ARS	G4LHI	M5ABN	M0DRK	M5AGL	G0XAH	1570
GLENROTHES DARC	GM3YBQ	GM4WLN	x	x	x	1550
GMDX YORKSHIRE B	G3VMW	x	x	x	x	1540
MILTON KEYNES ARS	G0GGU	M0TIF	x	x	x	1250
RNARS NEWCASTLE	G3AWR	x	x	x	x	1180
RNARS LONDON	G4FRN	x	x	x	x	1150
BASINGSTOKE ARC	G4RCD	x	x	x	x	1120
MEIRION AMATEUR RADIO SOCIETY	GW3SB	x	x	x	x	1010
MALVERN HILLS RAC	G4BVY	x	x	x	x	1000
FISTS	GW4HDB	x	x	x	x	950
HEREFORD AND DARS	G3ZRJ	x	x	x	x	890
WYTHALL ARC	M0COP	x	x	x	x	860
WORTHING DARC	G4SLE	x	x	x	x	800
LICHFIELD ARS B	G0DAY	G3NAS	x	x	x	710
CHELMSFORD ARS	G4ZUL	x	x	x	x	680
GLOUCESTER ARES	G3MA	x	x	x	x	580
SOUTHGATE ARC	G3GUL	x	x	x	x	500
SCUNTHORPE STEEL ARC B	G0AOJ	x	x	x	x	360
RNARS CARDIFF	GW4KVJ	x	x	x	x	360
NORFOLK ARC B	G7SOZ	x	x	x	x	330
COCKENZIE & PORT SETON ARC	GM4UYZ	x	x	x	x	320
CHELTENHAM ARA B	G4PDQ	x	x	x	x	300
STOCKPORT RS B	G3GMM	x	x	x	x	230
NEWBURY AND DISTRICT ARS B	G3RVM	G6FOP	x	x	x	230
DRAGON ARS B	GW3HCL	x	x	x	x	220
YEOVIL B	G0HDJ	x	x	x	x	190
COLCHESTER RA	G3FIJ	x	x	x	x	140
HORNDEAN DARS B	M0CAA/P	x	x	x	x	70

Individuals Listing.

Position	Call	Score
1	G3NKC	2690
2	G4BUO	2670
3	G4BJM	2610
4	G4TSH/P	2560
5	G3SJJ	2500
5	G3TBK	2500
7	G4BWP	2470
8	G3RTE	2460
8	G3VHB	2460
10	G4DJX	2450
10	G5LP	2450
12	G3NKS	2430
12	G3RIR	2430
12	G4RCG	2430
15	G0CKP	2420
15	G3BJ	2420
15	G3SJX	2420
18	G4PIQ	2340
19	GW3SQX	2330
20	G3ZVW	2310
21	G4ALE	2300
21	G4OBK	2300
23	G0MTN	2280
23	G0WWW	2280
25	G3PJT	2270
26	G3AB	2260
26	G3UFY	2260
28	G3RXP	2240
28	G4ARI	2240
28	GM3WUX	2240
31	G3LET	2220
31	MM0MWW	2220
33	G3PSM	2170
34	M0AJT	2160
35	G4ERW	2140
35	GM3JKS	2140
37	G3PQA	2130
37	GM4AFF	2130
39	G0KBL	2120
40	G4CZB	2080
41	G3KLH	2070
41	G3RQZ	2070
41	G3VYI	2070
41	G3WPH	2070
45	G0LZL	2040
45	G3PDH	2040
45	G4BYG	2040
48	G3RSD	2030
49	G3OGP	2020
50	GM4SID	2010
51	G4WJS	2000
51	G4CWH	2000
53	G3KNU	1990
53	G3LIK	1990
55	GW0GEI	1980
56	G3HEJ	1960
57	GM6NX	1940
57	GU4YOX	1940
59	G0WKW	1930
59	G3ZBE	1930
61	G3LZQ	1920
62	G4DRS	1910
62	G4EBK	1910
64	G0DVJ/P	1900
64	G3GLL	1900
64	G3XSV	1900
67	G3LDI	1870
68	G2JL	1860
69	G3MXH	1850
69	G3TKF	1850
69	GM3YTS	1850
72	G0ORH	1830
72	G4OGB	1830
74	G0IVZ	1810
75	G3YEC	1800
75	G3YHV	1800
77	G3YJW	1780
77	G4CMF	1780
77	G4EOF	1780
80	G4IUZ	1760
81	G0IBN	1750
81	G3TJE	1750
83	G3KKQ	1730
84	G3VZT	1710
85	G4DDX	1700
85	G4KKG	1700
87	G3LHJ	1670
87	G4ENA	1670
89	G3SVL	1660
90	G3VQO	1650
91	G3YIQ	1640
91	G3ZGC/P	1640
91	G4KZD	1640
94	G0EFO	1630
94	G4XRV	1630
96	G3SHF	1620
96	G3XZG	1620
98	G4EYE	1600
99	G3JJZ	1570
99	M0BPQ	1570
101	G3ASR	1560
101	G4FON	1560
103	GW3NJW	1550
104	G3OAG	1540
104	G3VMW	1540
106	GW0ETF	1530
107	G3NVO	1520
108	G0ADH	1500
109	G4CKH	1490
110	G0HFX	1480
111	G3SET	1460
111	G3ZBU	1460
113	G3RZF	1440
114	G3OLB	1430
115	G3SWC	1410
116	G3KKJ	1400
117	G3VRY	1380
118	G3TZM	1350
118	G3YMC	1350
118	GW3EIZ	1350
121	G0LHZ	1340
121	G3MCK	1340
123	G0PSE	1330
123	G4DDL	1330
125	G3MEH	1290
126	G3GC	1280
126	G3NCN	1280
126	G3RFH	1280
126	G3RFX	1280
130	G4DBW	1240
131	G3LUW	1230
131	G3NOH	1230
133	G3DCZ	1180
133	G3AWR	1180
135	G4FRN	1150
135	GM3CFS	1150
137	G4SFO	1130
137	M0BZU	1130
137	M0PTR	1130
140	GW4BLE	1120
140	G4LPD	1120
140	G4RCD	1120
140	M0AJM	1120
144	G3LWI	1100
145	GM4WLN	1090
146	G3CQR	1080
147	GM4OSS	1050
147	GW3PRL	1050
149	G0MRH	1020
149	G3ICO	1020
151	GW3SB	1010
152	G3RCV/P	1000
152	G4BGW	1000
152	G4BVY	1000
152	GM3UM	1000
152	GM4ZRR	1000
157	G4KEW	980
158	G3SVW	970
158	G6BOX	970
160	GW4HDB	950
161	G0VYR	940
161	G4FBS	940
163	GW8IRZ	900
164	G3ZRJ	890
165	G8PQ	880
165	MM0WPM	880
167	G4HSD	870
168	G0WAL	860
168	M0COP	860
170	G0GGU	850
171	G0MBQ	840
171	G3OOK	840
173	G4SLE	800
173	G3TSK	800
173	G3ZDD	800
176	G0GDU	790
177	G3RTU	780
178	G3BPM	770
178	G4RLS	770
178	M3RRH	770
181	M0DDT	760
182	M0BYJ	740
183	G3EAO	730
184	G0RDO	710
185	G3WNI	700
185	G4JRY	700
185	M0GJH	700
188	G4BJQ	690
189	G0EYX	680
189	G4POF	680
189	G4ZUL	680
192	G3HKO	660
192	G3XMM	660
192	M0AKY	660
195	G3ZKN	650
195	GM3NCS	650
197	GM3HUN	600
198	G3WWT	590
199	G3MA	580
200	G0OKF	560
201	G4GZB	550
202	M5ABN	530
203	G3OFA	510
204	G4ARN/P	500
204	G3GUL	500
204	G3YOL	500
207	G4LHI	480
208	GM3YBQ	460
209	G0EYR	430
209	G3HWS	430
211	G3NAS	420
212	M0TIF	400
212	G4DYC	400
214	G3SNU	380
215	G0THY	370
215	G4FQR	370
217	G0AOJ	360
217	G0WWD	360
217	GW4KVJ	360
217	M5AGL	360
217	M5ALG	360
222	G0UHM	330
222	G7SOZ	330
224	G0JLF	320
224	GM4UYZ	320
226	G3JUL	310
226	M0CES	310
228	G0RPX	300
228	G4PDQ	300
230	G0DAY	290
231	G0BYA	270
231	G0IOR	270
233	G0SWO	250
234	G3GMM	230
235	GW3HCL	220
236	G0HDJ	190
237	G3WQK	160
238	G3RVM	150
238	G3VMP	150
238	M0DRK	150
241	G3FIJ	140
242	2E0ATY	130
243	G3UYV	90
244	G6FOP	80
245	M0CAA/P	70
246	G0XAH	50

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A real Buzz at the National Space Centre

Moon-walker Buzz Aldrin visits the NSC ♦ Update on *Cassini-Huygens* ♦ APT receiver kit available ♦ SSTV from the *ISS*

PHOTO: ANDY THOMAS, G0SFJ

Saturday 6 June was a very special day for visitors to the National Space Centre in Leicester. Dr Buzz Aldrin, only the second man to walk on the Moon, spent the day at the centre where he toured the galleries, visited the Challenger Centre, lectured to an invited audience in the Space Theatre, signed copies of his latest book *Reaching for the Moon*, and finally giving an inspiring address from the balcony to all of the visitors at the Centre. Buzz was clearly impressed by the Centre and its mission. He talked in a relaxed way about the prospects for missions to Mars, the part the current generation of school students would be playing in the future exploration of space, and of the real possibilities for 'Space Tourism', allowing many more people to have the wonderful experience of going into space. I was privileged to attend the morning lecture to hear Buzz, and also the introduction given by Kevin Yates of the Space Centre, which I found every bit as inspiring. Here are few highlights from that introduction:

"In a world where we are so often confronted with the worst of which mankind is capable, it's a genuine pleasure to introduce a man whose achievements encapsulate humanity's greatest dreams.

"The spirit of Apollo is one of determination, optimism and courage. Yet these virtues are not inherent in any program or project, they have their origin in the human spirit."

There was a special moment during Buzz's balcony speech, when he pointed down to one of the large photo montages in the gallery showing the image of Neil Armstrong's boot print on the Lunar surface. Buzz remarked "You're taking photos of me; just down there is a photo I took". Within seconds, the entire audience broke into a spontaneous burst of applause to create a special and memorable moment.

CASSINI – HUYGENS UPDATE

RadCom's 'Space' page reaches a much higher orbit than I had expected.

My item for the May 2005 issue of *RadCom* was based on a long article on the IEEE Forum, which suggested that engineers had not anticipated the effect on data rate of Doppler shift. It gave the major credit to Boris Smeds for saving the mission by analysing this problem. I am grateful to Luitjens Popken, a member of the Huygens Recovery Task Force for bringing to my attention the IEEE follow-up piece and he quotes "Salvaging the mission was a tremendous joint effort by many contributors from ESA, NASA/JPL, the scientific community and industry". To Luitjens, Boris Smeds and all of their colleagues on the project, thanks for making this mission an outstanding engineering and scientific success.

RX2 WEATHER SATELLITE APT RECEIVER KIT IS AVAILABLE AGAIN

The long-awaited journal from the Remote Imaging Group carried an advert for the famous RX2 receiver kit. For sale to members, it costs £90 including postage. Everything is supplied, except the case, S-meter and connectors. *WXtoImg* software is included. This works with your PC soundcard and RX2 to process and display the images. I built an early version of the RX2 about five years ago; it's in use nearly every day and going strong. Visit the RIG website for details.

Left:
SSTV from MIR.

Centre:
Buzz Aldrin leaving the Challenger Centre at the NSC.

Right:
More SSTV from MIR, received by W8ZCF.

SLOW-SCAN TELEVISION FROM THE ISS

The major European contribution to the *ISS*, the Columbus Science Laboratory, is nearing completion and will be launched soon. Situated well away from the other modules, it may be used as temporary crew sleeping quarters. This could increase the opportunity for random voice contacts with the astronauts on 2m. But that's not all. With the additional amateur radio antennas on Columbus, and the plans to establish a slow-scan TV capability, things could get exciting. SSTV from *MIR* was very successful, and now it's a much easier mode. Reception is simple using your PC soundcard and any one of the many excellent SSTV programs which are readily available. There is not space to describe the system fully. Details can be found on the ARISS website.

YOUR INPUT ALWAYS WELCOME

Letters and e-mails from readers often prompt further research leading to articles for this page. If you have any questions, or requests, I would be delighted to receive them. You may even have old recordings or space-related materials tucked away in your shack that deserve to be written up for the page. Please feel free to contact me by e-mail to the address at the head of this page, or by post. ♦

WEB SEARCH

ARISS	www.ariss-eu.org
SSTV from MIR	put SSTV+MIR in the search line of your browser
Remote Imaging Group	www.rig.org.uk

SHOWROOM & MAIL ORDER:
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PSUs

DIAMOND GZV-4000

Diamond quality power supplies/ switch mode. 40 amp version

Includes built-in speaker

£129.99

Model	Input voltage	Output voltage	Output current	Dimensions (W x H x D)mm	Weight	Price
GZV4000 (switching)	240V	5-15VDC variable	40A continuous	210x110x300	3.5kg	£129.99
GZV2500 (switching)	AC 240V	5-15VDC variable	25A continuous	210x110x220	2.5kg	£99.99

NISSEI MS-1228

28A at 13.8V yet under 2kgs. (H 57mm, W 174mm, D 200mm approx). Fully voltage protected. Cigar socket & extra sockets at front/rear. Ultra slim.

NISSEI HAVE BECOME RENOWNED FOR PUTTING QUALITY FIRST, YET MAINTAING A GOOD PRICING STRUCTURE. A TRULY SUPERB POWER SUPPLY UNIT

'Smallest version to date' now with cigar socket.

OUR PRICE £69.95 Delivery £10.00

NISSEI PS-300

TRUE 'LINEAR' PSU

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear. Dim'ns: 256(W) x 135(H) x 280(D)mm.

A truly professionally made unit built to outlast most PSUs.

30 AMP/12 VOLT PSU

SUPERB VALUE AT £119.95 Del £10.00

HF TRANCEIVERS

KENWOOD TS-570DGE

In our opinion, the best HF transceiver below £1200.

INCLUDES ATU

OUR PRICE £749.99

PS-53 matching PSU £199.99

Kenwood TS-480SAT – Special offer (incl's Heil mic) £699.99

KENWOOD TS-2000

New all mode multibander: HF/50/144/430 optional 1200MHz.

TS-2000 + PS-300 PSU £1379.00

OUR PRICE £1299.00

Matching PSU £199.99

ICOM IC-7400

HF+6m+2m.

OUR PRICE £1099.99

IC-756 PROIII

Best ever £Phone

YAESU FT-817 ND

100kHz-440MHz (with gaps). All mode transportable. Includes NIMH battery/ charger. Latest 2005 spec.

INCLUDES FREE HEADSET

£449.99

Optional Yaesu carry case £20.00

FT-817 ND + MS-1228 PSU £499.99

YAESU FT-857D DSP

The ultimate HF excitement in a small package. HF + 6m + 2m + 70cm. Incl's digital signal processor unit. Incl's optional DSP unit

Optional detatch kit £44.99

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YAESU FT-897D

HF + 6m + 2m + 70cm all mode. An amazing DSP Tcvr for base/mobile or portable use. Very little has been left out!

INCLUDES FREE HEADSET

CRAZY PRICE £639.99

FT-857 + PS-300 bundle £729.99

HF RCV'RS

REALISTIC DX-394

Send SAE for review

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Noise blanker.

OUR PRICE £199.95 P&P £10

SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/ stereo earphones/carrying case. Superb SSB performance.

240V Power Supply £24.95

OUR PRICE £159.95 P&P £10

SANGEAN ATS-909

IDEAL FOR NAVTEX RECEPTION

A superb performance all mode synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. Other features include RDS facility, 306 memories and WFM. Incl's case/earphones/wind-out antenna.

SEND SAE FOR DATA SHEET

240V Power Supply £16.95

£139.95 P&P £10

VHF/UHF RADIOS

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

ICOM IC-2725

2m/70cm (50W/35W) dual receivers (true dual bander) with wide band recieve.

Now includes free headset & boom mic worth £39.99

£265.00

ICOM BARGAINS

IC-E208.....£235.00 IC-910H £1075.00
IC-E90 .....£265.00 IC-910X.....£1199.00

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

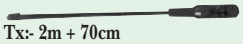
Optional headset (Boom mic) £24.99

SUPER-GAINER RH-9090

SMA 40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm. Rx:- 25MHz-2.9GHz

OUR PRICE £26.95 P&P £1.50

SUPER-GAINER RH-9000



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

OUR PRICE £21.95 P&P £1.50

YAESU VX-2E

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

YAESU BARGAINS

FT-1000MP MkV (200W)..£1999.99 FT-2800M £149.99
FT-8900 .....£325.00 FT-7800 .....£219.00

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W).....£79.95 P&P £5
RS-102 1.8-150MHz (200W).....£59.95 P&P £5
RS-402 125-525MHz (200W).....£59.95 P&P £5
RS-3000 1.8-60MHz (3kW) Incls mod meter £79.95 P&P £5
RS-40 144/430MHz Pocket PWR/SWR .....£34.95 P&P £2
DL-30 diamond dummy load (100W max) ...£26.99 P&P £3

ACCS

SGC MAC-200

New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it. (5 selectable outputs).

OUR PRICE £229.95

SGC-239 Mini tower ATU (1.8-30MHz).....£169.99
SGC-230 (HF-200W) ATU £319.99
SGC-237 HF+6m Tuner.....£269.99
SGC-231 HF+6m (Deluxe) £319.99

MFJ-993

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

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MFJ-949E

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

SPECIAL £129.99

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UK VERSION

HF digital SWR analyser + 1.8-170MHz.

NOW £189.99 P&P £7

Optional case £22.99

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MFJ-901B Superb versitile ATU .....Now £72.99
MFJ-784B DSP filter ~~£249.00~~.....Now £149.99

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

New station log books (A4) **£4.99** P&P £2.00
5 log books **£20.00** P&P £6.50

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

CUSHCRAFT BARGAINS *Delivery £12.00*

MA5B	Mini beam 10, 12, 15, 17, 20m	~~£389.00~~	£329.95
A3S	3 ele beam 10, 15, 20m	~~£499.95~~	£379.00
A4S	4 ele beam (10-20m)	~~£599.95~~	£449.99
R-6000	Vertical 6, 10, 12, 15, 17, 20m	~~£349.95~~	£315.95
R-8E	Vertical (40-10m) "special"	SPECIAL ~~£499.95~~	£399.99

CAROLINA WINDOM

CW-160S (160-10m) 40m long .....£119.95 P&P £8.50
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CW-80S (80-10m) 20m long.....£109.95 P&P £8.50
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12" Dxer's quartz wall clock. give:- 24hr time + 3 smaller dials give 12 hour time/day of week/date.

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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).

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TH-887 headset

ADAPTERS FOR MOBILE TCVRS AVAILABLE – PHONE

Superb headset for most handies.
887K (fits Kenwood) £24.95.
887 fits most twin socket-Alinco, Icom, Yaesu, etc.

£24.95 P&P £3

FIBRE GLASS POLES *Del £10.00*

	1½"	1¾"	2"
1m	£8.50	£12.50	£13.50
2m	£16.00	£24.00	£26.00

Longer lengths available – phone

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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 .....£18.99 P&P £6
New RF grounding wire (10m pack) PVC coated.....£12.50 P&P £5

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 £2.50

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).

PULLEY **£8.99** + P&P £2.50

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

WALL BRACKET **£2.99** P&P £1.00

BARGAIN WINCH

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

Winch wall bracket.....£19.99

COAX BARGAINS

RG-213 Mil spec x 100m.
£69.99 or 2 for £110.00 P&P £10

RG-58 Mil spec x 100m.
£35.00 or 2 for £50.00 P&P £10.00

Coax stripping tool (for RG-58) £4.50

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 £2.50 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
BNC - BNC	5m	£10.00

MOBILE ANTENNAS *P&P £8.50*

DB-770M 2m/70cm (3.5 - 5.8dB) 1m PL-259 .....£24.95
DB-7900 2m/70cm (5.5 - 7.2dB) 1.6m PL-259 .....£39.95
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-80 80m mobile whip (64" long).....£24.95
PLT-259 PL-259 converter for above £5.95

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.

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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

METAL WORK & BITS *P&P available on request*

2.4m/2" alloy poles £19.99
2" Mast base plate .....£12.95 P&P £5
6" Stand off.....£6.95 P&P £5
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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 (ideal for G5RV).....£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

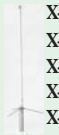
Q-TEK INDUCTORS

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).....£1/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) £69.95
X-510 GF 144/70, 8.5/11dB (5.4m) .....special £89.95
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m) ..£79.95

BALUNS & TRAPS

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

1kw Handling

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)

CAR BOOT MAST SET

Once they've gone, they've gone! 5 section (15') 4.5m 1¼" slot together mast set. Collapsed length 0.92m (3') makes this ideal for travelling.

£24.99 Del £10.00

2 for £35.99 del £12.00 3 for £45.99 del £12.50

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.

TWO FOR £90.00 DEL £12.50

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 SCRAP PRICE **£19.95** Del £10.00

Trevor Brown, G8CJS

E-mail: chairman@batc.org.uk

ATV

DATV in the news again ♦ ATV from space ♦ Callsign change for IoW repeater ♦ ATV repeater status

DATV is in the news again. Dr Uwe E Kraus, DJ8DW, and his team have finished the development work on GMSK and now have working modules. The two modules produce a 70cm signal with a bandwidth of 2MHz. and were demonstrated live at Friedrichshafen. The 70cm DATV link was set up on the German side of Lake Constance to transmit pictures on 70cm using GMSK modulation and was received on Mount Pfaender some 20km away. This link was the relayed again using DATV, but this time on 23cm using QPSK into the exhibition at Friedrichshafen, a distance of 38km. After lunch the GMSK link was relocated to Gehenberg for another demonstration of GMSK over a distance of 38km.

ATV FROM SPACE

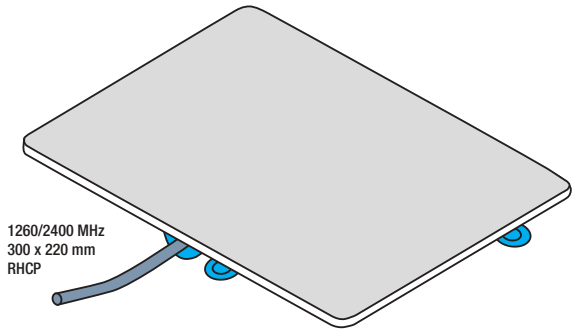
Uwe has also been in discussion with Gaston Bertels, ON4WF, the ARISS European Chairman, about the possibility of DATV equipment for Columbus. To this end, ESA have agreed to fund the cost of the cables and coaxial feed-throughs in the hull of the European Columbus module to enable 70cm, 24cm and 13cm antennas to be fitted to the external meteorite and debris protection system panels on Columbus. This facility could, for the first time, provide ATV for school contacts and continuing transponder operation as well as emergency communications for the astronauts. The special flat-plate aerials still need to be developed and manufactured. The Columbus module is expected to be launched sometime during 2006. The amateur community has been asked for donations to enable this work to be completed in time. The 24 and 13cm antennas have already been contracted for, but the 70cm ones still need more money! BATC has already donated 500 euros. The ARISS International Meeting that was scheduled to take place at the University of Surrey last month had this project on its agenda, so it is more than a vapourware concept! The full list of donations can be seen on the ARISS website and you can also add your own donations on line.

GB3PD/GB3IV

In the last column, I reported that the Southampton Club for Amateur Radio and Television had just installed a new 23cm ATV repeater on the Isle of Wight. For various reasons, the call sign has now been changed from GB3PD to GB3IV. Colloquially known as 'Island Video', the repeater is still operating on its temporary equipment, but it is hoped that the final equipment will be ready for installation soon, and will offer at least 10dB better receive performance than the temporary antennas. The first few months have seen a gratifying amount of use, with stations over a very wide catchment area managing to receive and/or send pictures. Under lift conditions they have seen pictures from a French station on the low-gain Alford Slot input.

The European Space Station.

FIG 1 © RADCOM 557



Curvature radius: 225cm
Weight of each antenna: <350g

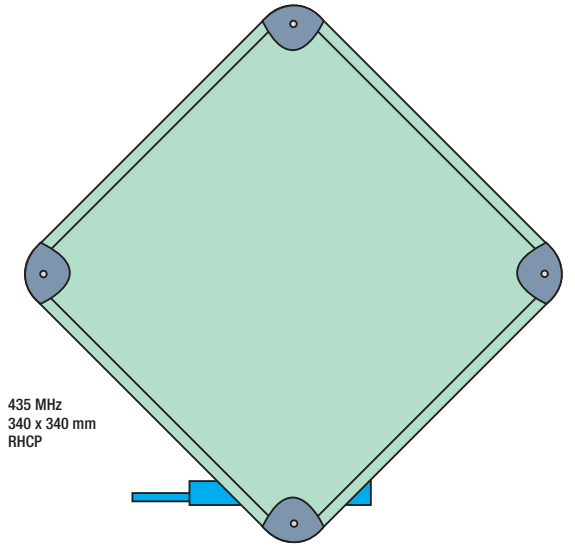


Fig 1
The flat plate antennas.

WEB SEARCH

ARISS	www.ariss-eu.org/columbus.htm
BATC	www.batc.org.uk

ATV REPEATERS

At a recent meeting, the ongoing delays to clearances for ATV repeater NoVs were discussed. At the time of writing, the following ATV repeaters remain 'in the system' where they have been for up to 9 months.

GB3LB – Birmingham, 13cm, Oct 2004
GB3RX – Coventry, 13cm, Nov 2004
GB3YV – Bradford, 13cm, Dec 2004
GB3TZ – Luton, 13cm digital output, Dec 2004
GB3BH – 10GHz input, Dec 2004
GB3GG – Grimsby 13cm, March 2005

It was also pointed out that GB3ZE – Yorkshire, 13cm, was applied for in February 2005 and cleared on 6 May – this suggests that maybe the others have somehow become 'detached' from the system.

It was noted that, for the time being, it will be difficult to progress applications quickly and efficiently, but the situation should become much better in a few months' time.

CQ-TV

CQ-TV No 211 is now available and has the results of the readers' questionnaire to find out what ATVers want and don't want in an ATV magazine. High up on the list are constructional articles. In this issue, Keith Webster explains how to adapt a commercial module purchased on eBay to be a 30W 13cm PA. Richard Carden, VK4XRL, produced some practical designs for digital and analogue filters. Mark Bloor explains HD-TV and Henry Ruh sorts out some of the misconceptions in digital communications. Sergi Ludanov, KD6CJI, puts NBTV onto a Mac, and Dicky Howett visits Scotland's museum of communications. ♦

Norman Fitch, G3FPK

40, Eskdale Gardens, Purley, Surrey CR8 1EZ.

E-mail: g3fpk@compuserve.com

VHF/UHF

As usual, Norman has a very busy and informative column, reporting on the effects of excellent Sporadic-E on 6m and exceptional tropo conditions on 2m.

A look at this month's annual table shows that several participants have increased their tally of grids and countries significantly. This is largely due to some excellent Sporadic-E (Es) propagation, particularly on 6m, as well as some exceptional tropospheric conditions on 2m. Commenting on the remarks of Bryn Llewellyn, G4DEZ, about background noise level in the July 'VHF/UHF', Brian Carter, G8ADD, paints a very different picture. On 2m he hears an average of 52 assorted carriers, burblers and warblers that lift the S-meter between 144.200 and 144.400MHz on any beam heading. About 20 of them are over S9 with one of the strongest wobbling about the 144.300MHz calling frequency. He rarely calls CQ since he wouldn't be able to hear any weak replies and he doesn't want to be stigmatised as 'cloth-eared.' He concludes, "Frankly, if it wasn't for the extra interest generated by the SOTA program, I would be inclined to abandon the 2m band except for rag-chewing."

Martin Addison, M3JUQ (IO91), got his Foundation Licence in mid-May and has been on 2m FM. He has put out numerous CQ calls with his permitted 10W without getting any replies. He suggests that this bears out G4DEZ's comment about people not wanting to work weak stations. He concludes that, if you don't get a reply, tune around the band listening for stations that you can copy well and give them a call at an appropriate time.

TABLE NOTES

Since January this year, the annual table has been based on locator 'squares' - more aptly known as grids since they cannot be true squares - and DXCC countries, or entities as they are now called. I have updated the rules and if you would like a copy, send me an e-mail. When updating your annual table and all-time locator squares table scores please state the totals to date, just as they appear in the tables. Asking me to add odd figures to your previous totals can be confusing. If you have more than one callsign, please make it quite clear which one should appear.

THE FOULA DXPEDITION

Keith Tatnall, G4ODA, sent a very detailed account of the DXpedition he and Paul Bradfield, G1GSN, made in June to the island of Foula which is situated 20 miles east of mainland Shetland in IP80 grid. Paul made an 8 x 5 x 6ft high framework as the basis for the operating shack 120ft ASL and which was situated about a 30 minutes' walk from their rented cottage. They took a vast amount of equipment, much of it packed into a trailer.

They spent a lot of time operating on WSJT mode on 2m, completing 144 contacts in the 10-16 period. On 2m tropo they list 14 contacts plus some GM stations made in the 6-9, 13 and 14 period. ODX was SM2CEW (KP15) at 1366km on the 13th and another long haul contact was with PA0DD (JO21) at 1086km on the 7th. On 70cm they only made seven contacts, all with GMs, and just one on 23cm with GM6VXB (IO97) at 269km. On 4m they worked G4FUF* on some sort of scatter mode on the 10th, similarly G3JHM* on the 15th. After a tropo start on the 16th, they completed with GW8IZR on MS. On 6m they made 293 contacts, the majority via Es, the most productive day being the 10th when they had 106 contacts with stations in CN, CT, DL, EH, F, G, HB, I, OE, ON, PA, S5, SP, ZB and 9A.

Keith wishes to thank *RadCom* and *Dubus* for the publicity. Then to all the friends they made on Foula and for putting up with two mad Englishmen – in particular to Eric for permission to go through his croft. To Marion for putting up with his phone calls throughout the spring and in particular to Bryan who (whilst he was trying to get contact numbers for the consents needed) just got on and organised it all for them and who made all the transport arrangements on the island. Without him the DXpedition simply would not have happened. He thanks all the people who took time to work them and put them on the cluster. Thanks to David, G4DHF, for designing and providing the 6m antenna for use at the cottage and to Howard, G0VTL, for his help on the materials for the 'shack'. In particular to Bob, G1ZJP, for acting as liaison from phone to Internet (a difficult job with phone contact being so poor) and for setting up the website. And finally to Paul for putting up with him. Thanks for another job well done Keith and Paul. QSLs should be sent to G4ODA (QTHR) and not GM4ODA. Cards will be sent to all contacts but may take up to three months.

An overall site view of GM4ODA/P on Foula Island, showing the purpose-made 'shack' and the many antennas used by G4ODA and G1GSN during their successful DXpedition in June.

SOLAR AND GEOMAGNETIC DATA

The 10.7cm solar flux averaged 97.7 units in the 30 days to 12 July, very slightly up on last month's figure. The minimum value was 77, which occurred on 24, 25 and 27 June, while the maximum was 130 on 3 July. The SESC sunspot number dropped to zero on 26 June and the maximum recorded was 192 on 4 July. 12 new regions were noted. There were 20 geomagnetically quiet days in this period and the maximum middle-latitude A-index at Fredericksburg was 30 on 23 June when the estimated planetary Ap-index was 48. On 10 July the corresponding values were 28 and 47 respectively.

MOONBOUNCE

Joe Taylor, K1JT, is constantly improving his WSJT program and, at the time of editing, was working on a major upgrade. A maintenance release of WSJT, version 4.9.8, is now available in which several minor bugs have been fixed. Details are on the Update History website. WSJT version 4.9.8 can be downloaded from a second website - see 'Web Search.'

Johan Van de Velde, ON4IQ, posted the following on the Moon-Net website about the recent EME operation from Grenada, "Sadly we had an EA station QRM-ing us for a while (two days in a row) and, after that, calling on top of each station we where trying to work. There was also a G station that sent OO and even RRR when we still were at calls on the J3 side. Seems to be common practice by him to start call+OOO real fast, assuming he is loud on other end. Maybe a good idea for expeditions to sit and wait a bit before sending RO back to that station? Contrary to what the G claimed, we did not work him: how could we when sending just calls? These screen dumps are on the web page, most wave files available as well.

"There was one CW sked, but we did not hear anything. Most of the contacts were random on J3 side (as no Internet in shack), and a number of skeds where taken for day three to the end. Most skeds failed. Random worked much better, with average contact every 6 – 7 minutes. Working split 0.1 – 1.0 up helped too.

"Preparation has started for ON4QX's trip to PJ7 and FS (2m digital only

ANNUAL VHF / UHF TABLE - JAN TO DEC 2005

	50MHz		70MHz		144MHz		430MHz		1296MHz		Total
Callsign	Grid	Ctr	Grid	Ctr	Grid	Ctr	Grid	Ctr	Grid	Ctr	Points
G4DEZ	354	76	41	17	170	33	45	12	19	6	773
M0XLT	183	40	-	-	10	4	1	1	-	-	239
G4OBK	84	48	25	9	33	17	1	1	-	-	218
G8RWG	93	34	-	-	47	12	-	-	-	-	186
G8HGN	44	20	-	-	65	15	21	6	-	-	171
G6TTL	77	29	-	-	32	9	14	7	-	-	168
G3YDY	-	-	-	-	50	12	39	11	-	-	112
G4APJ	43	21	-	-	17	6	14	5	-	-	106
M5FUN	-	-	-	-	67	15	-	-	-	-	82
G3FIJ	4	1	8	2	17	5	9	2	-	-	48
G8VYK	-	-	-	-	34	14	-	-	-	-	48
G6HOU	-	-	-	-	19	6	-	-	-	-	25

The grids are the first four characters, eg IO91, and the countries are the current DXCC entities plus IT9.
Do not count EME contacts this year. The next deadline is 6 September.

with 17B2 antenna and 350W), and plans are made for 2006 trips. QSL for J3/K5AND go to N0QJM and your donations are most welcome."

In the July *432 and Above EME News*, editor Al Katz, K2UYH, comments on the poor conditions on 70cm in European World Wide contest in June. This is confirmed by Peter Blair, G3LTF (IO91), who found that the 90° Faraday rotation and extra 2dB path loss at Moon apogee made it hard going. Dave Dibley, G4RGK (IO91), also found it difficult due to severe libration and the geomagnetically-disturbed conditions. He completed with VK3UM, HB9Q, F6KHM, DL9KR, F2TU, SV1BTR, OZ4MM, K0RZ, SM2CEW and K5JL.

In July, Howard Ling, G4CCH (IO93), completed on 23cm CW with SM6CKU, N2UO, K5SO and K2UYH on the 2nd and with F1ANH next day. The September activity weekend is on 24/25, when London-latitude stations will have about 33.7 hours of Moon time. The declination varies from +28.60° to +26.61° and the signal degradation referred to perigee ranges from -1.57dB to -1.82dB. The 144 / 432MHz sky temperature varies from 575 / 44K to 330 / 24K and the Sun offset at Saturday midnight is -93°

METEOR SCATTER

Brian Oughton, G4AEZ, operator of club station G8VYK (JO01), using FSK441 on 2m, completed with GM4ODA/P (IP80), SM/DL2NUD (JO86), HA3UU (JN96), SP2MKO (JO93), ES0/DH8BQA (KO08) and EA2AGZ (IN91). On 12 July, G4DEZ completed random MS contacts on 2m with IK1SPR (JN34) and HA3UU (JN96) who was very loud with '39' reports exchanged.

BAND REPORTS

50MHz

First, a reminder about the band plan. 50.100 – 50.130MHz is the DX window and should only be used for inter-regional DX contacts. 50.110MHz is the inter-regional calling frequency which should be used for long-range DX contacts only and not for QSOs. If your CQ call is answered, please QSY. The IARU Region 1 SSB centre of activity is 50.150MHz. The recommended Operating Code of Practice can be seen on the UK Six Metre Group's website - see 'Web Search.'

In the period from mid-June until 11 July, covered by the report of Ted Collins, G4UPS (IO81), there were only seven days when he didn't note any activity. In his five-page list, I note the following contacts in June; IG9/I2AND (JM65) on the 19th, CN8IG (IM75) on the 27th and 5T5SN* (IK28) on the 30th. In July, CN2R (IM63) on the 5th (QSL via W7EJ); A45XR* (LL93) and TF8GX (HP84) on the 6th and 4Z5LA* (KM72) on the 8th. UT5G was a new beacon heard for the first time on 4 July at 1925. The EA3VHF beacon was copied at 0856 on 8 July on 50.070MHz giving its locator in JN01.

Ken Punshon, G4APJ (IO83), was QRV in the Trophy Contest over the 18 / 19 June weekend which brought lots of activity from Iberia and Italy. On 6 July, between 1530 and 2100, there was a major Es opening over northern Europe when signal strengths were incredible. With only 15W output he worked stations in HB9, TF, SM, YL, YU, OK, OZ, SP, DL, OM and PA. He says that TF8GX's signal was 'unbelievable' throughout the entire opening.

On 29 June, G4DEZ worked J3/K5AND and J68AS for two new DXCC countries and one new grid and TT8M* (KK03) on 1 July was another new grid and country. Bryn's patience was rewarded on the 7th when HV0A suddenly came up out of the noise. Later he contacted KP2A* and WP3UX*. He writes, "For propagation during minimum sunspot years, the DX into the Caribbean has been very good, distances from 5000 to almost 7000km. Is it really multi-hop Es or is there something else to think about? Not F_2."

Bob Harrison, G8HGN (JO01), caught the patchy Es opening to the Balkans on the Sunday of NFD when ODX was LZ1A (KN22) at 2055km and Z32GW (KN01) was grid number 359. On 12 June, Niels Montanana, G8RWG (JO01), worked KP4EIT (FK58) for his first trans-Atlantic contact. Other Es DX worked were GM40DA/P, ZA/IK0OKY (JN91), T9/IV3GTH/P (JN84), CN8IG, LY1CX (KO25), TF3XEN (HP94), TF8GX and LA5UKA (JO59).

Steve Bunting, M0BPQ (JO01), operated portable during NFD for the Clifton ARS and lists 42 Es contacts, of which three were on CW, the rest SSB. The countries worked were CT, EH, G, GM, I, IS0, OK, OM, S5, T9, YU, ZB and 9A. ODX was CQ3A (IM12) in Madeira at 2502km. Kevin Jackson, M0XLT (IO83), had a good month and lists lots of fine Es DX worked using 100W to a tri-band collinear antenna just 6m AGL. The most productive day was 6 July when his ODX was A45XR at 5998km. Other countries contacted included 7X, 5B, 4Z, UT, IG9 and TF plus the usual Europeans.

Robin Burrows-Ellis, M1DUD (JO02), was QRV with his 2W QRP station in the Trophy Contest on 18/19 June and made 33 contacts with stations in 11 countries in six hours of operation. Best of the list were YO3CZW (KN34) at 2008km, UR5DXX/P (KM18/1554km), 9H9H (JM75/2114km) and IG9/I2AND at 2023km.

Probably the most unusual contact of the month was made by John Fraser, GM4WJA (IO87MN), when there was a very strong aurora during the evening of 12 June. With his 7-ele wide-spaced Yagi antenna aimed at 320°, the VE8BY beacon (FP53 at 3473km) was just audible so he started calling CQ and worked some G, GI and GW stations. Then, at 2248, he was called by VE5UF (DO61OV) and they exchanged 55a/44a reports. The distance (QRB) is 6027km. The opening only lasted a few minutes, and it transpired from subsequent e-mails that John and Doug were just working stations in their own parts of the world when it occurred. At 2300 VE8BY was S9 but then dropped into the noise.

After a long absence, Derrick Dance, GM4CXP (IO85), e-mailed to report that he is now QRV again from Kelso. He runs an FT-817ND at 4W to a V2000 tri-band vertical antenna 25ft AGL and, since 31 May, he has worked 21 countries on CW and 10 on SSB. Welcome to George Bodley, MW0RZC (IO81), who, switching on at 1650 on 6 July, found the band full of DX. His contacts included LA1YKA, S51CK, SK6HD, SM0EPO, LA8WF, SM0LQB, SM6ONH, OZ2BKK, SP4TKR, OZ1SKY, OZ1DJJ, SM5CEU and finally, at 2020, TF8GX, a new country he had been trying to contact for five years.

70MHz

During NFD, M0BPQ/P found conditions average at best. They were hampered by equipment problems and Steve only lists 10 contacts. G4DEZ gave away a few points during NFD, but says he never heard so many over-driven non-linear amplifiers. One station some 200km from Bryn's location, had horrendous key clicks so he

wishes that operators would test their equipment before contests. He wonders if the VHF Contests Committee still carries out inspections during contests? Graham Wright, G4FUJ (IO81), who has entries for all five bands in the annual table, added 9A2SB (JN95) on 5 July.

Between 1830 and 2015 on 6 July, GM4CXP worked S54M* and 9A2SB*, OZ3ZW and OZ2SYV on FM and OZ2LD and OZ3ZW on SSB. These were Derrick's first overseas DX on the band on which he runs 10W to a 3-ele Yagi 12ft AGL.

144MHz

M0BPQ concludes that 2m was the star band during NFD with good tropo to the South of France and Northern Spain on the Saturday. The main operators of the Clifton ARS station were Steve and 'Jakey' Gould, G3JKY, and they completed over 320 contacts with stations in 75 grids. ODX was EA1FDI/P (IN52) at 1177km, followed by EB1EWE/P (IN53/1147km) and F/EA3EZG/P (JN02/1003km). G4APJ added a couple of new grids and countries during NFD. In an aurora on 10 July, Ken worked GM4VVX* (IO78) at 1617 and was quite pleased as he was only running low power.

G4DEZ worked G0KZG/MM in IO73 on 24 June and, on the 26th, Andy provided Bryn with four new grids, IO70, IO60, IN69 and IN79, all on SSB. On 3 July they contacted again when Andy was in JO05, another new grid. During NFD there was tropo ducting down towards the Canary Islands in which Paul Pasquet, G4RRA (IO80), contacted some EA8s. He also worked CT3BD/P, CQ3A and CT3CD all in IM12 grid. He contacted G0KZG/MM in JO15. His ODX of the year so far is RN3QR (LO00) at 3069km on 1 June, presumably via double-hop Es, when the Germans were enjoying a huge Es opening.

G8HGN gave away some points in NFD and his ODX was OL7C (JO60) at 873km. Bob was QRV in the UKAC on 5 July and made 50 contacts with stations in 15 grids and five countries ODX being DF9IC (JN48) at 657km. G8RWG hasn't been all that active on the band, but in a tropo lift on 27 June, Niels contacted DG3XA (JO43). He was also QRV in NFD when ODX was DL0HEU (JN47) at 758km. GM4CXP is finding it hard going on the band with 50W to an 8-ele Yagi 15ft AGL. Derrick is mostly on CW and his only DX of note was PA1LA* on 28 June.

430MHz

M0BPQ writes that G3GHN/P was the callsign of the Clifton ARS in NFD when tropo conditions were good. However a rotator failure meant they didn't make the most of it. G4FAA and G0DCG were the main operators and ODX was EA1FDI/P at 1177km as on 2m. A maximum of four operators was on site at any one time. G4DEZ was QRV in the UKAC on 12 July and Bryn's first contact was with an OZ. He worked a few more grids for his table score. In the UKAC on 14 June G8HGN completed 27 contacts with stations in 12 grids and four countries. Bob's ODX was DB5KN (JO31) at 467km. On 27 June, the band was open and the PI7CIS beacon was 'end stop.' He worked DL2WY (JO43), PD2EZ (JO32) and PA2JWN (JO22) in mid-evening.

DEADLINES

That's it for another busy month. The deadline for copy for November is *very* early **6 September** and for December it's **11 October**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk ♦

WEB SEARCH

WSJT update	http://pulsar.princeton.edu/~joe/K1JT/UpdateHistory.txt
WSJT V4.9.8	http://pulsar.princeton.edu/~joe/K1JT/UPD498.EXE
6m band plan	www.uksmg.org/code.htm

Note: the first two URLs are case-dependent.

HELPLINES

♦ John, G3LMR, needs a handbook or circuit for the Daystrom Heathkit Power Supply IP-20U. All expenses will be willingly refunded. G3LMR, QTHR. Tel: 0116 287 1522.

♦ Francis, G4ALD, is seeking a source of slow-motion drives, the brass barrel ball-bearing type with two fixing holes and spindles at both ends. G4ALD, QTHR. Tel: 01474 569 357.

♦ Chris, G4ZHT, needs a source of components for a valve oscillator circuit: a 600-0-600V, 3.3-0-3.3V transformer; two HV capacitors for the power supply; heavy copper wire for the inductor; HV 100pF variable capacitor; chassis and tag-boards; an amateur or small enterprise that would help design and build it. It is to be used to investigate the effect of RF current on a plasma, to try to find a stable configuration. He is willing to pay a small fee but, as he is retired, his funds are limited. G4ZHT, QTHR. E-mail: nimbo@ukonline.co.uk

♦ R J Langdon, G8GZR, would appreciate a photocopy of page 15 of the instruction manual for the Kenwood TS-830S. He has had such a manual given to him, but p15 is missing! All costs will be met. G8GZR, QTHR.

♦ Rob, G2BKZ, has a problem with the 20m band of a Sphinx transmitter. He has some circuits, but would like to know of anyone with a working model. G2BKZ, QTHR. Tel: 01438 228 720, or e-mail: rob_g2bkz@ntlworld.com

♦ Chas, AE4TP (ex-G3WYA), is looking to recapture his early days on the air with a 'Joystick' antenna, circa 1963. Would anyone who can help please contact him by e-mail to chaval@sc.rr.com?

♦ Graham, G7KYX, needs information on the B40 receiver, and a replacement 4-gang tuning capacitor. All costs willingly repaid. G7KYX, tel: 01205 871 624.

♦ Peter, G0DRT, is in the process of refurbishing a German radio which needs a replacement valve – an RES164. He is also looking for a steel case for the Canadian WS52 receiver. All expenses will be covered. G0DRT, QTHR. Tel: 01795 876 277, or e-mail: peter@g0drt.fsnet.co.uk

♦ James, G4WDI, needs a photocopy of the operator's manuals for the Yaesu / Sommerkamp FRDX-400 and FLDX-500. G4WDI, e-mail jg4wdi@btopenworld.com

♦ Keith, G0FDJ, is looking for a copy of the *RadCom* article about a QRP modification for the Alinco DX-70 from the rear ALC socket. All expenses reimbursed. G0FDJ, QTHR. Tel: 01406 380 479 (Sat/Sun) or SMS (text) 07840 294 877 (UK), or SMS (text) +31 6380 428 08 (NL).

♦ David, G3PTU, needs circuit diagrams for the DJ12E and HP8590A. G3PTU, tel: 01274 877 211.

♦ Reg, G3INU, is looking for a source of the integrated circuit MC1692L (or equivalent), as used in the Marconi TF2432 Frequency Meter. G3INU, 14 Truro Court, Canterbury Way, Stevenage SG1 4LF.

Microwave

Fancy some more output power on the 2.3GHz band? Sam describes some surplus power amplifier modules that can be modified for the band. First, the all-important band activity.

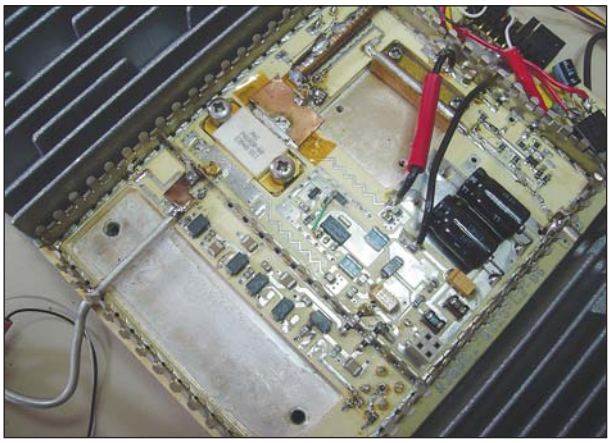
The period between May and the end of June saw mixed propagation conditions across the UK. Cold, northerly, wind flow across the UK depressed propagation in the first half of June, but then a large high-pressure system brought warm, stable weather and with it some enhanced propagation in the third week of June. Rain-scatter activity seemed to be below average for much of the early period, although the thunderstorms at the end of the hot spell helped to re-dress the balance with a large number of 10GHz rain-scatter contacts within the UK being reported on the ON4KST chat facility. This period included a significant number of contests, and the resulting contest activity saw good participation from UK stations, with many contacts between the UK and continental Europe on all bands from 1.3 to 10GHz.

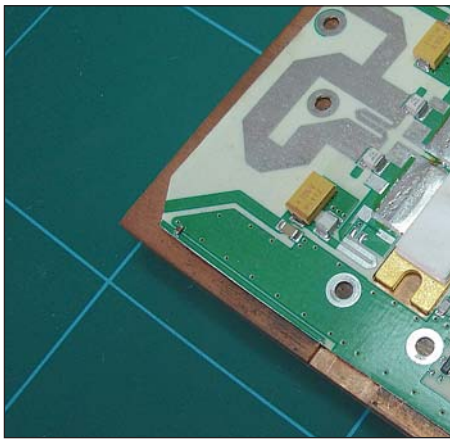
The following report from John, G3XDY (JO02), covers the microwave contest, held on the first weekend of May, which incorporates the RSGB 10GHz Trophy, RSGB 432MHz and Up contest and the IARU multi-band contest. John reports conditions during the contest to have been fairly average, with a brief period of rain-scatter on 10GHz and some aircraft-scatter on 1.3GHz, where his best contact was with SK7MW (JO65) at 861km followed by DL0GTH (JO50) at 684km. On 2.3GHz he worked DL3YEE (JO42) at 501km and GD0EMG (IO74) at 453km. It was noticeable that John's contacts on 10GHz were at much shorter range than would normally be expected. He reported PA0WMX (JO21) at 337km and PI9A (JO33) at 372km as worked.

The second 2005 Low Band contest (the first was on 24 April) took place on 5 June. The contest covered 1.3, 2.3 and 3.4GHz. From my location, activity was judged to be good during the day with many stations active in the UK and mainland Europe. The contest now partially aligns with an IARU Region 1 multi-band event, but the UK event is 11 hours in duration whilst the IARU event is a full 24 hours, with just five hours common between the two. This made it difficult for some UK stations to decide when best to operate, as early contacts with stations in the IARU event would not count for the UK event, requiring second contacts with the same station.

During the third week of June, a large high-pressure system covered the UK. This period coincided with the Nordic Activity 1.3GHz contest (NAC) on the evening of 21 June. Activity on 1.3GHz was at a high level with the ON4KST chat facility busy with operators arranging to make contacts. It was noticeable that the path from Scandinavia (particularly SM and OZ) down into Germany was working well, but contacts between the UK and Scandinavia were a little rarer, although possible. Contacts from the UK into mid- and south-Germany were much easier, although signal strengths were not as high as have been experienced on other occasions.

By way of contrast, the Microwave NAC event on 28 June coincided with warm but thundery weather, allowing stations across the UK to work into Scandinavia on the bands between 2.3 and 10GHz using tropospheric ducting propagation, and into France on 10GHz using rain-scatter. From the south and east of the UK, SM6AFV (JO57), OZ1FF (JO45), SK7MW (JO65), OZ1CTZ (JO45), SM7EAN (JO57) were all worked at reasonable signal strength by many UK stations. F6DWG (JN19) was a good signal on 10GHz rain-scatter.





Above, left to right: A Siemens GSM1900 bipolar amplifier modified to give 40W output at 2.3GHz.

A W-CDMA 120W module that can be used at 2.3GHz with minimum modification.

A Spectrian 200W MMDS amplifier suitable for use at 2.3GHz.

SURPLUS HIGH POWER AMPLIFIERS FOR THE 2.3GHz BAND

Activity on the 2.3GHz band has been at a low level for the past few years. This is starting to change with mobile phone and MMDS technology providing amateurs with a source of surplus solid state power amplifiers that can be modified for use in the amateur allocation at 2.3GHz and producing output power levels of 50W to more than 200W. Many of these amplifiers were originally used in base stations in the digital cellular radio bands at 1.8GHz, 1.9GHz and 2.1GHz. In addition to the surplus cellular amplifiers, there has recently been a quantity of high power Spectrian 2.3 to 2.4GHz MMDS solid state amplifiers and individual power amplifier modules offered on eBay.

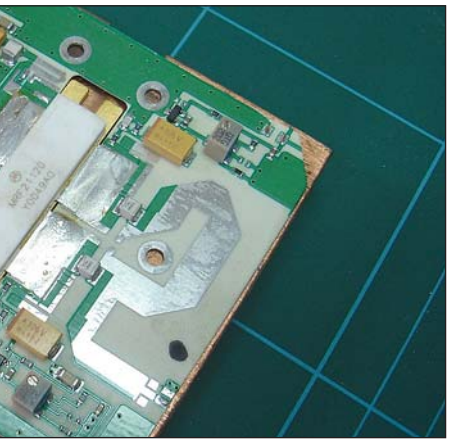
GSM digital cellular radio systems use a form of digital signal modulation known as Gaussian Medium frequency Shift Keying (GMSK). This form of modulation does not require high amplifier linearity. A basic GSM base station consists of a radio transceiver providing a transmit radio carrier with eight timeslots, each of which provides a switched voice circuit. Therefore each base station provides for up to eight voice calls on a single radio frequency. If a base station needs more capacity than eight voice channels, one (or more) transceivers are added on another radio frequency.

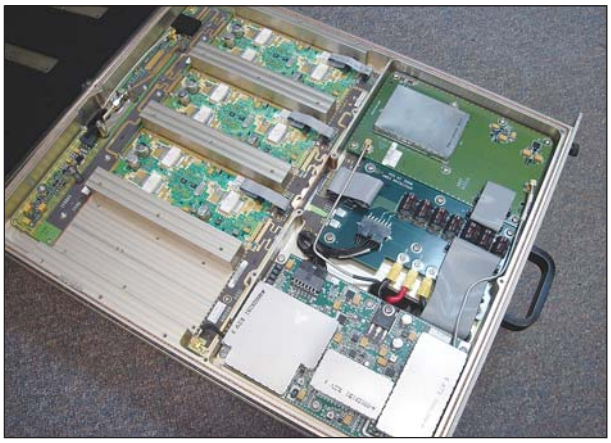
GSM base-station transmitters are sometimes combined at a moderate power level, using passive combiners, in order to use a common antenna. Alternatively, combining can be performed at much lower power levels, with the combined multiplex of two or more radio channels then amplified up to the required power level. This then requires very linear solid-state amplifiers. First-generation combining amplifiers used bipolar power transistors, operating from 26V, where they would provide a peak output power of 50 to 100W (at 960MHz) and perhaps 50W at 1800MHz. American PCS1900 (GSM) systems operate at 1.9GHz, but are otherwise similar in output power.

Radio Frequency Metal Oxide Semiconductor Field Effect Transistors (RF MOSFETs), or similar device technology, has largely replaced the bipolar transistor amplifier technology, with the advantage of better linearity, efficiency and reliability. Consequently, large numbers of the earlier bipolar amplifiers have started to appear on the surplus market. While being less than perfect for the cellular phone operators, if they can be converted to 2.3GHz, they can

Blenheim Cottage, Kirton Road, Falkenham, Ipswich IP10 0QU.

E-mail: jewell@btinternet.com
Website: www.btinternet.com/~jewell





provide a useful boost in transmit signal levels for the amateur operator.

Several years ago Günter Köllner, DL4MEA, published details on his web page showing how to modify a Siemens GSM1800 or PCS1900 amplifier module to produce up to 50W output on 2.3GHz. Siemens amplifiers were available in GSM1800 and PCS1900 versions, but were basically to a similar design, consisting of a Motorola or Philips hybrid driver module, providing typically 15W drive to a MA/COM PHI 1920-60 bipolar output stage from about 10mW input. Unfortunately, the hybrid modules have proved unusable at 2.3GHz but can be modified to give up to 15W output at 1.3GHz. See 'Web Search' for details of modifying these amplifier modules for 1.3GHz operation.

Modifying these particular Siemens bipolar amplifiers requires no more than a minor change to the input matching arrangement and the addition of a larger overlaid matching section at the transistor output. This can be seen quite clearly in the photograph. It is necessary to re-position the input and output coaxial leads and connectors with this arrangement. Full details of the modifications and tuning are shown on Günter's web page (see 'Web Search').

My own Siemens bipolar amplifier provides about 25W output for 8W drive at 2320MHz. A similar amplifier, modified by WW2R/G4FRE, provides 40W output for 10W input at 2304MHz. Both of these amplifiers are gain-limited by their respective driver amplifiers. Greater output power can be achieved with more drive as well as by combing several similar amplifiers.

The introduction of Third Generation (3G) cellular systems, operating around 2.1GHz, has required base station transmitters with excellent linearity. This high linearity has been achieved by using RF MOSFET transistors operating from a 26V supply. 3G systems use wideband spread-spectrum modulation (W-CDMA), which, when several channels are in use, has a very large peak-to-average signal level ratio (known as a large crest factor), necessitating base station amplifiers with a peak power rating of up to 10 times the mean power rating. Consequently, many 3G base stations use amplifiers with a CW rating of over 100W for 10W output.

Motorola was one of several semiconductor manufacturers producing RF MOSFET devices. They recently sold their semiconductor business, but many of the surplus amplifiers use Motorola parts. Motorola produced a very useful MRF21120 RF MOSFET power amplifier reference design for W-CDMA use that has been incorporated into some 3G base station designs that are capable of 120W CW output at 2.17GHz. The good news is that similar modules have recently appeared on the surplus market. Even better news is that they will work at 2.3GHz with little or no modification and they can provide over 100W output with about 10dB gain, which is more than enough for most amateur terrestrial operation, and probably enough for EME with a 3m, or larger, dish. Combing two or more such amplifier modules will allow in excess of 200W output. The photograph shows a typical RF MOSFET W-CDMA module.

A number of Spectrian SCPA1063W 200W Multi-point Multi-channel Distribution System (MMDS) amplifiers and modules have recently appeared on eBay. These amplifiers are, apparently, designed to work in the USA MMDS allocations between 2.3 and 2.4GHz, and have excellent linearity due to the use of X (MRF) 286 RF MOSFETS. An individual module consists of a single X286 driving a push-pull pair of the same devices. Output is usually between 70 and 80W with about 18dB gain at 1dB saturated output. A complete amplifier includes a driver amplifier with about 15W output and requiring about 10mW drive. This is ideal for connecting to the transmit output of a low-level transverter. The photograph shows the inside of one of these amplifier units where three individual output modules can be seen together with the splitter and combiner arrangement.

The NR6CA web page is the usual first stop for details of how to use the Spectrian amplifiers on 2.3GHz. Several of the Spectrian amplifiers and modules are known to be in use in the UK and elsewhere in Europe. Paul, M0EYT, and Christophe, ON4IY, both show details of their units and mounting arrangements on their respective web pages. The addresses of these sites are shown in 'Web Search'.

Maybe it's finally time to put away those old 2320MHz 2C39 cavity amplifiers?

FORTHCOMING MICROWAVE EVENTS

50th Weinheim Tagung: 10 September.
www.ukw-tagung.de/
Crawley Microwave Roundtable: 18 September.
Details from Derek Atter, G3GRO
derek.atter@btinternet.com
Microwave Update 2005: 27 – 30 October.
www.microwaveupdate.org/
Martlesham (Adastral Park) Microwave Roundtable: 12 / 13 November 2005.
Details from J Quarmby, G3XDY
g3xdy@btinternet.com

INPUT TO THE 'MICROWAVE' COLUMN

Thank you to the contributors to this issue of the 'Microwave' column. I would very much like to receive contributions from other readers as well, so that the column can give a more balanced view of activity across the UK and elsewhere. My deadline for the November issue is 31 August. Please send your input to the address at the top of the page. ♦

WEB SEARCH

DL4MEA	www.qsl.net/dl4mea/13ss/13ss.htm
Hybrid modules	http://membres.lycos.fr/f1rhr/Txatv/PA1G2mod.pdf http://web.tiscali.it/ik8uif/mhw1915.htm
NR6CA	www.nr6ca.org/spectrian.html
Nordic Activity Contest rules	www.qsl.net/oz7cq/nacrules.html
M0EYT	http://pjm.dyndns.org/hamradio/2.3ghz/
ON4IY	www.qsl.net/on4iy

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Antennas

G3LDO explains in detail the use of the three-meter method of impedance measurement

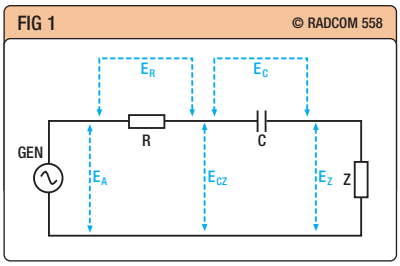
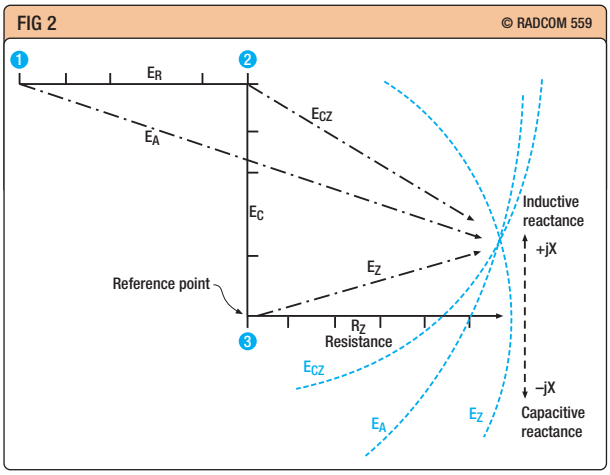


Fig 1
Block diagram of 3M Z bridge showing the voltage measurement points.

Fig 2
Method of determining impedance from measured voltages.



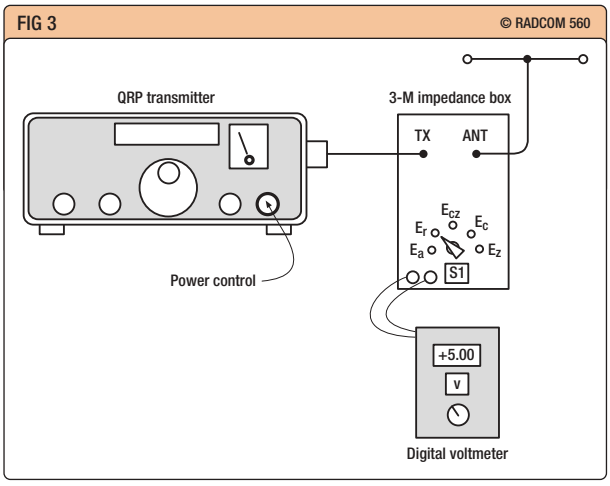


Fig 3
Three-meter test bridge, transmitter and digital voltmeter connections for antenna impedance measurements.

My 3M impedance measurement bridge showing its simplicity. This model, built in 1970, is still going strong.

The discussion on the three-meter impedance instrument and the *BASIC* program for converting the scalar voltage measurements to impedance created much interest. This method of measuring impedance was first described in [1] way back in 1965. I made my first three-meter instrument in 1970 and used it extensively using the prescribed method of converting the voltage readings to impedance with the graphic method described below. At the time, the only instrument for measuring impedance in use by amateurs (those not able to lay their hands on a commercial bridge) was the noise bridge, the design of which, in those days, allowed only the measurement of the resistive component of impedance. The three-meter instrument was also described in *RadCom* in 1987 [2].

I have been asked to give some information on how this method works. This is necessarily brief. The method compares the unknown impedance with a fixed standard impedance and the ratio is indicated by voltmeter readings. The fixed standard impedance comprises a resistor and capacitor as shown in **Fig 1**. Although called the three-meter method in [1], in actual fact two additional readings are required, making five in all. One of the additional readings allows in place calibration of the reference capacitor (line Ec in **Fig 2**) and the second permits several solutions for the unknown impedance, thus giving an indication of the random errors that may be present in the data.

An RF excitation voltage, at the measurement frequency, is applied to Z via R and C. The voltages across R and C are measured, together with the input voltage, Ea, the voltage across Z, and the voltage across Z, plus C. The excitation level is adjusted until Er = 5V, then all the other voltages are measured.

The RF voltages are measured using diode probes, selected by a switch. These probes measure peak volts and require a high impedance voltmeter; a digital voltmeter is ideal. The full circuit was shown in Fig 1 of July 'Antennas'. The impedance value can be derived from the voltage using a graphic method shown in Fig 2. Each voltage is plotted on graph paper using compasses and a ruler. Two of the voltages determine the reference points for the pivot points of the radii of three arcs the lengths of which are proportional to this voltage (vectors). Impedance is identified as the point where the three arcs intersect.

For greatest accuracy, the value of R and the value of C need to be appropriate to the ranges of impedance and frequency of the measurements being made. For example, most measurements are made using 50Ω impedance coaxial cable, on one or more of the amateur bands. R can be 50Ω and C to a reactance of 50Ω. In practice, a reactance value for C of between 25Ω and 100Ω will give reasonable results, although highest accuracy will result if the reactance of C is near to 50Ω.

A low-power transmitter with a variable power output can be used as an excitation source. It is very important that the harmonic output from the excitation source is kept as low as possible; if your results are inconclusive, this may be the cause

An attenuator is used at the input, so the transmitter is isolated from the variations of unknown impedance as the transmitter frequency is varied during a series of measurements.

Power stability of the excitation source is also important ie that Er remains constant while the other parameters are being measured.

USING THE 3M Z BRIDGE

Connect the unknown impedance, excitation source and digital voltmeter to the three-meter test bridge as shown in **Fig 3**.

- Set the switch to read Er.
- Set the transmitter to the lowest power level and switch on.
- Increase the power until the voltmeter reads 5V; record this on a note pad as 50.
- Note the voltages at the other switch positions, (12V being recorded as 120 and 6.3V as 63, etc); then check the stability of the transmitter power output by checking position Er again. The readings should be repeated if the excitation level has drifted more than about 0.1V.

The graphic method of extracting impedance from the voltage readings is as follows:

On a sheet of linear graph paper (refer to **Fig 2**) -

- Draw a horizontal line, the length of which is equal to Er.
- Draw a vertical line down from the right-hand side of line Er, the length of which is equal to Ec.
- Place the point of the compasses on (1) and draw an arc, the radius of which is equal to Ea. Repeat (2) and (3) for radius values Ecz and Ez respectively.
- Mark the point at which the arcs intersect. An exact intersection of all three arcs is not always possible due to the errors in the data.

A horizontal line from the reference point to the arc intersection gives the resistive value of impedance. A vertical displacement up or down from the resistive line gives the value of the inductive or capacitive reactance, respectively. If the arcs do not intersect, take the centre of the triangle (known as a cocked hat) formed by the non-intersecting arcs as the impedance point.

A special chart, shown in **Fig 4**, and available in [5], projects the plotted reading directly on to an impedance chart.

COMPUTER PROGRAMS

I bought my first computer, a BBC 'A' model (with its 16K of memory!), in 1984. It was obvious that the packaged *BASIC* language was capable of running a program, but I needed help to achieve this. The late Tom Lloyd, G3TML, came to my rescue with a mathematical solution that could be converted into a *BASIC* program and we published the results in *QEX,* in late 1987 [3]. There followed a lot of correspondence in subsequent issues of *QEX*, some pointing out errors and one suggestion that there was a more simple and rigorous solution than the trigonometrical approach. G3TML stuck to the trigonometrical method because it could indicate the inevitable measurement errors. His reasons for doing this are described in [3] and [4].

Later work, described in [5], [7] and [8], used Microsoft *GWBASIC* or *QBASIC* because of their more widespread use. These programs are slightly more complicated because neither supports the inverse sine function.

As a result of my described difficulties with *Excel* ('Antennas', July 2005) many of you sent programs and suggestions of other solutions too numerous to describe here, which I appreciate and found interesting. Dave Roberts, G8KBB, and Dave Murray, G8GTR, sent me *Excel* programs that gave the correct results. G8KBB notes "Attached is an *Excel* spreadsheet that does the same as the *BASIC* program. It is not particularly efficient - I just wanted to show a close correlation to the original. The main changes are to the lines 180 - 210 where I combined slightly and used the Excel IF construct and in the output routines that do not need to convert - you just ask Excel to format the cells appropriately". G8GTR's program contained a graphic similar to that shown in Fig 2.

All *BASIC* programs described in [4] and later were extended to assess errors, similar to placing a mark in the centre of a 'cocked hat' in the graphic method and producing an estimate of the errors. A further program was introduced to modify the data automatically in the event of a non-intersection as shown in **Table 1**. I also found it useful to save batches of measurements to a file so that they could be used to create impedance signatures of antennas as a table or in a graphical form. Impedance measurements of a length of mis-matched feeder is a useful method of impedance bridge calibration as shown in **Fig 5**.

I expect to have more details of the three-meter impedance-measuring method on my website [9] by the time this column appears. It will contain as much source code as I can get together. ♦

REFERENCES

[1] 'Measurement of R + jX', D Strandlund, W8CGD, *QST*, June 1965.
[2] 'Measurement of Antenna Resistance and Reactance', J Bazley, G3HCT, *Radio Communication*, June 1987.
[3] 'Measurement of Antenna Impedance', P Dodd, G3LDO & T Lloyd, G3TML, *QEX*, November 1987.
[4] *The Antenna Experimenter's Guide, 1st Edition*, P Dodd, G3LDO.
[5] *The Antenna Experimenter's Guide, 2nd Edition*, P Dodd, G3LDO, available from the RSGB Bookshop.
[6] 'Correspondence', *QEX*, August 1988.
[7] 'Measuring RF Impedance Using the Three-Meter Method and a Computer', P Dodd, G3LDO, *The ARRL Antenna Compendium, Vol 4.*
[8] 'More on the Three-Meter Impedance Measuring Bridge', P Dodd, G3LDO, *The ARRL Antenna Compendium, Vol 5.*
[9] http://web.ukonline/g3ldo

Fig 4
A special chart allows the voltmeter readings to be plotted reading directly on an impedance chart. A full-size version is included in [5].

Fig 5
Graphical measurements of a length of mis-matched feeder is a useful method of impedance bridge calibration

Table 1
The print-out of a program which automatically modifies data in the event of a non-intersection.

FIG 4 © RADCOM 561

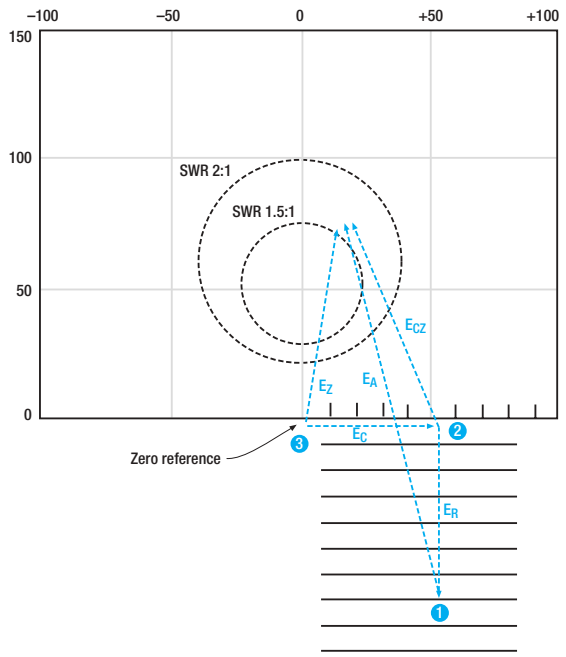


FIG 5 © RADCOM 562

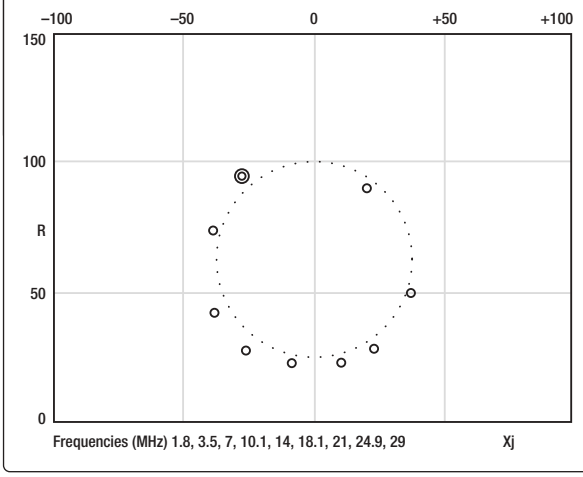


TABLE 1

Ez (E) 56

If there is more than one line of data below then the data has been corrected. Last line indicates corrected data used to determine impedance.

```
Ea (A) = 98 , Ecz (C) = 45 , Ec (D) = 50 , Ez (E) = 56
Ea (A) = 98 , Ecz (C) = 46 , Ec (D) = 50 , Ez (E) = 56
Ea (A) = 98 , Ecz (C) = 47 , Ec (D) = 50 , Ez (E) = 56
Ea (A) = 98 , Ecz (C) = 48 , Ec (D) = 50 , Ez (E) = 56

Solution
 Resistance  46.4
 Reactance +38.3

 Errors
  R =  (+/−)  1.6
  X =  (+/−) 11.7
Go to  Main <enu 1. Repeat this program 2. ?
```

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E-mail: g3zvw@talktalk.net

Whatever next

It's feedback time, with questions raised and responses about items from the last few months ♦ The first of the manufacturers gives feedback on the 'next generation'

The subject of 'Broadband in Gas' technology, which I brought to readers' attention in July, resulted in a number of questions. Vic Ludlow, G3JLZ, was "bemused by the idea of high-capacity (*not* broadband) Internet signals being propagated either within the gas in alkathene gas pipes, or perhaps being launched along a waveguide formed by a metal gas pipe". As he explained, "I taught waveguide theory and applications for some years - I can't see an *ad hoc* arrangement of copper piping and assorted joints working at all well - think of the standing waves and the losses!" I agree wholeheartedly, but clearly this technology does not rely on the usual desire of trying to deliver the maximum amount of RF at the far end of the waveguide. If I was to put 1W into a waveguide that was going to feed a dish but only managed to deliver 1µW at the other end, I'd be far from satisfied with the results, but here we are not talking about feeding an antenna, just a detector in the pipe itself. If 1W was go in and 1µW arrive at the far end (a 60dB loss), that could be enough for the system to operate.

But it wasn't just the (inevitably) huge amount of attenuation that readers were interested in, the material used for modern gas piping in Britain also raised questions. Roy Read wrote and made almost exactly the same point as G3JLZ when he said "…much gas piping in the UK is now made of alkathene or a similar plastic, certainly on the trunk routes and, increasingly, to the home. Will that act as a dielectric waveguide?". The short answer is that I don't know, and no information seems to be available at present, but what I would say is that even if alkathene (or other plastic) pipe is completely transparent to RF, the ground in which it is run isn't. I would readily agree that a plastic pipe surrounded by soil wouldn't make a particularly efficient waveguide, but efficiency isn't the issue. As long as the detector at the customer end is also underground and blocks RF from appearing above the ground, it shouldn't matter.

Back to Roy Read, who asked "How close to the user must the signal be injected?" Here I can give an answer, because – as I said in July – 'BiG' is intended to deliver across 'the last mile', not through the national network of gas pipes.

I will leave it to G3JLZ to sum-up for now. He said "I will be interested to learn more about the proposed scheme, as you will." Indeed I will!

THE NEXT GENERATION – MANUFACTURER FEEDBACK BEGINS

Subsequent to preparing the text for *RadCom* that gave details of final part of the design, I e-mailed all five parts as one document to Icom, Kenwood, MFJ, Yaesu, Nevada (the official importer of Alinco equipment) and AOR (the official importer of Ten-Tec equipment). They were all interested and where appropriate have forwarded the message to higher authority for comment.

The first response came from David Wilkins of Kenwood. It was comprehensive, so I will present part of it this month and remainder in October. He said: "There are a lot of very good and well thought-out ideas proposed. Some we have already implemented – others are an excellent 'wish list' for our designers.

"I'd like to take the opportunity to comment on a few of the headline ideas (but any not mentioned have still been read and understood!) and to give you the 'devil's advocate' view.

"Plug-in 200W amplifier: Since most of the rest of the 100W rig would need to be beefed-up to 200W ratings anyway, I doubt that a module would be economic. A 100W internal ATU wouldn't cope with 200W, so either the module would need its own ATU (getting very expensive) or the customers buying the 100W version will be paying a premium for higher rated components they aren't going to use. We have recently launched the TS-480, which is available in 100W and 200W versions. If the rig was bigger I'd imagine that we would have just gone for the 200W, since that can of course be varied from 200W down to 5W anyway. And the high-power version only costs about £100 more than the lower power one – there's no way that a module would be anywhere near that low a cost.

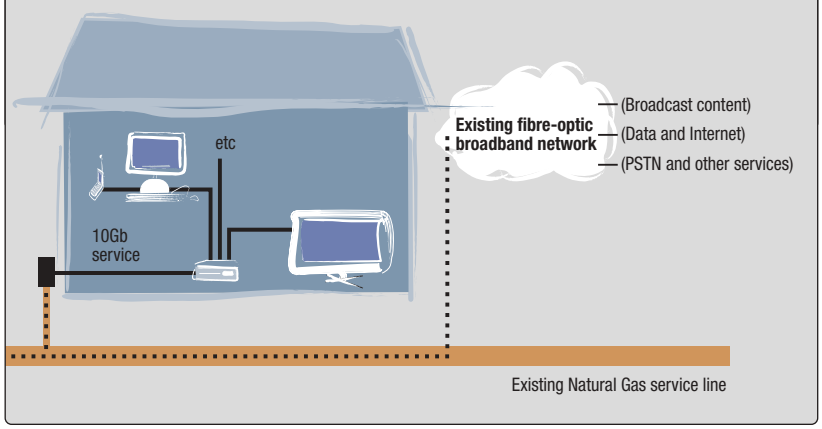
"Cooling fan: A bolt-on heatsink would need to work effectively in all world markets – especially those where the ambient temperature may be 35°C+, rather that the typical British summer 20°C. And work on RTTY, FM, SSTV and other high-duty cycle modes. I'd be interested to see some test results on how big a heatsink would be needed for 100% reliable operation though.

"QRP: Yes – agree totally. As long as we can get a PA that runs within parameters all the way from 1W to 100W and from top band to 6m then I'd like to see this. I doubt we could get even lower power levels though without special (ie expensive) devices."

Auto ATU. These days, it's more economic to build in the ATU (for those that do want to use it) and let those who don't want it switch it in or out as required.

More next month. ♦

FIG 1 © RADCOM 516



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In practice

Restoring failing keypads ♦ Reliability of wirewound resistors

RESTORING FAILING KEYPADS

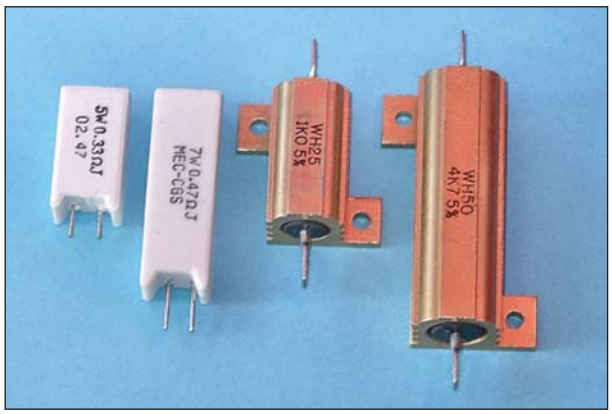
Q ***How can I repair an old keypad that has become unreliable?***

A These days, almost everything electrical is controlled by push-buttons. Unfortunately, the button contacts are often the components that fail first, making the controls unreliable, and eventually making the whole thing unusable. The rule seems to be that push-buttons can be small, cheap or reliable – you can choose any *two* of these, but you can't have all three together. It seems such a shame to throw away a perfectly functional piece of equipment, merely because it is 'trapped' behind an unreliable push-button keypad. So what can we do about it?

There are countless types of push-button switch, but they fall into two major groups. Each type has its own repair and restoration methods.

Individual switches are found in older equipment, and also in physically-large items where the switches are widely separated. Typical examples are computer keyboards, and control boards for large consumer products such as washing machines where closely-spaced keys would be inconvenient. In such cases you generally find a large PC board with individual switches soldered on. Almost invariably, one or two of the most-used switches become unreliable first – so the quick and dirty repair is to swap those switches for others that are seldom used. For example, the spacebar switch on a computer keyboard is often the first to fail. If you catch this early, eg when you first start to notice multiple spaces due to contact bounce, you can 'retire' that switch to a much less demanding location such as Scroll Lock or Pause/Break (which I'll bet you've hardly ever used). At your leisure, you can then search the major component catalogues such as Farnell, RS and CPC to try to find permanent replacements [1].

High-quality computer keyboards generally use capacitive or Hall-effect switches that have no moving contacts, and these tend to remain reliable until they wear out mechanically. Each switch also has its own individual spring mechanism, and switches for keyboards also have some kind of 'snap' mechanism to give better feedback to the fingers. Many laptop keyboards and control panels may use sub-miniature switches that do not have very strong springs, so there may be a separate spring mechanism. You might have difficulty in repairing the mechanism, although the miniature SMD switches are often standard components that can be found in the major catalogues [1].



Aluminium-clad and ceramic-bodied wirewound resistors.

But before you start replacing switches, read what happened recently to our washing machine. The push-button controls became increasingly unreliable, to the point where none of the buttons worked and the machine was totally unusable. The control panel was an assembly at the front of the machine, while the main logic unit was deeper inside, so the first suspect was the connector and cable between the two... but it wasn't that. The next step was to remove the sub-panel that carried the push-button plungers and spring mechanisms, to get at the control board itself. This turned out to be a typical modern surface-mount PC board with a number of sub-miniature switches, the LED display and a number of support ICs. The switches were standard components, easily identifiable in the Farnell catalogue [1] and easy enough to replace... but hang on a minute: some buttons were used much more than others, yet they all became unreliable within a month or two. Thinking about it a bit harder, it seemed increasingly likely that all the switches were perfectly OK, and that the fault was somewhere else.

Sure enough, when the control board was carefully supported so that the machine could be powered-up and the buttons operated with an insulating rod, everything worked perfectly. And after I had put it all back together, our washing machine has worked perfectly ever since.

So what had been wrong with it? The answer became clear as soon as I had carefully reassembled the control panel. The control buttons now had a smooth feel and a distinct click that they'd never had before – not even from new. The sub-panel that carried the large buttons had been assembled slightly out of place, and after a few years of vibration the panel had migrated even further sideways, so that eventually all the buttons were binding. The moral of this story is that sometimes a switch can appear to fail when there's nothing electrically wrong.

Integrated keypad switches are typically found in small equipment where the keys are closely-spaced. Although there are separate push-buttons, the entire keypad forms a single structure so there are no replaceable parts. Therefore an integrated keypad has to be repaired in a different way. **Fig 1(a)** shows a very basic membrane keypad where the moving contacts are flexible copper tracks etched on the underside of a plastic membrane, while the fixed contacts are etched on the main PC board. These keypads are very simple and cheap to make, because they can be 'printed' in a variety of shapes, sizes and electrical configurations. In their simplest form, the switches have no mechanical feedback at all, so there is often a dome-shaped spring above each set of contacts to provide a snap action (**Fig 1(b)**). Obviously, this type of construction is suitable only for low voltages and currents. The switch contacts are very vulnerable to even tiny amounts of corrosion or dirt, because there is no wiping action that might help the contacts to clean themselves. Sometimes you can dismantle these keypads and clean

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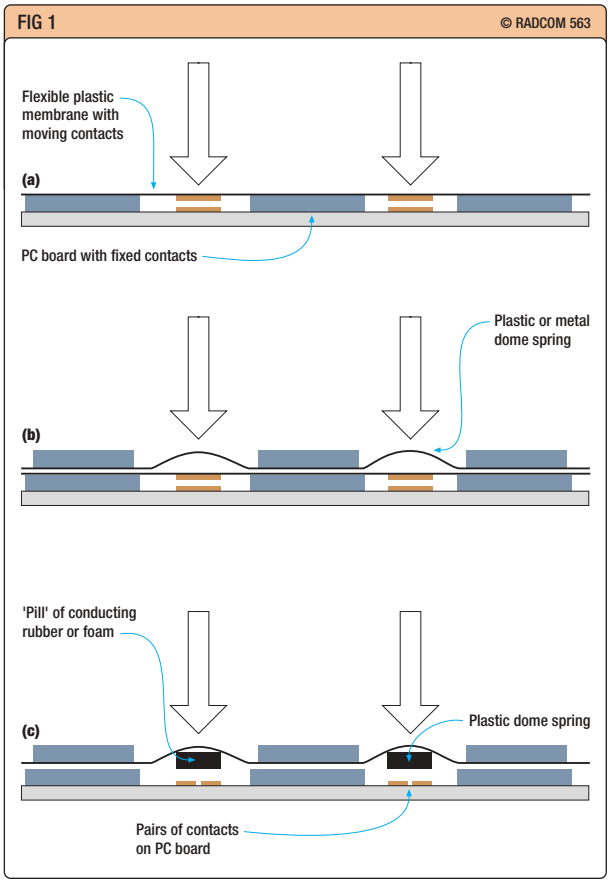
the contact surfaces – but use a proprietary switch cleaning fluid that has been formulated for the job, and apply it sparingly with a cotton bud and only moderate pressure. Do *not* use WD-40 or the like (it is not intended as a switch cleaner) and do *not* use severe abrasives that remove any contact plating. Bright bare copper will work for a short time, but it will soon tarnish and stop working forever.

Fig 1(c) shows an alternative type of construction, in which a plastic membrane carries small 'pills' of conductive rubber or foam that bridge between pairs of contacts on the PC board. Again some kind of dome spring may be used to provide a snap action. The problem with these switches is that, with time and repeated compression, the conductive material will crumble away. And the harder you have to press the buttons, the more it will crumble, incidentally scattering little bits of conductive material across the rest of the keypad.

Mike Hill, G4KUY, has now found a good way to repair keypads of this type. He used small pieces of 'Quantum Tunnelling Composite', which is a novel kind of plastic that changes from a near-perfect insulator to almost a short-circuit when compressed. This QTC material is sold by Maplin as small 'pills' of 3.6mm square by 1.0mm thick [1]. To repair his old Alinco DJ-580, Mike cut away what was left of the original conductive rubber pad from its silicone rubber backing at each location on the keypad, and then trimmed a QTC pill to fit in the recess where the pad had been (similar to Fig 1(c)). In the DJ-580 it was not necessary to glue the QTC pills, as they are held in place when the keypad is reassembled. Unlike the original conductive rubber, it doesn't matter if the QTC pills are touching the pairs of contacts on the PCB, because this material does not begin to conduct until it is compressed. Mike reports that he doesn't have to push the buttons much harder than before, and certainly less hard than when the original keys were starting to fail. This QTC material is quite expensive at £1.99 for four tiny pills, but it could make the difference between having a working rig and having to throw it away.

Fig 1:
(a) Basic membrane keypad, with moving contacts on membrane.
(b) Domed spring sheet provides a snap action.
(c) Alternative construction, using conducting rubber or foam to bridge pairs of contacts on main PC board.



WIREWOUND RESISTORS

In the July column, I promised to say more about wirewound resistors and their reliability problems.

Wirewound resistors are used for power applications, and consist of a spiral of resistance wire, wound on a ceramic former to permit high-temperature operation. The reliability problems of wirewound resistors are mainly related to the fact that any small reduction in cross-section of the wire will result in a hot-spot, which gradually becomes worse and may cause the wire to burn out. Hot-spots are also more likely to occur if the wire is exposed to oxidation. For reliability, it is best to under-run wirewound resistors quite significantly in terms of power rating, and preferably to use the more expensive components with a vitreous (glass) enamel coating over the wire, for example the green Welwyn W21-24 (3 – 14W) series. These resistors are more reliable than most other types of wirewound, because the wire is completely sealed against oxidation. However, they do run very hot, so they need to be mounted on tag-strips or insulating pillars, in a location where there is free circulation of air.

Because tag-strip construction is very rare these days, wire-ended power resistors have increasingly been replaced by the more modern cement-bodied and aluminium-bodied types. The cement-bodied resistors are designed to fit into PC boards, and the aluminium-bodied ones bolt down to the chassis and create a pair of handy wiring terminals. However, both types use organic insulating materials that can swell and burn up if overheated. This gives both types of resistors a rather poor tolerance to short-term overloads that ceramic/enamel resistors can handle quite well. A severe short-term overload may cause the cement-bodied resistors to split open, while the aluminium-bodied type tend to expel their insides from the metal housing – accompanied by a short-circuit to chassis. It is easy to be over-impressed by the power ratings of the aluminium-bodied power resistors. Like power transistors, those ratings are utterly dependent on the quality of the heat-sink. You also need to check the voltage ratings. Only the resistors rated at 15W or more can handle 230VAC mains voltage, and because the insulation is organic (epoxy) it can also deteriorate with temperature and time.

In conclusion, both the cement-bodied and aluminium-bodied wirewound resistors are fine if they are treated kindly, but they do need some care in use. ♦

REFERENCES

[1] Follow the links from the 'In Practice' website.

Pat Hawker, G3VA

37 Dovercourt Road, London SE22 8SS.

TT

Binaural cocktail parties ♦ Low-cost huff & puff stabilised VFO ♦ Valve diode mixers & product detectors ♦ G3DXZ's ceramic resonator VXO

BINAURAL COCKTAIL PARTIES

A *New Scientist* feature by Robert Adler 'Are We On Our Way Back to the Dark Ages?' (2 July 2005, pp26 – 27) discusses the controversial views of Jonathan Huebner of the US Naval Air Warfare Center that, far from enjoying a golden age of human inventiveness, we are fast approaching a new dark age. It is his belief that the rate of technological innovation reached a peak a century ago. Significant breakthroughs flourished between about 1873 and 1915 but have been declining ever since.

This is clearly an unfashionable view. Many futurologists say technology is developing at exponential rates. Nano-technology offers, they say, a fantastic future. Far be it from me to judge between these diametrically-opposite views, but I cannot help feeling that many of what are claimed as new developments in radio communication often represent primarily the utilisation of ever smaller devices in new implementations of ideas, concepts and circuits originally developed many years ago; some stretching back to the thermionic era and even (for antennas) to the Age of Spark.

The *RadCom,* July 2005, pp78 – 83, article 'The Buccaneer', by Phil Harman, VK6APH, and Steve Ireland, VK6VZ, presented a convincing implementation and endorsement of the value of binaural or pseudo-stereo reception of CW signals. It drew attention to the section dedicated to this technique in the excellent ARRL book *Experimental Methods in RF Design*, by Wes Hayward, W7ZOI, Rick Campbell, KK7B, and Bob Larkin, W7PUA. In turn, the book draws on KK7B's article 'A Binaural I-Q Receiver' (*QST,* March 1999, pp44 – 48), with full constructional details of the 'Binaural Weekender'. Of this receiver, an editorial endorsement by Ed Hare, W1RFI, ARRL Lab Supervisor, runs "Once my ears got used to the effect, they had to drag me away from this radio. This is one I gotta have!" **Fig 1** shows the basis of the KK7B binaural I-Q receiver as used also for the Buccaneer.

I cannot resist a wry smile. Some 30-odd years ago, in several items headed 'The cocktail party effect', I drew attention to the potential value of pseudo-stereo reception of CW signals and, in October 1973, revealed for the first time the pioneering work on this technique by F J H ('Dud') Charman, G6CJ. Earlier (August 1973) I had drawn attention to a CCIR investigation into a novel, switchable synchronous (exalted-carrier) binaural detector for AM broadcast receivers that offered greatly improved performance over conventional detectors. Also noted then was a performance improvement and a 'frequency scissors' detector that had been developed in 1958 by Hans Ever, PA0CX, that split the upper and lower sidebands of AM or CW signals and fed them to separate earpieces.

To quote from introductory remarks in the August 1973 'TT': "The human ear can provide a 'filter' bandwidth of around 50Hz with a remarkably large dynamic range (well over 100dB) and the ability to tune from about 200 to over 1000Hz and all without introducing 'ringing'. With such good 'no-cost' filters, the degree of improvement provided by additional electronic filters is limited.

"This naturally raises a further question: are there not other ways in which we could use our ears to better advantage in eliminating signals we do not want to hear? Which bring us, as you may have guessed, to the so-called 'cocktail party' effect. This has been described (for example, in the book *Correlation Techniques* by F H Lange) as follows: 'If a large number of people are in conversation with one another in one room, it should in general be impossible to carry on a conversation with someone even in the immediate vicinity. Nevertheless, experience teaches us that this raises no great difficulty – in fact quite the reverse provided that the listener is 'tuned in' to the partner and the subject of conversations. This implies, therefore, the existence of a tuning (modulation) mechanism in the human ear, certainly of another kind to that used in radio receivers, since all conversations are using the same frequency range… the human ear achieves more than all the methods of analysis hitherto known… Classical filter theory with its band-pass and rejection bands breaks down here.' Undoubtedly, one of the ways in which we can separate wanted and unwanted signals is by means of apparent differences of direction, making use of the fact that we have two ears rather than one. Stereo and more recently quadraphony are examples of how we can take advantage of the spatial characteristics of our ears. But, in communications, we are normally interested in what can be done with only one channel."

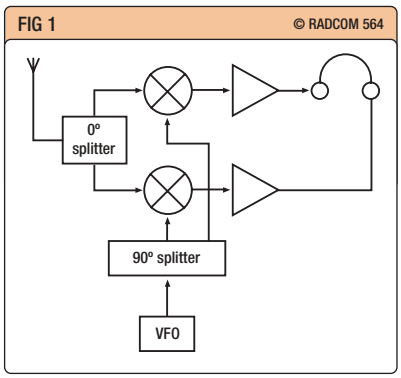


Fig1: Block diagram of an I-Q binaural receiver that allows the ear-brain combination to process the detector output resulting in stereo-like reception. As used by KK7B for 'The Mountaineer' (*QST*, March 1999)

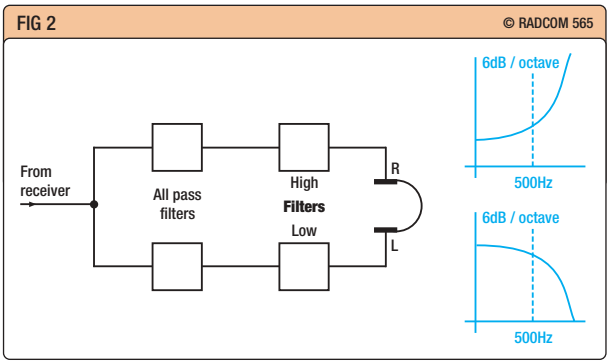


Fig 2 G3OTK's suggested method of providing a 'stereo' effect for CW reception using AF processing ('TT' August 1973).

The item also included a suggestion by Richard Harrison, G3OTK, for providing a 'stereo' effect to provide subjective selectivity on CW: **Fig 2**.

This was followed up in the October 1973, 'TT'. To quote: "What we did not know at the time was the pioneering and extensive work in the field of CW subjective selectivity by F J H 'Dud' Charman, G6CJ, and the clear priority established by him in British Patent No 916,843 'Improvements Relating to Radio Telegraph Receivers'. This patent, now expired, was taken out by EMI (formal application date 24 January 1958) naming G6CJ as the inventor… It remains essential reading, describing the arrangements necessary to assist a radio operator to separate wanted CW signals from unwanted transmissions around the same frequency by means of 'psychological or subjective' effects. In practice, these arrangements –which have been used by G6CJ over many years – provide exactly the facilities sought by G3OTK, although they differ in the sense that G6CJ is

FIG 3 © RADCOM 566

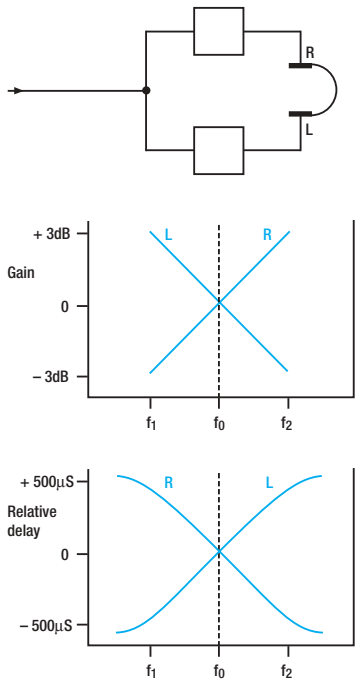


Fig 3
Gain and delay dispersion as used in the G6CJ / G3OTK 'Stereocode Processor' (*Radio Communication*, September 1975)

Fig 4
G0UPL's two-chip VFO plus Huff & Puff stabiliser (*Sprat*, Spring 2005).

convinced that the stereo effect is achieved by minute time delays rather than phase differences: **Fig 3**.

I continued: "How has it come about that this most interesting and valuable work has remained little known over the years? Well, Dud hinted at the possibilities in his lecture 'The Human Machine as a Radio Operator' in January 1958 – though he frankly admits that quite deliberately he has never described his work in any detail except in the patent application. He says: Well, it's nice to have a private secret, especially in competitive amateur radio operating – but really I was aware of the placebo pitfall of psychology and wanted first to get a proper statistical test done, using operators who did not know what was going on, and once it was widely known this would be impossible. The patent was taken out not for financial gain, but rather to establish priority of the work..."

G6CJ suggested that it was by now evident that we are extremely good at detecting incredibly small differences of *time of arrival* of sounds at our two ears: times so short that it must be done virtually at molecular level. The cocktail party effect thus depends partly on time delays, but also makes use of all other features of the signals, including amplitude, waveforms, room echo and the like.

The 1973 item continued: "Recent work on stereo has brought to light a good deal of fresh information. It is already possible to take a pair of loudspeakers, provide them with identical inputs and then insert effects that make the sound 'walk around' in imitation stereo, successfully fooling the hearing mechanism (if this experiment is repeated with continuous tones, varying only the phase, nothing unusual will be observed). It seems that essentially the ears work on starts and stops (the musician's *attack*) so that Morse code is an almost ideal medium for achieving pseudo stereo selectivity.

"G6CJ recalls how, as long ago as 1925, he was working with phones on a bridge system with two nearly identical 1000Hz inputs, when all of a sudden the beat note between them began wobbling about inside his head. The effect was so startling that the memory persisted although it was many years before a reference in the classic book by Fletcher began to set him wondering whether this effect could possibly be used to turn the output of a receiver into a stereo presentation.

"This was in the mid-30s when, at EMI, G6CJ was working with such people as Blumlein, the father of modern stereo recording. Unfortunately, he never put his ideas to Blumlein, who was later tragically killed during the war while working on airborne radar. Fletcher had shown that the relative time delay for a 'side' signal was about 0.6ms and that there would be an amplitude difference of about 1dB when a signal goes round the outside of the head. It seemed feasible to establish such conditions artificially, but this needed networks of a type then little understood even by the experts in this field.

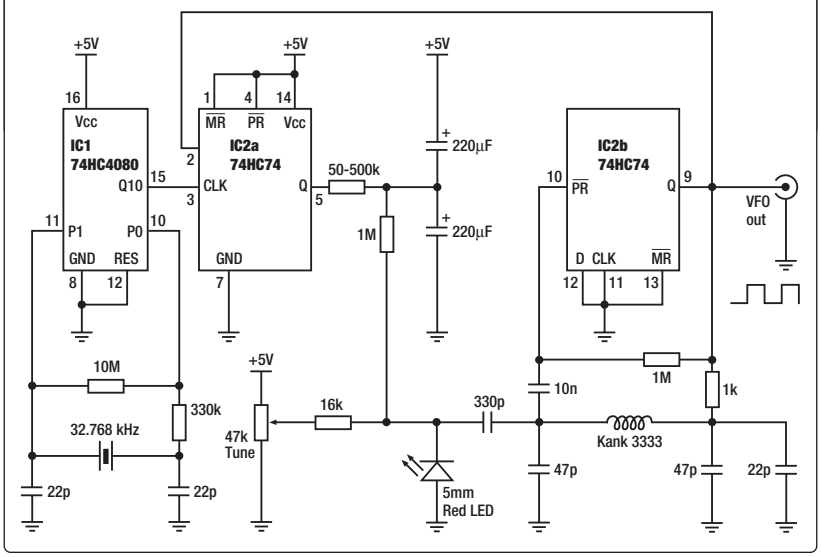
"By 1945, 'Dud' had made a model using filters with m > 1.0 to get delay differentials, but it was not very satisfactory in spite of being frightfully difficult to realise. However, he then discovered the 'all-pass' network and by 1951 had a two-channel amplifier with a delay cross-over at 700Hz. 'As soon as I put it on the air I knew I was home – though aware that a psychologist would jump in and say – Ah, but you wanted it to work that way, so you haven't proved anything. But I discovered that not only could I concentrate on the signal tuned to the centre (ie the crossover frequency) but also if, for example, a rare callsign turned up on the 'edge' so to speak, I could immediately switch my attention to it."

G6CJ provided an outline of his experimental box of tricks as provided in his Patent 916,843 and this was reproduced in the 1973 'TT' item. He used some 10 valves (six in cascade) giving severe stability problems, an expensive collection of LA3 cores, and problems with decoupling which produced its own brand of delay distortion. However, in the end it did what was intended, providing about a millisecond per octave delay. The original valved unit was used operationally and successfully at G6CJ over a number of years, but a later solid-state design was never completed as it was abandoned when G6CJ began to suffer a hearing loss in one ear.

However the publication of the two 1973 items in 'TT' brought G6CJ in touch with G3OTK and, between them, a solid-state design emerged. The principles and practice of 'stereo' reception of CW signals was extensive described in 'Subjective Selectivity and Stereocode', by F Charman, G6CJ, and R Harris, G3OTK (*Radio Communication*, September 1975, pp674 – 681, with additional notes in January 1976, p23). This included full constructional information on a solid-state stereocode processor using eight integrated circuits, including all-pass filters based on operational amplifiers. For a time, a complete kit of parts was marketed.

Since then, a number of articles on pseudo-stereo has appeared, although the pioneering work of G6CJ seems generally to have passed unnoticed. However, as a result of my referring briefly to the 1975 article in 'TT' in February 2001, I received some comment from Peter Montnéymery, SM7CMY, who had been encouraged to complete the stereocode processor

FIG 4 © RADCOM 567



that he had begun in the past. He found that while use of the processor did not *per se* improve recognition, it was more pleasant to listen to CW using the stereo adapter and it results in less fatigue.

He also enclosed his 120-page book *Signal Detection in Noise with Special Reference to Telegraphy*, published in 1994, based on his medical thesis in support of a doctorate at the Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital, Lund, Sweden. His main conclusions, not unsurprisingly, was as he summarised in his letter, that: "(1) the ability to recognise telegraphy masked by noise decreases with increasing telegraphy speed; (2) a low frequency 500 – 700Hz improves recognition; (3) best recognition is obtained with the telegraph signals 180° out-of-phase between the ears, but with the noise 'in-phase' (unfortunately impossible in practical receiver design, as far as I know); (4) a human telegraph operator outperforms the electronic decoders. (This was all before PSK31. On the other hand, I understand PSK31 is more a visual proceeding than an aural proceeding)."

In 'TT' July 1989, I drew attention to some limitations of the human ear in rejecting closely adjacent signals due to the phenomenon 'Zwicker masking'. In his 1967 book on the ear as a receiver of information he showed that there exist, between 30Hz and 20kHz, 24 sub-bands within which the most powerful component conceals (masks) adjacent, less powerful components, including noise, making them imperceptible to the ear. The width of these sub-bands varies from 100Hz in the low-frequency domain up to 2kHz in the high-frequency domain. While this effect became important in the field of digital sound recording and bit-rate reduction, It explains why our ears alone cannot filter out or even detect a weak wanted CW signal if there is at the same instant a more powerful interfering signal *within the same sub-band*, even though, in other circumstances, our ears may have a nominal selectivity of the order of 50Hz. This is another reason that should encourage the reception of CW signals with a beat frequency not greater than 700Hz and preferably between 300 – 500Hz rather than the usually-recommended 700 – 1000Hz. *Selectivity* of the human ear peaks around 300 to 400Hz where it is some 10 times better than at 1000Hz. The Fletcher-Munson curves, well known to hi-fi enthusiasts, show that the *sensitivity* of the ear peaks around 1000Hz. On a crowded band selectivity should take precedence over sensitivity.

LOW-COST HUFF & PUFF STABILISED VFO

The frequency stabiliser for VFO designed by the late Klaas Spargaren, PA0KSB, in 1973 and to which I gave the name "huff & puff", continues to attract experimenters seeking a means of stabilising free-running LC oscillators. Several variations are described in *Sprat* (No 122, Spring, 2005). Hans Summers, G0UPL, provides two simple designs, including a two-chip huff & puff stabilised 3.5MHz VFO that can be built for about £2: **Fig 4**.

FIG 5 © RADCOM 568

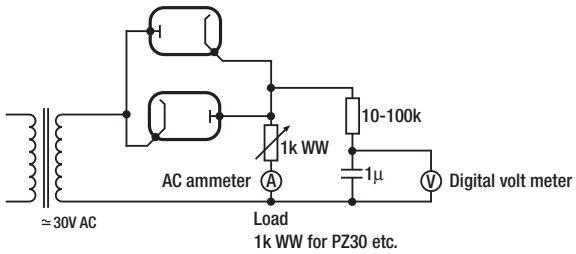


Fig 5
Method for testing the balance of thermionic diodes. Note that most diode rectifier valves have a voltage drop of about 15V at full load.

Fig 6
EB91 product detector designed by GM0HMR for use in an R1155 receiver.

G0UPL writes: "By using an inexpensive and common 32,768Hz watch crystal, the number of division stages required fits into the capabilities of the 74HC4060 oscillator/divider (IC1). The Q10 output is about 32Hz and determines the frequency step between lock points. A D-type flip-flop, IC2a (half of a 74HC74), latches the VFO signal and effectively behaves as a 1-bit frequency counter. The output is integrated via a simple RC network. By using two capacitors, the integrator voltage at switch-on is automatically initialised at 2.5V, leading to very rapid settling of the circuit. The integrator voltage is fed to a varicap diode in the VFO tank circuit. For the varicap diode, I just use an ordinary 5mm red LED and it works well! The 50 – 500k resistor depends on the inherent stability of the VFO.

"But that's not all! By studying the internal logic diagram of the 74HC74, I realised that if the clear (MR) input was held low, the path between the preset (PR) input and the Q-output would function as an inverter. As soon as you have an inverter, you have a potential oscillator! Using a KANK3333 inductor (but others would of course suit) and the circuit values shown, I got 170kHz coverage of the 80m band without further effort. Tuning uses the same 5mm red LED and a 47k potentiometer. The KANK3333 core is adjusted to obtain the desired coverage. By removing the 22pF capacitor from one side of the VFO tank circuit, I got complete coverage of 40m."

In his *Sprat* article, G0UPL also provides details of an extremely miniaturised huff & puff stabiliser using just one HC4060, but with locking steps of 64Hz. And, thirdly, it shows how a frequency counter and huff & puff stabilised two-chip VFO can be built provided that a 32.000kHz crystal is used. Another article in the same issue of *Sprat*, 'Huff & Puff Revisited Again', by John Beech, G8SEQ, also shows how the use of watch crystals can simplify an earlier design by Stefan Niewiadomski (*Sprat* No 63).

VALVE DIODE HARMONIC MIXERS & PRODUCT DETECTORS

Robert B Kerr, GM4FDT, has followed for many years the discussions in 'TT' on mixers, product detectors etc and also thermionic valves. He was particularly interested in the technique of AC-coupling diode rings and the RA3AAE HF harmonic-mixer circuits (first reproduced in 'TT' from the Russian journal *Radio* way back in July 1977). He writes: "I can confirm that it works, the diodes developing a DC voltage to 'back off' the difference in forward voltage. I have even simulated the effect using a program called 'Croclips' by putting three diodes in series on one half of an RA3AAE product detector and one anti-parallel to them. **Fig 5** suggests a quick method of selecting diodes using 50Hz AC.

"I also noticed the comment in the July 'TT' from André Jamet, F9HX, 'Why not use vacuum diodes?'. As a retired TV service engineer with some *big* (power rectifier) diodes (PZ30, PY500, PY88, U808) – been there – done that!

"*Advantages:* They work well, are virtually indestructible, overload gently, do not seem to produce so many high order harmonics as semiconductors (no varactor effects).

"*Disadvantages:* (1) Heater supply required at odd voltages, eg 52V or 26V for PZ30, 42V for PY500, and a drive of 5W or so. The signal handling is excellent however, several volts input before overload. (2) The conversion loss is high, 14dB for **Fig 6**. (3) Small-signal diodes such as the EB91 (6AL5) have a limited current capability and need to work between high impedances. Fig 6 is a good example of their use: a product detector for a WWII R1155 receiver

FIG 6 © RADCOM 569

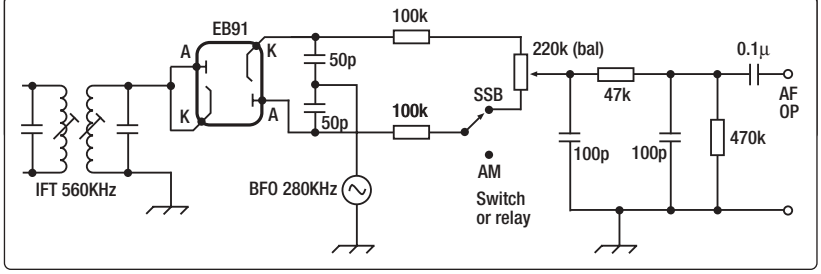


FIG 7 © RADCOM 570

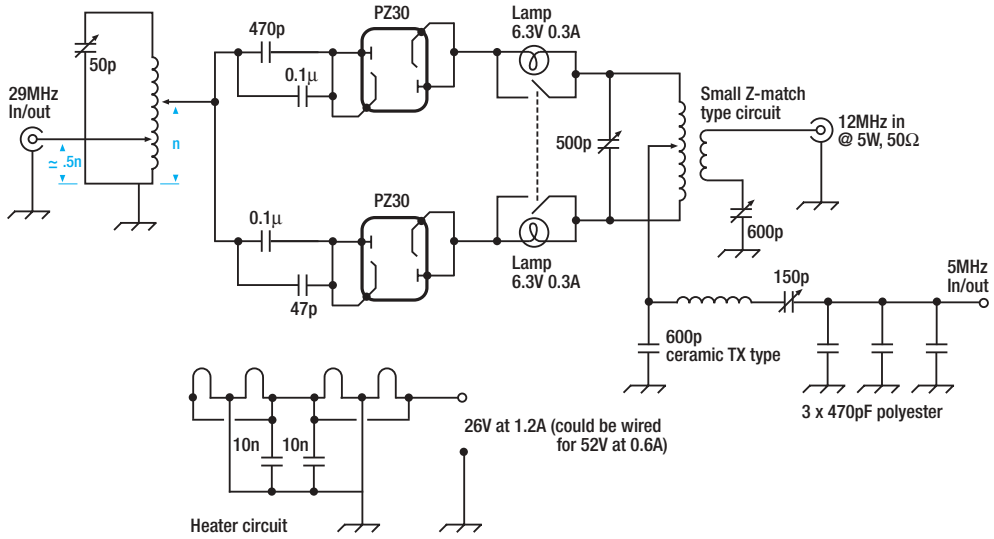


Fig 7
GM4FDT's bilateral transverter mixer used for 5MHz with 29MHz drive.

Fig 8
The VXO with ceramic resonator and the buffer / doubler used by G3DXZ in his 6V, 5W 3.5 and 7MHz CW transmitter with QSK, fully described in *Sprat*, Spring 2005. L1 Toko 10E core (from 10.7MHz IF transformer wound with 15-turn primary (4µH) 3-0-3-turn secondary).

using an EB91 as designed by the late Stuart Martin, GM0HMR. In the R1155, the BFO runs at half the IF. For AM, the BFO is turned off and one diode disconnected by a switch or small reed-relay.

"As a transvert mixer, I use the circuit of **Fig 7** as part of my 5MHz station. It bilaterally transverts 29MHz from an HTX10 rig to 5MHz. To compensate for the conversion loss of around 14dB, a preselector is used for receive, and a 20dB parallel feedback cascode transistor amplifier running at 24V and 50mA is used in the transmit chain. This feeds via a half-wave filter to another cascode PA, a transistor in the cathode of a Class-A PL509 valve. The output is 5W. A 20P4 is used as an electronic T/R switch, This has a 38V heater, dropped from the 40V used for the PL509 from which an HT of about 50V is derived to operate the switch. The system uses negative grid-block T/R control. For an output of 20dBW, I can feed the 5W output from the PL509 to a passive-grid linear amplifier using, at the moment, three 829B double-tetrode valves. The heaters and the screen grids can be switched to allow the use of three QQZO6-40 2.1V quick-heat valves or three QQVO6-40 valves. At 100W, the amplifier is underrun. It can produce about 300W output on the other HF bands with about 10W of drive and 800V HT.

G3DXZ's CERAMIC RESONATOR VXO

'TT' December 1985 summarised a long article by Albert D Helfrick, K2LBA, in *Ham Radio* (June, 1985, pp18 – 26) that showed how ceramic filter resonators, combined with variable mechanical or electronic-diode capacitors, could form very useful stable variable-frequency oscillators, stable over a significantly wider frequency range than VXOs using quartz crystals. K2LBA used 10.7MHz resonators (from FM receivers) and showed that stability could easily be maintained over a pulling range of some 2% compared with the 0.1% of quartz crystals, although the temperature drift is higher. The *Q* of a crystal can be as high as 500,000. For a ceramic resonator, the series resistance can be *lower,* the equivalent inductance is much lower and the *Q* is typically about 600 although this is much higher than a typical LC combination which is typically under 60.

Since then, considerable use has been made of ceramic resonators in VXOs, particularly for QRP transmitters. Even so, Chas Fletcher, G3DXZ writes to say that he has been "utterly amazed" at the stability-range of the VXO that he uses in 'An 80/40-metre, 6V, 5W CW Transmitter with Full Band Cover, Single Knob Tuning and QSK' (*Sprat,* No 122, Spring 2005, pp10 – 16).

He writes: "My reason for writing is that I would like to pursue the source of the stability in the VFO, and wonder if a brief airing in 'TT' might do the trick. Basically, I use a 3.56MHz ceramic resonator closely linked to a parallel resonant LC circuit. The oscillator runs from a 3V supply and I used a low Zener-diode-tuned circuit. As expected, changing the resonance of the tuned circuit pulled the oscillator frequency, but to my utter amazement, I managed to tune the oscillator down to 3500kHz without any serious change in stability. Having achieved 3.5MHz, the way was open to doubling – as in days of old – and on 7MHz the transmitter was still stable."

Fig 8 shows G3DXZ's VFO and buffer/doubler circuit as presented in *Sprat*. The rest of the transmitter was also a little unconventional, as it used an un-tuned doubler and push-pull MOSFETs in the PA running at 6V.

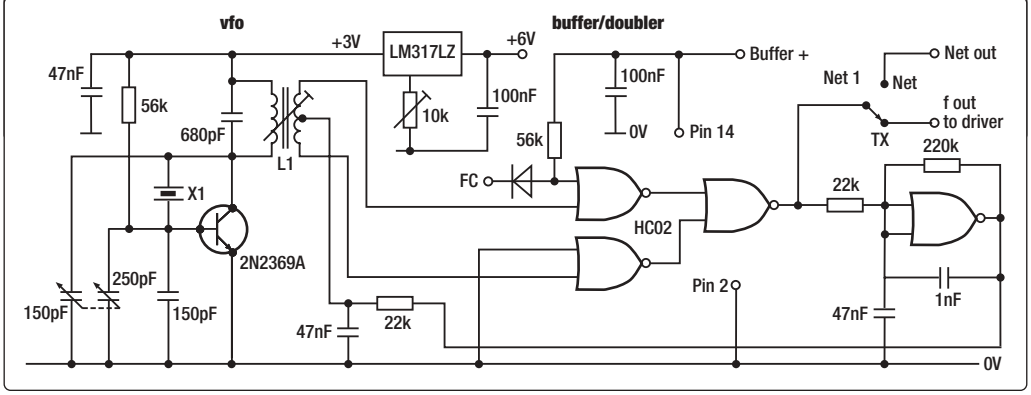
G3DXZ continues: "I personally have not seen such an oscillator design published... My question remains, how does a pulled oscillator based on a ceramic resonator, retain such a degree of stability when so far from its natural resonant frequency?"

While the reported frequency range is within the 2% predicted by K2BLA in 1985 for a 10.7MHz resonator, my guess, and it is only a guess, is that the oscillator is basically an LC oscillator, (not a ceramic resonator oscillator), stabilised by the resonator in what is virtually a modern form of the Goyder Lock of the 1920s and 1930s. This was developed by Cecil Goyder who operated 2SZ, the licence held by Mill Hill School to make the first-ever UK – New Zealand contact in 1924 and became a professional radio engineer. Using quartz crystals, Goyder showed that LC oscillators could be locked by a crystal over a significant frequency range, although there was a tendency for the 'lock' to fail occasionally. One method by which G3DXZ could test this hypothesis would be to remove the resonator and replace it with a low-value capacitor – and see if the circuit continues to oscillate (unstabilised). It would also be interesting to know if the range of stable oscillation extends up to, say, 3600kHz as well as down to 3500kHz.

HERE & THERE

John Walker, ZL3IB (Editor, *Break-In*), comments on the recent 'TT' items on cleaning components: "There is a much simpler way of cleaning ceramic variable capacitors, coil formers, rotary switches, antenna insulators, etc. I just include them in the family dish-washing machine and the rather alkaline dish-washer cleaner plus 'rinse-aid' leaves them all sparkling clean! Old Eddystone ceramic coil formers now look like new!" ♦

FIG 8 © RADCOM 571



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By Enrico Stumpf-Siering, DL2VFR

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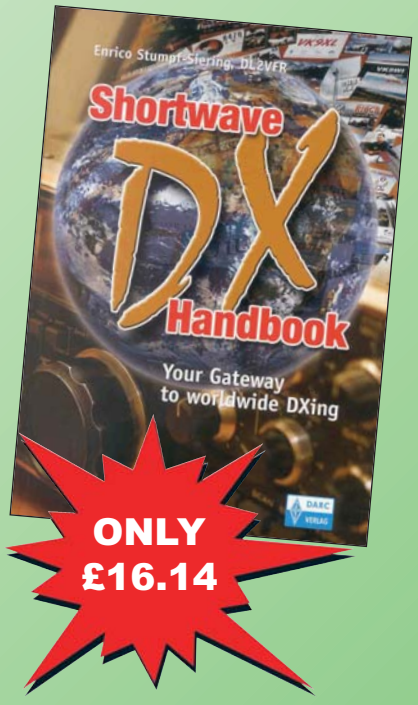

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There's a remote possibility...

This part will describe in detail the second system and how improvements were made to all three of the problem areas within the first system. The new system was also designed to have a more open structure which would make it more flexible, with the ability to substitute different components easily into different positions within the structure.

Before deciding on the approach to the second system, I researched and experimented extensively, and the decisions I took were based on my own personal preferences and priorities. However, I can also understand why other people with a similar goal in mind might wish to make different choices. In the third and final part, therefore, I will examine some of the other approaches and technologies that could be employed and discuss where they might best be used and their relative advantages and disadvantages.

I had often envisaged a home station that would be capable of automating some of the activities that are required when deciding to follow a wanted spot from the DX Cluster. The rig will QSY to the correct band and frequency, the correct antenna will be selected and, if required, the beam will be rotated to point in the right direction and, finally, the auto-ATU will recall the last settings for that antenna and frequency. I would then be ready to listen for the station, fine-tune to the exact frequency and prepare to call at the right moment. What I never thought would happen is that I would be able to do all this remotely before I ever did it at home.

Here were three key decisions that shaped the design of the second system:

1 **Linking the two sites**. It was a fundamental premise that I would use a dial-up telephone line to link the two sites, so the first decision was to use the telephone line to extend my already-existing home local area network (LAN) to the remote site. This is a well-established requirement and can be implemented by devices called LAN modems. The main thing with this approach is that, whereas a home LAN would typically have a bandwidth in excess of 10Mb/s, the throughput of the LAN over the telephone line will be will be much slower and dependent on the type of telephone line used. To minimise the telephone line delays, I opted to upgrade from a normal analogue line to an ISDN (Home Highway) line, and this made a very big reduction to the delays in the system. (During the experimentation phase of the project, I built the LAN initially with analogue modems and then replaced them with ISDN modems. I made measurements using both designs, and the time a small packet of data took to travel over the network reduced to less than one-third. This improvement came from the fact that the link was now entirely digital, so there were no longer any analogue to digital conversions and it gave a solid 64Kb/s bandwidth compared to the 24Kb/s actually achieved with the analogue lines.) There are several other ways to implement a link between the two sites and I will discuss these further in Part 3.

2 **The control program**. Rigs from most manufacturers now have an RS-232 'CAT' computer-control facility with the latest rigs being extensively specified. However, not many manufacturers provide a computer-control program to use with these facilities. Kenwood is the notable exception to this situation, and provides very good control programs for the TS-2000 and TS-480 ranges. Fortunately, there are many third-party rig-control programs available; some are specific to a particular rig or a particular manufacturer, but others cover most of the more popular rigs. I have investigated a few of these, but I soon found one that stood out from the crowd and that is *TRX-Manager* developed by Laurent, F6DEX. A key differentiating feature of this program is that it has been designed with a very efficient remote control capability built in. The program is very flexible and, in particular, there are several ways of frequency tuning which an operator can use according to his / her own preference. There is a simulated tuning knob that can be rotated using the mouse, there are up/down keys where the step size can be set by the user (I have found a 250Hz step size a very useful option) and also a similar mechanism to that used by the Kachina, except that it can use the left/right mouse buttons in addition to using the keyboard. This flexibility extends to the program, being 'OLE'-enabled (this is a programming technique to allow other programs to pass data to and from *TRX-Manager*, which is very powerful). The *Logic7* logging program is integrated this way and Larry, N8LP, has written a small program to allow a footswitch to be used. Even with the complexity of these powerful facilities, the quality of the software is excellent, and the quality of the support is even better! I should point out that I have no association with Laurent other than as a very satisfied customer. There is a very active and supportive Yahoo group, but Laurent himself is very accessible and responsive to enhancement requests.

3 **To PC or not to PC?** Here I mean personal computer not political cor-

David Gould, G3UEG

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E-mail: david.gould@btinternet.com

Part Two

Remote HF operation made practical

FIG 3 © RADCOM 572

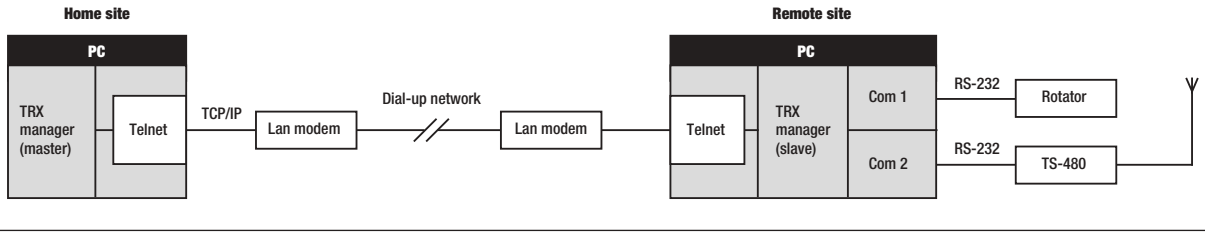
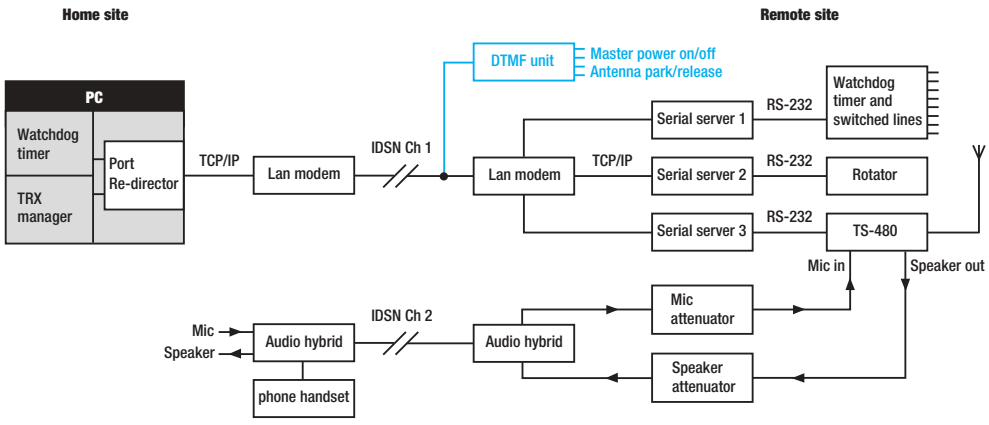


FIG 4 © RADCOM 573



rectness! The decision whether or not to use a PC at the remote site is a crucial one that affects many of the subsequent lower-level decisions. I have to admit that many of the other people implementing remote control systems in other countries are using a PC at the remote site; however, I opted not to use a PC. Because this is such an important decision, I will describe how a remote system can be designed using *TRX-Manager* both with and without a PC, and then explain why I chose not to use one.

Obviously, there needs to be a PC at the home location in both cases.

The PC approach uses two PCs linked over the extended LAN described earlier and the remote PC is the one that requires an adequate provision of RS-232 serial ports to control the various pieces of equipment (see **Fig 3**). *TRX-Manager* runs in master mode on the home PC and slave mode on the remote PC and they 'talk' to each other over the LAN using telnet, which is a common communication protocol. *TRX-Manager* in master mode has a common user interface which generates a standard set of control commands (which at this stage are completely rig-independent) that are sent over the LAN. At the remote site, *TRX-Manager* running in slave mode, converts the common standard commands into the specific commands that are necessary for the rig being controlled, and these are passed to the rig through the RS-232 port. A rotator can be controlled in the same way, and some switching can be implemented off the parallel port. (*TRX-Manager* does have a second method of remote operation called 'real remote control mode', which requires a very high-bandwidth link so is not suitable for a LAN based on phone lines, and only works with some of the recent transceivers.)

Fig 3
Using a PC at the remote site.

Fig 4
Second system using serial servers.

The approach without a remote PC came from N8LP (see 'Web Search'). Consider a normal home situation where there would simply be an RS-232 cable from the computer to the rig. Then imagine you break the RS-232 link and insert a converter, which translates the data from RS-232 to the LAN protocol, which allows the data to be sent to the remote site. At the remote end, another converter translates the signals back to RS-232 for the rig control. In practice, the RS-232-to-LAN

FIG 5 © RADCOM 574

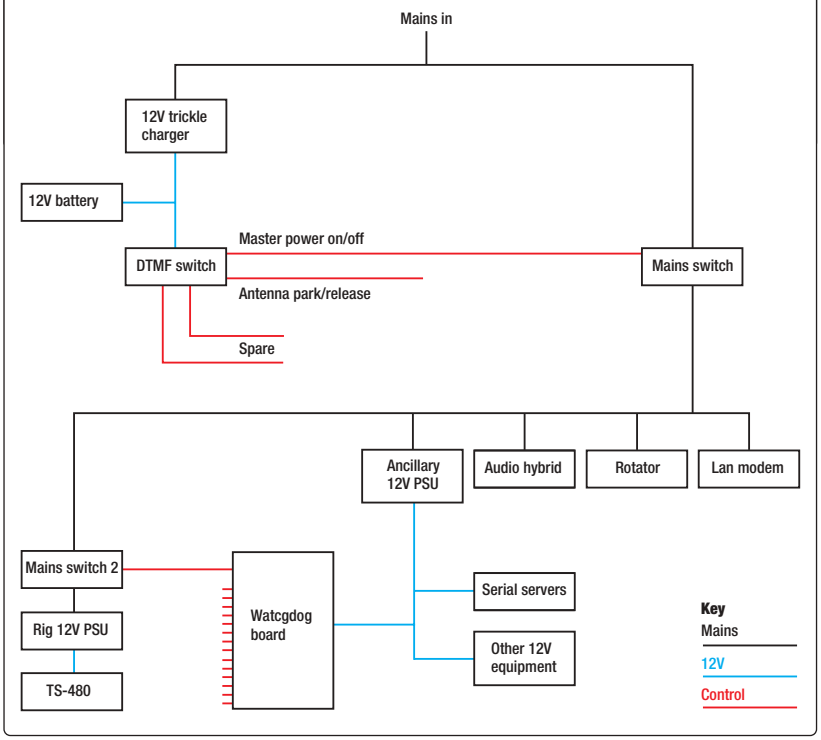


Fig 5 Power control switching.

conversion at the home end is done using 'port redirector' software, and at the remote end uses a hardware device called a serial server. The *TRX Manager* software and any other programs can all work over the one LAN, permitting additional devices, each with its own serial server, to be addressed and controlled. This allows equipment such as a rotator, antenna switching, or even some of the newer linear amplifiers to be controlled remotely (**Fig 4**).

Why did I choose this approach rather than using a PC at the remote site? I have to admit some of the reasons might be slightly emotional rather than totally objective, but that is part of the decision-making process. My concerns about using a remote computer were first the stability and reliability of a *Windows*-based PC, particularly in the slightly hostile environment of my outbuilding at the farm, and second, the complexity of starting up and booting the PC remotely. I know a PC could be in sleep mode and be woken up when there is LAN activity; however, I prefer to have things switched off when not being used. So my personal decision was to go for the serial server approach; for me, the simplicity of being able to power-up devices and for them to be immediately available for use was the deciding factor. However, I accept that there are some potential benefits of using a remote PC and I will cover these in the final part.

TRANSMITTING THE AUDIO

There were two issues with the audio on the Kachina system, the delay and the poor quality. These were both caused by the considerable signal processing that needed to be done on the audio to make the used bandwidth dynamically adaptable to the current phone line performance. Straightforward analogue-to-digital conversion, using dedicated purpose-built systems, can be done very efficiently without any noticeable delay. I stated earlier that one ISDN channel would be used for the LAN extension. All ISDN lines have two channels, but a Home Highway line has a key difference from a straight ISDN line, which is that each channel can be used in either digital *or analogue* mode. So my plan was to use the second channel in analogue mode for the audio and let the ISDN system provide the dedicated purpose-built capability to do the analogue-to-digital conversion efficiently and with high quality. I then had to find a way to interface the audio on to the phone line. As this was a subject I knew very little about, rather than spend more time on this research, I took the decision to buy a ready-made unit. It is known as a Telephone Balance Unit or Audio Hybrid, and is used in the broadcast industry to feed audio between an outside broadcast unit and the studio. There is quite a range of units available from the basic to the sophisticated. Some units offered higher-quality audio, but used digitisation which would introduce unwanted delays, so I chose a mid-range unit which provided two-way audio with simple analogue interfacing to the phone line. At the remote end, I just needed to add simple attenuators to get the audio levels correct (very similar to the common sound-card interfaces used for digital modes). At the home end, I could just plug the microphone straight in; there was enough output on the received audio to drive an efficient speaker directly.

WATCHDOG TIMER

This small but very important component, which is really an intelligent switch, took the longest time to develop, because I could not find a ready-made product. This essential safeguard feature has to detect if the communications link fails, and if it does, make the remote equipment safe by switching off the power to the critical components, and informing the operator at the home site. I eventually found an RS-232-controlled relay driver board that had provision for 16 relays, one of which would be the intelligent switch of the watchdog timer. The important thing about this board was that it contained some inbuilt timers which were programmable, thus allowing the watchdog function to be implemented. A small piece of code was loaded on to the board that would allow a relay to be switched on, but be subsequently controlled by a count-down timer which would switch the relay off if the timer timed-out. Back on the home PC, another program was written which could communicate with the board over the LAN using the

same serial server approach. This control program passes a command to the board every 10 seconds which resets the count-down timer so, as long as these resets are received, the watchdog relay stays activated. If more than two reset commands are lost, the watchdog relay will open and switch off the controlled equipment, and a warning message will be passed to the operator. As well as providing the watchdog function, the control program also provides buttons with which to switch any of the other 15 relays, which can be used for other control purposes.

ENHANCED SECURITY AND SAFEGUARDS

My aim was at least to match the security and safeguard features of the Kachina system. As I experimented with different equipment, I realised that I could easily add some extra security features.

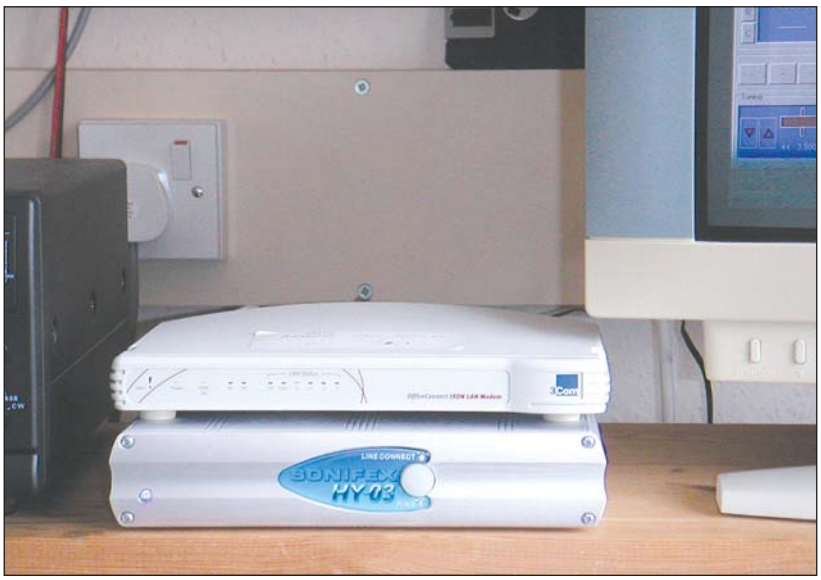
I said earlier that I like to have devices switched off, so this meant I had to have some means to turn the devices back on. To do this, I used a small telephone device which would auto-answer a phone call and contained four DTMF-activated relays. This device is the only one that is permanently powered on through a trickle-charged battery, and can sustain itself for several days without mains supply if required. One of the relays on this device is the master power switch and another is used for switching the antennas from their grounded state when not in use, to an active state when required. The key feature of this device is that it is PIN-number protected so no part of the system can be activated without the correct PIN number being entered. It also has features to isolate itself after repeated failed PIN attempts. This is shown in blue in Fig 4. **Fig 5** shows the complete power control schematic using both the DTMF unit and the watchdog timer.

The LAN modems also had two features which provided an opportunity to tighten up the security. First, the remote modem will only respond and establish the LAN link when the correct ID and password are supplied by the home LAN modem when it tries to dial-in to the remote LAN modem. Second, as part of the build of the LAN, the two modems have to have a unique number assigned to them (their IP-address), the remote modem being set up only to accept data from the IP address that is assigned to the home modem. This provides a similar function to the DIP-switches on the Kachina system, but has more combinations available. It is an added obstacle, but would need further careful design by a network expert to make it completely secure.

USING THE SYSTEM

The photograph shows the small amount of equipment required at the home site. The first step in operating the system is to dial-in to the DTMF unit to activate the master power switch and the antennas. These are latching relays, so this function can use ISDN channel 1 and then disconnect, leaving it free. Next, the LAN link can be established between the two LAN modems re-using channel 1, and allow the watchdog timer to be started. Once this has been done, *TRX-Manager* can be started and, finally, the audio link established on channel 2, giving full remote control of the rig and two-way audio. At any time, the rotator can be turned or any other switching can be done as required. At the end of a session, the links can be closed down and then a final dial-in to the DTMF unit can ground the antennas and isolate the master power switch.

The reduced delays have made the second system much easier and slicker to operate. The transition from receive to transmit is quicker and it is now possible to monitor the remote station from home without difficulty. The reduced delays and the convenient tuning options in *TRX-Manager* have vastly improved the user interface. Finally, the audio quality is much better, and equally good on receive as it is on transmit, making it much easier to listen to – so much so that I am looking forward to a suitable contest in the near future where I can put this to the test.



Home equipment for the second system.

THE FINAL PART

A key part of the design is the more open system framework which will give a sound basis on which different schemes could be designed for different circumstances. In the final part, I will describe some of the alternative technologies that can be used, and discuss their advantages and disadvantages. ♦

WEB SEARCH

LAN modems (3C891A)	www.3com.co.uk
Lantronix serial servers (UDS-10)	www.lantronix.com
Telephone DTMF switch	www.quasarelectronics.co.uk
Watchdog timer RS-232 board (VIOM)	www.phaedrusltd.co.uk
Audio hybrid (HY-03)	www.sonifex.co.uk
Port re-director software (serial/IP)	www.tacticalsoftware.com
TRX-Manager	www.trx-manager.com
N8LP, TRX-Manager add-ons	www.telepostinc.com

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40m long path a well-kept secret

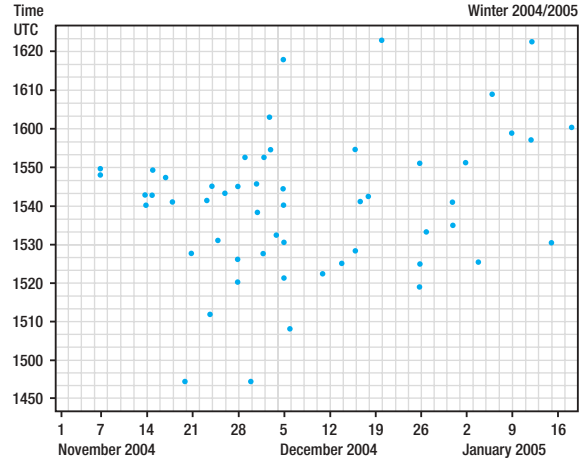
If you look at the propagation table on p67 of the December 2004 RadCom, you will see it offers no hope of working San Francisco via long path (LP) from the UK on 40m. But I can assure you that there is indeed a good chance of doing so. The entire West Coast of North America is accessible via LP from the UK on winter afternoons – and the distance is huge – roughly 20,000 miles. Now that's DXing !!

The LP signal travels around 80% of the globe following the grey-line. The mechanism is something of a mystery, but probably involves ducting between the E- and F-layers of the ionosphere. Signals can be very strong – reaching S9+10dB at times – so it seems unlikely that lossy reflections from the earth surface are taking place.

I live in Washington State, about 500 miles north of San Francisco, and my antenna, a two-element pentagon (see *RadCom*, April 2004, pp88ff), puts out a good signal centered on 200° (SSW). The route goes slightly east of New Zealand and follows the terminator out over the edge of the Antarctic landmass. The great circle track brings the signal up across the Indian Ocean and over the Horn of Africa. I am able to contact 4X4 and A45 just before my sunrise on winter days, when their sunset has already happened. Subsequently, our West Coast signals reach up to Russia, Ukraine, Scandinavia, and later are heard in Southern Europe as the terminator shifts West. As sunset reaches Germany and Belgium, our signals appear in those countries. Last but not least, the signals reach Britain and then France – this happens close to the end of the daily LP session. The sun on the west coast has already been up for 30 minutes by the time the UK stations are audible here and, while some sunlight is needed to prepare the duct, too much absorption in the E- and D-layers shuts off the path.

Long-path contacts between KI7VR and the UK on 40m during the winter of 2004 / 2005.

FIG 1 © RADCOM 575



WHAT IS NEEDED TO CHECK OUT 40m LP ?

A good location and good timing. Some locations are much better than others for hearing and working LP on 40m, and it is not always obvious why a particular location works well. The best thing is to listen and see. Timing is everything – listen from 1520UTC in December between 7001 and 7015kHz. On most days, you will hear a DL station or G3FPQ working a W6 or W7. See if you can hear anything of the US station. If you can hear something, then that's all the encouragement you need! If at first you don't hear anything of the W6s or W7s, be patient – remember the propagation reaches UK last of all.

From **Fig 1**, you will see that the contacts from the UK to my location occur from November to mid-January – late November and early December is the optimum time at about 1540UTC. So, if you get home from work early, turn on the radio and, if your antenna is rotatable, turn it so that it favours SSE (about 160°), pointing out over the Middle East and the Indian Ocean. The times mentioned are for my location, but W6s are far to the south of me, and their signals very often reach UK

at earlier times. Likewise, VE7AHA (a big signal on 40m LP) continues working EU via LP long after the band has gone dead at my QTH.

MY SAGA MAY HELP

I think it was winter 1994/95 when I first realised I could hear Europe via LP on 40m at this location – at the time, I had a ground-plane antenna. I found that if I waited until the sun had risen in California and shut off the big W6 signals, I could actually work some of the European super stations on LP – what a kick, but it made me very late for work! That summer, I put up a second ground-plane and phased the two together to get some gain – that helped, and my 100W was being heard regularly in Europe via LP. Retirement in 1999 solved the timing problems, and my pal G4RCG convinced me that "Life is too short for QRP," so I got a small amplifier (500W output). It was getting easier... but hearing was now the limiting factor, so I made a Beverage (45m long – it just fits into my small lot), and that helped also.

In 2003, I put up my pentagon antenna on a 30ft tower and, as the solar cycle drifted downwards, things got pretty good on 40m LP. The pentagon hears better than the Beverage, so I took that down. It took me nine years to get where I am – hopefully this information will help others do it faster.

RESULTS

Fig 1 shows all the contacts, 47 in total, between the UK and KI7VR during winter 2004/5, beginning on 7 November 2004 at 1548UTC and clustering between 1540 and 1550UTC till mid-November, then spreading considerably in time. The average moves to slightly later times in January. No contacts took place before 1454UTC and none occurred after 1619. The best day was 5 December, with five UK contacts spread between 1520 and 1617UTC. At 1545 on 5 December, the greyline and the long path to UK from here are one and the same (according to W6EL's propagation software). I have no data after 18 Jan, as I left for a trip to KP2, but in these days of low solar flux, LP contacts between the UK and W7 continue, with diminished signal strength, into mid-February.

Table 1 shows the UK stations I have worked over the last three seasons, followed by the number of contacts with each in parenthesis. The right-hand column shows contacts for the 2004/5 season which are plotted in Fig 1, while the other columns show some history.

G3FPQ has a 4-element Yagi on 40m hence the large number of contacts while G4RCG and G3SED use rotatable dipoles. If you have a 'good' location, contacts are possible with verticals, as I indicated above.

So now the secret is out! I hope to see you on 40m long path this coming November! ♦

Table 1
Long-path UK contacts from KI7VR for the last three winters.

2002/3	2003/4	2004/5
G4RCG (3)	G4RCG (8)	G3FPQ (26)
G4BUO (2)	G3SED (2)	G4RCG (6)
GM3UA (1)	G4BUO (1)	G3SED (6)
GW3YDX (1)	G3SJJ (1)	G3MLO (1)
G0JHC (1)	G3RGD (1)	G3YYD (1)
G3XAQ (1)	GI3OQR (1)	G3IEW (1)
G4BWP (1)	G3WPF (1)	G3LDI (1)
G3YYD (1)	GW3TAU (1)	G3LAS (1)
GW4BLE (1)	G3XZR (1)	G0FYD (1)
G3SJJ (1)	G3OOK (1)	G3OAG (1)
		GI3OQR (1)
		G3PLP (1)

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Whatever's happened to 40m?

If you've ever wondered why the skip distance on the 40-metre band always seems long these days, read on. It's all to do with the state of the ionosphere in this declining phase of the sunspot cycle. But there's even more…

Technical Editor's note: An earlier version of this article was published in the Royal Signals Amateur Radio Society Journal, *Mercury*, and we acknowledge with thanks the permission of the editor to reproduce an updated version here.

Having just recently retired, I decided to resuscitate my amateur radio interests by moving my old Kenwood TS-120V from the loft to the study, which is a more convivial place to be from all points of view. This manoeuvre required some clandestine re-routing of the coax from the ATU in the loft that is connected by 300Ω feed-line to a nondescript inverted-V hanging off the chimney. Once I'd ascertained that the sounds of SSB and CW issuing from the speaker were well enough received by she who calls the shots around here, I proceeded to re-acquaint myself with the 40m band. That's when I remembered that the sunspot count was in rapid decline and, consequently, so were the band conditions on HF.

It was soon apparent that propagation was not quite as I'd remembered it when, according to my log, I was last active some five years ago. In fact, it was pretty awful, and G, M and 2E callsigns were rare. On the odd day that I heard them, they were only there for an hour or two at most. Most of the time the band belonged to continental stations, though often talking to G stations I could not hear.

Occasionally, though, one signal or another (most often it was GM4FOZ, the Royal Signals Amateur Radio Society (RSARS) net control station) stood out like a beacon and a look at the *Yearbook* followed by my map told me where he was – all of 370km from my QTH. More listening indicated that the only other signals that were sensibly audible came from at least 100km away. Then, listening to the general tenor of the contacts soon confirmed that the 40m band was not at its best and certainly didn't favour short-skip contacts, so the usual inter-G contacts I was expecting were rather hard to come by. The fact, too, that my TS-120V is set to produce just 5W made it all seem like amateur radio as it should be, ie challenging!

Clearly, the ionosphere was to blame, so my next port of call was the website of the Rutherford Appleton Laboratory in Chilton where the ionosonde previously located in Slough now resides. Of course, the famous ionosonde that Watson Watt used in the 1930s when he gave the ionosphere its name was retired years ago and in its place is a 'digisonde' with all its modern bells and whistles. Again, as one would expect in this Internet age, the data measured by that vertical-incidence sounder are made available, almost in real time, on the RAL website along with a vast collection of archived information going all the way back to the Watson Watt and Appleton era.

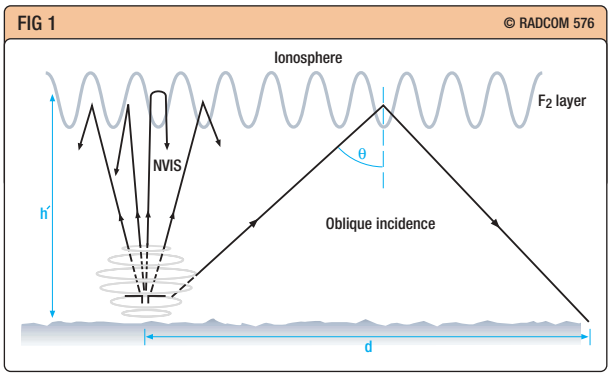


Fig 1
NVIS and oblique incidence HF propagation.

On looking at the current data, sometimes only a few minutes old, it was soon obvious just why the 40m band was behaving the way it was and this prompted me to give it a little more thought. So, instead of getting back into operating, I found myself engrossed in some analysis that was much more the sort of thing I'd thought I'd left behind just a few weeks before, when gainfully employed. What resulted was most interesting and, I trust, will also be to anyone who finds the HF bands as fascinating as I have for 40 years and more.

If the physics of the ionosphere seems a bit daunting, there are some excellent books available on the subject and a good one, written especially for radio amateurs, is that by Leo F McNamara [1].

A MODEL OF THE IONOSPHERE

From the structure of the ionosphere, its various layers of ionised gas and their respective heights above the earth, it's relatively easy to set up a model that allows one to calculate the skip distance prevailing at any given time. It's the skip distance, of course, that determines whether stations some distance apart (but beyond ground-wave range) can work each other or not. Naturally, certain simplifying assumptions always help when doing the mathematics and the most important one employed here is to assume that the curvature of the earth can be ignored over the sorts of distances involved when the radio signal strikes the ionosphere at a very steep angle which is the case for most inter-G working. This 'flat earth model' is shown in **Fig 1** where the angle of incidence θ_i is small.

On 40m, most horizontal antennas, when erected at heights of no more than a quarter of a wavelength above the ground, will radiate straight upwards. This mode of propagation that we've all taken for granted for years was even given its own abbreviation fairly recently (as have most things these days, you'll have noticed!). It's now called NVIS, which stands for 'Near-Vertical Incidence Skywave', and we all use it whenever we work on 40 and 80m. Of course, those able to work on the new 5MHz (60m) frequencies will be well-used to NVIS propagation, since this was one of the reasons why that special allocation was made to radio amateurs.

NVIS

An understanding of how NVIS works is helped if you think of the antenna as a garden hose pointing straight up [2]. The water that gushes out goes in that direction too before gravity brings it all back again. Likewise, the RF energy from a lowish antenna will travel straight up, strike the ionosphere and then return to earth along the same path. With the hose, the returning shower doesn't all land on one spot, of course – it wets an area all around you. The returning RF signal does much the same and covers a large area all the way from the transmitter right out to about 300 or 400km with no skip zone in between. If, for various reasons, the RF energy is only incident on the ionosphere at some oblique angle (also shown in Fig 1), then the reflected signal will indeed skip over the ground in between transmitter and receiver, and a skip zone will exist.

The absence of a skip zone is clearly the advantage gained by radi-

ating the RF energy straight upwards and it's the reason why NVIS plays such an important role in many military and disaster relief operations when a handily-placed satellite or relay station is just not where you most want it. NVIS will enable communications to take place beyond normal ground-wave range and without any intervening skip zone, as long as the frequency is chosen correctly. This interesting and useful mode is also independent of the topography of the ground itself, unlike VHF and UHF which are much affected by mountains, ravines, dense vegetation and the like. By radiating the energy as close to vertically as possible all these obstructive effects are reduced significantly, if not removed entirely.

All antennas, of course, radiate energy within a beam not just a single ray. A typical 40m half-wave dipole, G5RV, or inverted-V, etc, will have similar radiation patterns in that vertical plane. The width of the beam, and the fact that NVIS signals propagate in free space without attenuation by any ground effects, mean that the signal strength will be no more than a couple of dB weaker at 400km than it is just 50km away [3]. This is most noticeable when operating QRP, and is one of the factors, along with the absence of the skip zone, which makes NVIS such a useful communications mode. To use it effectively at any given time, however, we need to know something about the ionosphere at the point of reflection and this is where the ionosonde at Chilton comes in.

THE IONOSONDE AT CHILTON

An ionosonde is a special type of radar for measuring the characteristics of the ionosphere. Typically, it generates a range of frequencies that sweep repeatedly from around 1MHz to 20 MHz, while its antenna usually radiates straight upwards. It is therefore called a vertical-incidence ionosonde and Chilton's is one of those. Now, the highest frequency signal fired straight up (at vertical incidence) that will retrace its steps and come straight down again is called the *critical frequency* of the layer involved. Since that is most often the F2 layer during the day, this critical frequency is given the symbol fo_{F2}. Any frequency above fo_{F2} will penetrate the layer and will be lost in space. Therefore, knowing the critical frequency at any given time will allow us to determine the best frequency to exploit the NVIS mode. Since radio amateurs, like everyone else, don't have unlimited access to the radio spectrum, we have to select the amateur band closest to and *below* (but not too far below) the critical frequency at the time we wish to operate. That process would clearly be mostly hit and miss without access to an ionosonde.

Equation 1
$$MUF = f_{OF2} \sec\theta$$

Equation 2
$$d = 2h' \tan\left[\cos^{-1}\left(\frac{f_{OF2}}{f}\right)\right]$$

Equation 3
$$d = 2h'\left[\left(\frac{f}{f_{OF2}}\right)^2 - 1\right]^{1/2}$$

Equation 4
$$f_{OF2} = \frac{2h'f}{\sqrt{4h'^2 + d^2}}$$

During the month of January 2005, the ionosonde indicated that the virtual height, *h'*, of the F2 layer was about 215km during the day, where it stayed fairly constant. After dark, it rose to more like 300km with a peak at about 350km during the early hours of the morning. The critical frequency, fo_{F2}, by contrast, exhibited considerable variability throughout the day and from day to day. Over any 24-hour period, there was the expected swing from its maximum value usually, but not always, around noon to the minimum at about 0400, with 2MHz (or even less) being typical at about that time. It then rose rapidly after sunrise, but the value it eventually attained was as changeable as the weather and it is this characteristic of the ionosphere that makes HF operating seem, at times, like a lottery. As mentioned, even the highest value recorded didn't occur at the same time every day and during that month it sometimes occurred as early as 0940 in the morning or as late as 1530 in the afternoon, while the actual value of fo_{F2} varied from 5.4MHz to 9.7MHz during the same period.

Such dramatic changes from day to day are so typical of HF propagation via the F2 layer and they are both a challenge and a scourge to every HF communicator. The underlying physics and chemistry that explain most but not all these effects need not concern us here. However, what would be very useful is the means to calculate the skip distance from the data provided every 10 minutes by the Chilton ionosonde and, fortunately, the mathematics to do this is relatively simple. The key to it all is to be found in what is called the 'Secant Law' [4].

THE SECANT LAW

The mathematics goes by this particular name because it contains that rather obscure trig expression sec (which simply equals 1/cos) and it looks like **Equation 1**, where *MUF* is the maximum usable frequency. It is the highest frequency that will propagate over an obliquely-incident path such as that in Fig 1 if the ionosphere at the point of reflection has a critical frequency of fo_{F2}. Since we're considering the 40m band, we'll choose our operating frequency, say 7.1 MHz, to be equal to the MUF. It might be argued that it should be somewhat lower than the MUF to allow for the variability of the ionosphere, with a factor of 0.85 often used to give what is called the 'optimum working frequency' or OWF. But, in this particular case, the Chilton data tells us what the ionosphere was doing no more than 10 minutes ago, so it seems reasonable to let the operating frequency equal the MUF in these expressions.

From the geometry in Fig 1, we can show that the skip distance, *d*, is related to the angle of incidence, θ_i, and the virtual height of the F2 layer, *h'*, by the trigonometrical expression of **Equation 2**, so all that is required is information about the prevailing fo_{F2} and *h'*. Both can be obtained from the ionogram on the Chilton website. After some mathematical gymnastics to eliminate the rather cumbersome trig functions, we arrive at an equation that'll give us the skip distance, *d*, prevailing at any critical frequency, fo_{F2}, and operating frequency, *f*.

Thus we derive **Equation 3**, where *f* is 7.1MHz in all the calculations that follow. If you like, the terms can be rearranged to find what the critical frequency must be for the signals to propagate over a given skip distance, *d*. This turns out to be **Equation 4**.

Since pictures always help to clarify the mathematics, I've plotted a graph in **Fig 2** that uses the first equation to show how the skip distance varies with respect to the critical frequency for any height of the F2 layer between 200 and 350km. It should be emphasised again that the

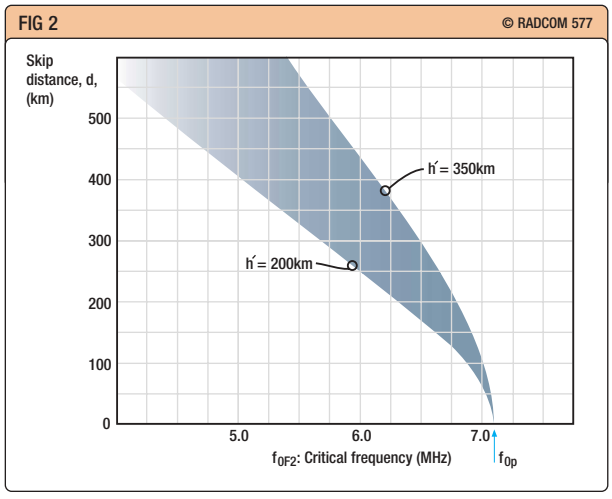


Fig 2 Theoretical skip distance on 40m as a function of the critical frequency for typical heights of the F2 region.

simple flat earth model on which this theory is based only applies, with any accuracy, when the skip distance is less than about 500km, as is typical of any NVIS circuit [5].

THE CHILTON DATA

To illustrate the use of the actual ionosonde data, **Fig 3** shows the variation of the critical frequency over a 24-hour period on 8 and 18 January 2005.

It is immediately evident how different the critical frequencies were on those occasions. Whereas the maximum values around noon on the 18th were above 8MHz, and hence were above the operating frequency in the 40m band, those on the earlier date never even reached anywhere near that 7.1MHz frequency throughout the 24-hour period. Anyone operating on the band on the two days in question will have noticed that G stations were conspicuous by their absence on the 8th, whereas they were there in abundance on the 18th. Let's see what the mathematics tells us if we use this Chilton data to find the prevailing skip distances on the two occasions.

The calculated values of the skip distance on the two days in question are shown in **Fig 4**. You'll notice that on 8 January 2005, when the critical frequency never exceeded 5 MHz, the skip was never shorter than 500km. Throughout the hours of daylight, it fell rapidly from 1600km soon after sunrise, then decreased more slowly from 800km at about 0900 till it reached its minimum distance of about 500km around 1400. After that there was a sharp increase as the sun began to set and the skip distance was more than 1200km at 1800. What all this means from the point of view inter-G working is that no contacts would have been possible between stations closer together than 500km – which certainly carved a great chunk out of the country.

By contrast, things were very different on 18 January. Between about 0930 and 1500UTC, the fo_{F2} actually rose above the operating frequency of 7.1MHz. Anyone listening on the 40m band on those two days would have noted that it was full of Continental signals throughout the day on the earlier date, whereas the G, M and 2E stations had it all to themselves during the late morning and into the early afternoon on the 18th. What was happening on the 18th was that all the UK stations were able to exploit the NVIS mode as their signals travelled upwards at a steep angle, struck the F2 layer and then came down again within a radius of about 400km. Excellent UK-wide communications thus prevailed for about five hours around midday.

If conditions are right, NVIS offers excellent communication possibilities without any skip zone and often with just the simplest of equipment. The problem is being able to predict its availability with any degree of success.

Fig 3
The variation of critical frequency with GMT on 8 and 18 January 2005.

Fig 4
The variation of skip distance with GMT on 8 and 18 January 2005.

FIG 3 © RADCOM 578

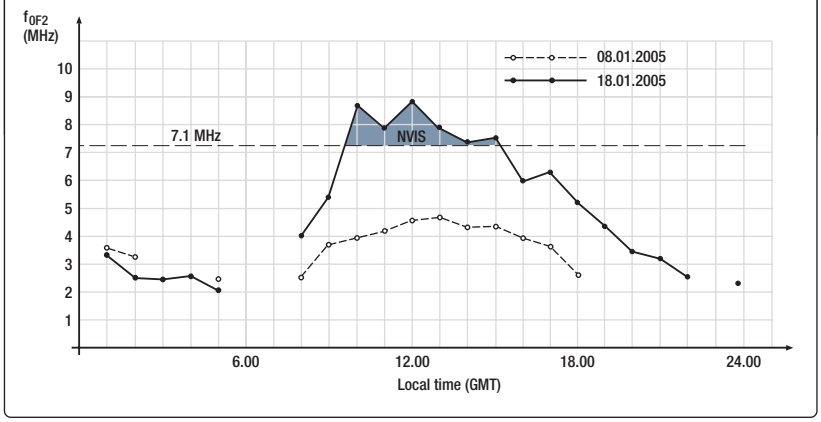
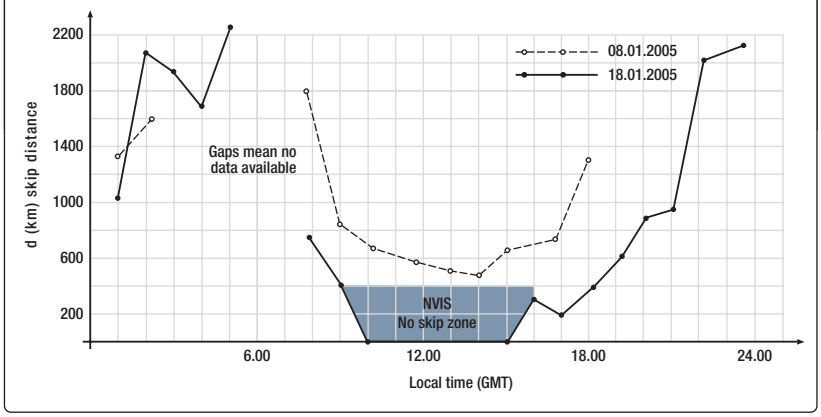


FIG 4 © RADCOM 579



THE FUTURE?

The ionosphere has some considerable way still to go before it reaches the minimum of the present sunspot cycle before beginning its climb to the next peak. As a result, band conditions are not going to get any better for quite a while. However, this should not necessarily be seen as bad thing – it's just one of those many natural cycles over which we have no control at all. But, if you appreciate what is happening within those ionised regions, and if you have information available of their characteristics from day to day, it's quite possible to tailor your operating to suit these unsettled conditions.

Intriguingly, given all the research into ionospheric propagation over the last 70 years and more, it is still not possible to predict the day-to-day variations of fo_{F2} with any degree of accuracy. However, on any given day, the network of ionosondes located worldwide provides all the information from which to determine the best frequency for a particular application. For UK-based amateurs, therefore, the Chilton ionosonde is the obvious port of call and the Rutherford Appleton website makes the information readily available to anyone who wishes to use it following a very simple registration procedure. The web address is: **www.wdc.rl.ac.uk/ionosondes/view_latest.html.**

ACKNOWLEDGEMENTS

I would like to acknowledge the useful discussions with Sarah James and her colleagues at Chilton. In addition, my many contacts with Duncan, G0SIB, so well situated just beyond ground-wave range from my location, provided confirmation of the NVIS propagation path on more than one occasion. ♦

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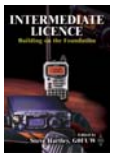

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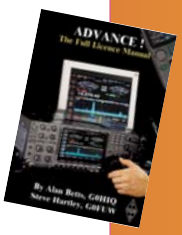

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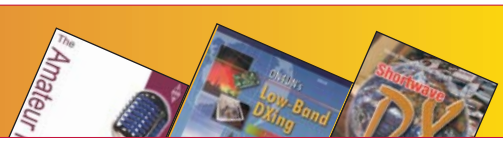

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SDXH	Shortwave DX Handbook NEW	£18.99	£16.14
OPM6	The RSGB Operating Manual	£19.99	£16.99
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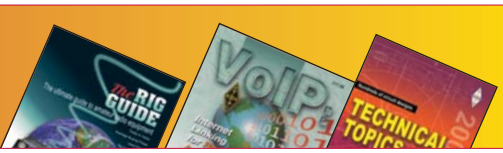

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RG05	The Rig Guide (including p&p)	£3.99	
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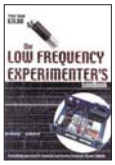
LOW FREQUENCY



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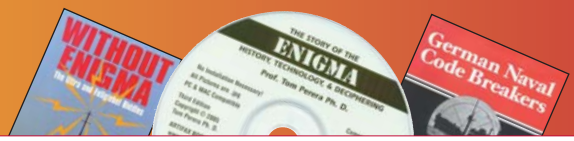

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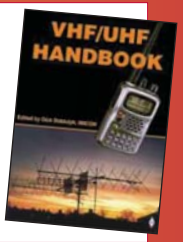

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Members' ads

FOR SALE

ALINCO DX-70TH 100W tcvr boxed as new, £345. Yaesu 747 100W tcvr with original mic and TOA desk mic, excellent radio, £245 with FM. Yaesu FRG-100 rcvr with FM, used 2 weeks only, mint, £265. Radio Shack Pro 2045 200-channel scanner, mint, £75. EA 150 mobile linear, 90W with preamp. New, unused, £50. 01386 881 034 (Evesham).

ALINCO DX-70TH HF/6m 100W all mode mobile/base, £299 ono. Alinco DJ-580 VHF/UHF handheld, £75 ono. Details contact G4GCI, QTHR, 02380 576 371 (Southampton). E-mail: ntpalmer@freeserve.co.uk

AOR AR8600 MkII all-mode rcvr, can be used mobile, portable, base. 100kHz to 3GHz, new 8.33kHz air band channels, memories & loads more. Cost, £600 new, sell for £360 ovno. Kenwood TM-241E 2m mobile mint cond 50W o/p with all standard accessories, boxed, man. Kenwood 13.8V 10A PSU, gc, £120 the pair. Terry, G4OXD, 01462 435 248 (Hitchin). E-mail: tm.rose@tiscali.co.uk

SILENT KEYS

We regret to record the passing of the following radio amateurs:

F9DI	Mr G Delor	05/05
G0BXO	Mr J Leak	07/05
G0CIS	Mr R A Bowman	01/06/05
G0EXY	Mr C L James	15/07/05
G0FNU	Mr V M B Carswell	17/06/05
G0GXR	Mr W S Rutter	01/07/05
G0MYE	Dr R P Watkins	05/04/05
G0PWF	Mr F W G Parkman	24/06/05
G0SKV	Mr R A Beattie	28/06/05
G1NTW	Mr N Marshall	29/06/05
G1SNK	Mr R Chappell	31/03/05
G2BCI	Mr H M Tainton	04/07/05
G2BXZ	Mr K Hinch	22/06/05
G2DAD	Mr C A Robinson	26/06/05
G3GFT	Mr G Oldfield	21/07/05
G3GNQ	Mr G Cutting	29/05/05
G3GTW	Mr D Kirk	13/06/05
G3IXO	Mr H J Tyson	16/06/05
G3JHC	Mr B Jenkinson	06/05
G3KTF	Mr R D May	01/05
G3MVK	Mr L R Davies	18/06/05
G3TIP	Mr F H Gibbons	
G3WZ	Mr R J H Baldwin	
G3YJU	Mr L G Newton	15/06/05
G3ZUU	Mr J H Hammond	02/06/05
G4BXR	Mr K A Chalkley	11/06/05
G4EFP	Mr A Smith	06/07/05
G4ERG	Mr P Etheridge	17/07/05
G4VRI	Mr L F Lockyer	17/06/05
G4YKT	Mr D H Davies	24/06/05
G4YSU	Mr D Hodkinson	03/05/05
G6VUY	Mr D J Christie	24/05/05
G7BQD	Mr B Ward	27/06/05
G7CWV	Mr W J Pugh	30/05/05
G8AEE	Mr T Sanders	
GD3HDL	Mr S E Kelly	05/05
GM0BUL	Mr A B Horton	01/05
GM0MBH	Mr M C Harper	12/05/05
GW2FLZ	Mr B H Green	20/07/05
GW4NZD	Mr J Henderson	11/07/05
M3GIM	Mr S A Ferrie	05/05
VK5ZO	Mr D Clift	07/06/05

ATAS-120 with ATBK-100 antenna + counterpoise kit, fairly new, £200. 01697 748 540. E-mail: mm3xrz@talktalk.net

DECEASED amateur's G3TSO rig 80% complete. All boards complete except main G3TXQ board. Needs filter (incl) fitting, spare set new G3TSO boards. Regret No PA. Shure mic model 450 dual imp. QTY Plessey IC's please state req's. G3ESB, QTHR, 01332 735 896. E-mail: joalan@onetel.com

DRAKE R-4C, T-4XC, AC4, MN7. Kenwood TH-77E, case, battery, power cable, 2m/70cm. Yaesu FT-290R Mutek. SEM Z-match Ezitune. Star Masterkey. Star Memory Keyer. AEA PK-232MBX. Trio dip meter DM-801. All vgc, reasonable offers considered. GM4HQF, QTHR, 01224 646 540 (Aberdeen). E-mail: gm4hqf@dsl.pipex.com

FOUR-bedroom detached house in Essex with large garden. It comes with h/duty Strumech crank-up tilt-over tower. H/duty rotor and beams, etc. Insulated shack in garden with heating, and operator's desk, h/duty electrics, £379,000. G3VOF/W0DOC, 01708 373 366 (Hornchurch). martinfoster@ntlworld.com

FT-101ZD, gwo, spkr cabinet, mic, Morse-key, 41m trap-dipole, Cross-Field Antenna, handbook, £250. H Bohan, GM0FIQ, 12 Loch Way, Kemnay, Aberdeenshire AB51 5QZ.

FT-290R with slide mount for mobile MFJ vertical 40 to 2m. Offers? 01376 515 401 (Witham).

FULL size HF 6-ele mono-bander 20m, Ameritron HF amp, AL 811, vgc, £375. MFJ paddle Bencher Keyer, £30. Tailtwister 2. Rotator H/D HF good cond, £250. Zetagi BV131, £25. Albertech 10m radio, £75. Simon, M1SHA, 01793 724 573, 07787 937 140 (Swindon).

GOOD home wanted: Reel-to-reel tape recorder(s), $^1/_4$-in, 2/2 track. Home-designed and constructed to a high standard. I have reluctantly decided that the time has come to part – even though it will feel like chopping off an arm! Interested (and able to collect in Macclesfield)? Brian, G3GKG, QTHR, 01625 425 552. E-mail: brian@g3gkg.fsnet.co.uk

HUSTLER 6-BTV vertical aerial, £160 collect. Fist mic with Heil HC5, £25. Ditto with HC4, £25. Altai grip dip meter KDM6, £25 (as MFJ 201). KW SWR meter HF, £20. Revex 540 VHF/UHF SWR/power meter, £25. Solarcon vertical 10m aerial, £25. Fred, G1OPZ, 01373 834 483 (Bath).

ICOM IC-706IIG HF/VHF/UHF multi-mode tcvr fitted FL-223 SSB & FL101 250Hz CW filters. 100W o/p HF/6m, 50W 2m, 35W 70cm, 40m mod. Vgc, box, man, £560. Microset SR-100 2m lin amp 5 – 15W i/p 100W o/p. Switchable PA & pre-amp, £70. Kenwood KPS-10A PSU gc, £45. BNOS 12V 6A PSU, £20. Weller PS3D temp-cont soldering iron & PSU, £20. Plus carriage. Terry, G4OXD, 01462 435 248 (Hitchin). E-mail: tm.rose@tiscali.co.uk

ICOM IC-746 HF, 6m + 2m tcvr with optional 250Hz and 500Hz filters fitted. Exc cond, complete with mic, DC leads + man, £600. Carriage extra. Bill Henderson, GM0VIT, 01250 886 324 (Br of Cally, Near Perth). E-mail: bill@bofc.fsnet.co.uk

ICOM IC-746, exc cond, h/b, orig box, £480. Constructors shack clearance. Phone or e-mail for list of good equipment, antennas, books. May deliver locally at cost or carriage extra. David, G8PPR, 01274 651 486 (Bradford). david.bancroft8@btinternet.com

ICOM IC-A22E h/h airband tcvr with VOR receive, c/w headset lead, charger, man, prefer sell to PPL holder or similar, £175 ono. Steve, G4ZUL, QTHR, 01268 546 202 (Basildon).

ICOM IC-R7000 VHF/UHF comms receiver. Exc cond, non-smoker shack, instr book, no box, £375. Yaesu FT-2600 2m mobile tcvr, only light use as base station in non-smoker shack. Exc cond. Complete with h/b, unused mobile fitting kit and original packing/box, £90. H Temperley, M1DXN, 0161 747 4095, mob 07771 932 845. (Manchester). E-mail: howard90nine@aol.com

ICOM IC-R8500, man, boxed. BHI DSP unit carefully fitted by me. As-new cond, £750 + carriage. John, G3XLL, QTHR, 01379 652 043 (Diss).

IDEAL QTH, traditional period 5-bed Welsh Farmhouse in secluded area 3 miles from the expanding and popular town of Carmarthen. One barn nearing completion of conversion to 2-bed house and second barn conversion planning applied for (previously granted but lapsed). Commercial building, could be rented out or converted into indoor riding school, and large outdoor arena. Used at present for generator business which is relocating. Nearest farm $^1/_2$ mile away as crow flies, no TVI. Approx 55 acres of land including beautiful bluebell wood and bordered by the Nant Gwili stream. Land has been managed organically, so haven for wildlife. Large (15ft) pond stocked with fish. Regretfully available due to retirement through ill health. Offers in excess of £580,000 are invited. Enquiries only through Knight Frank, Tel +44 (0) 1432 273 087.

KENWOOD TS-850, £450. Kenwood DSP-100, £150, MFJ-989C Versa Tuner 3kW, £130, Viboplex key, £50. Kenwood speaker SP-230, £15. Roland, G5VQ, 01702 710 000 (Leigh-on-Sea).

KENWOOD TS-870 VGC, £600. Ropex Tx which worked 14 countries on 136KHz, £50. Both items must be collected. G3BDQ, QTHR, 01424 812 262 (Hastings).

CONGRATULATIONS

to the following, whom our records show as having reached 60 or 50 years' continuous RSGB membership:

60 years

G4IOT	Mr A T Hunt-Duke
G8GF	Mr W A Higgins
RS20428	Mr A R A Bunnage
RS9710	Mr F W Adderley

50 years

G3KUG	Mr H Peabody
G3MCN	Mr H James

MFJ-931 artificial ground. Exc cond, £45. Sangean ATS-818 digital rcvr with PSU, boxed, man, £40. Multiband ATU 400W, £45. G5BM, 01531 820 960 (Newent, Glos).

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MOTOROLA HT-600E 99ch UHF h/h tcvr 70cm ham band simplex repeaters CTCSS extension spkrmic, charger, £85 + postage. David, G6OCD, 07989 066 214 (Huddersfield). E-mail: dave@gb3yw.co.uk

PAIR of 2m 17-ele Tonnas in as-new cond with N-type power divider, £75 the lot, no split. Tony, G0OVA, 01344 425 716 (Bracknell). E-mail: crake.tony1@virgin.net

SG-230 Smartuner, good cond, £150. MFJ-1026 noise cancelling signal enhancer, £50. Palomar antenna rcvr noise bridge, £25. Tech Trudipper TE-15, 6 coils, £20. Two-way ant switch SA-450 diecast, £7. Drae PSU 4A 12V, £7. Offers? G3SIO, QTHR.

SGC 2020 tcvr, unmarked, £300. Geoff, 01634 891 017 (Medway).

SGC auto ATU, latest model MAC-200, unused, boxed with man, purchased March 2005, £190. G5BM, 01531 820 960 (Newent, Glos).

SILENT key (G3SHW) – Yaesu FT-757GX/ATU/BNOS 45A PSU HF tcvr, £450. Icom 740/Watson PSU HF tcvr, £250. Kenwood TS-50S/ATU HF tcvr, £400. Icom IC-255 2m FM tcvr, £70. Heatherlite HF linear, £400, plus many accessories. Phone or e-mail for full list. Chris, G4HON, 0161 483 5174 (Stockport). E-mail: vistech@ntlworld.com

SILENT key, All following new, unused. FT-857D complete mobile outfit. Separation kit, extension cables, mic headset, 25A mains PSU. Further details, G3KJX (Northallerton). E-mail: h3kjx@sagainternet.co.uk

STRUMECH Versatower BP36, trailer-mounted. Head unit with thrust bearing, TH3JR beam and 9-ele 2m Tonna. Approx 15m coax for each beam and of rotator control cable. Buyer dismantles beams and removes with trailer and tower, £800. G3GVV, QTHR, 01732 353 360 after 6pm (Tonbridge).

TEN-TEC 585 Paragon HF tcvr. 6.0, 2.4, 1.8, 0.5kHz filters, FM board, matching 961 PSU/spkr, £425. Wayne Kerr B-801 admittance bridge, £8. B221 universal bridge, £10. All complete with mans. Buyer to collect. Alec, G3YPN, 01268 733 852 (Wickford).

TS-570D exc condition, six months old man on CD. Silent Key sale, £475. G1HIP, QTHR (Newton-le-willows).
E-mail: g1hip@hotmail.com

VECTRONICS VC-300DLP 300W antenna tuner, as new but unboxed, £95. Icom IC-735 HF all-band tcvr and gen cov rcvr, perfect example, £300. Buyer collects. M0BJR, 01728 603 383 (Saxmundham).

YAESU FT-1000MP MkV and PSU. Ameritron AL-80B linear. Linear Amp UK 1kW balanced tuner. Microphone MD-200. ABX oil filled 1kW dummy load. Good reason for sale. All equipment only bought within last 6 months. Sensible offers please. Buyer collects or pays carriage. King, 01279 731 070 (Harlow).

YAESU FT-3000 2m FM mobile, £90. Yaesu FT-290R2 2m multi-mode, £80. Kenwood TR-2300 2m FM + (10W linear + PSU), £70. James, M0CYZ, 01677 423 349 (N Yorks).

YAESU FT-817ND mint, boxed, includes Miracle Ducker QRP ATU, £370. Carriage extra. Chris, G1ZMW, QTHR, 01283 551 755 (Swadlincote).

YAESU FT-920 HF/6m as new, boxed. 100W auto-ATU, man, can deliver within 50 miles or at cost of carriage, £650 ovno. Ian, M0IMD, 07790 230 606.
E-mail: ian@douglas117.freeserve.co.uk

EXCHANGE

ALL rcvrs, txs, CW handbooks, numerous transformers, valves etc, for classic m/cycle needing restoration or repair. List available. G3DNE, 01823 321 311 (Taunton). E-mail: will.mary@virgin.net

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73 Amateur Radio magazines. 6's, 70s 80s, 90s, single copies or whatever. Also Yaesu CPU-2500 FM in pwo and good cond visually. Contact 07776 495 381 after 6pm (Weymouth).

COLLINS ATU model 180S in good cond. G3GBB, 01379 783 657.

COLLINS KWM2/2A tcvr and/or PSU/station control. Must be complete, unmodified and clean. Will pay fair and appropriate price for a good example. G3VFO, QTHR, 01435 882 245 / 07712 526 440 (East Sussex). E-mail: terry.hart@btinternet.com

COPY handbook, Kenwood 830S, also AR-88, must be in gwo. G3YEE, 0113 255 9450 (Leeds). E-mail: sronshort@aol.com

DISABLED fan of old days seek pre-1975 QSLs, log books, magazines. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

GANGED tuning capacitor for a B-40D radio or one breaking up. All cost paid. Graham, G7KYX, 01205 871 624 (Boston).

GEM quad, any cond, if centre spider OK. Robin, GM3ZYE, 01671 404 387 (Newton Stewart). E-mail: robin@glenamour.com

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, 0114 231 6321 between 9am and 10pm. No time wasters please (Sheffield).

ICOM IC-781, please e-mail details ASAP or telephone in September. Wyn, GW3YGH/VR2AX, 01792 367 790 (Swansea). E-mail: vr2ax@attglobal.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 693892 (Leeds). E-mail: g4uzn@qsl.net

TS-530SP tcvr. Must be in good cond. G0AXZ, QTHR, 01434 683 507 (Allendale).

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 SEPTEMBER 2005

Northern Ireland Morse Proficiency Tests – Greystoke Community Centre, Antrim. Advanced booking (>10 days prior to test) necessary. John, GI3YRL, 028 9336 7208, jbranagh@supanet.com or Jim, GI0DVU, 028 9266 2270, jim.henry@ntlworld.com

4 SEPTEMBER 2005

SUFFOLK DATA GROUP Five Ss Rally – Raceway Centre Green, Foxhall Stadium, Foxhall Road, nr Ipswich. OT 9.30, £1, accompanied under-14s free. TS, CBS, RSGB, C, CP free, TI on 145.550MHz. Peter, G8HUE, 01473 631 313, peter@sdgrally.org [www.sdgrally.com]

Telford Rally – ***** Temporary change of venue ***** – West Midlands Agricultural Showground, Shrewsbury. OT 9.30. RAFARS. Dave, G8VZT, 01952 222 101, or Martyn, G3UKV, 01952 255 416, or Bob, M0RJS, 01782 516 504, telford-rally@somervilleroberts.co.uk

10 SEPTEMBER 2005

W&S @ Lowe Open Day – Matlock Shop, 01629 832 375.

10 / 11 SEPTEMBER 2005

50th Weinheim VHF Convention – Karl Kübel Schule, Bensheim. LEC, FM, TS, CP, CBS. df1gw@amsat.org

11 SEPTEMBER 2005

LINCOLN SWC Hamfest – Newark Showground, at jn of A46, A1 and A17 at Newark. OT 10am. All rally favourites, RAFARS, plus craft, classic cars, possible fly-in by WWII Auster-V reconnaissance plane, FAM. Roger, 01522 693 848, hamfest2005@mail.com

18 SEPTEMBER 2005

SOUTH YORKSHIRE REPEATER GROUP Great Northern Hamfest – Metrodome Leisure Complex, Queen's Road, Barnsley. Less than two miles from M1 jn 37, five minutes' walk from train and bus stations – follow the brown 'Metrodome' signs from all directions. OT 10.30 / 11am. TS, components, SIG, DF, B&B. Ernie, G4LUE, 01226 716 339, 07984 191 873 6pm – 8pm.

30 SEPTEMBER / 1 OCTOBER 2005

Leicester Amateur Radio Show – Donington International Centre, Castle Donington, Leics, close to jns 23A and 24 of the M1. Geoff, G4AFJ, 01455 823 344, geoffg4afj@aol.com [www.lars.org.uk]

2 OCTOBER 2005

BELGIUM Amateur Radio & Computer Rally – Hall 'La Louvière Expo', La Louvière, access direct from motorway 50km S of Brussels. OT 9am. FM, TS from UK, Holland, Germany & France. Michel, ON7FI, 0032 64 849 596, michel.dewyngaert@skynet.be [www.qsl.net/on6ll/]

7 – 9 OCTOBER 2005

RSGB HFC2005 – Gatwick Worth Hotel, Sussex. 0870 904 7373. hfc@rsgb.org.uk [www.rsgb-hfc.org.uk]

9 OCTOBER 2005

BLACKWOOD & DARS Rally – Newport Centre, Newport, 1 mile from jn 25A of the M4 (jn 26 travelling W – E. OT 10.30 / 10.45am, £1.50. CP free, B&B, TI, TS, SIG, LB, C, DF, WIN. George, 2W1JLK, 01495 724 942, or Dave, GW4HBK, 01495 228 516.

EXETER ARS Radio Rally / Table-Top Sale – Moose Hall, Spinning Path Lane, Blackboy Road, Exeter. OT 10.30am, £1. C, ,CP nearby. Steve, M3WRS, 01392 498 934.

GREAT LUMLEY AMATEUR RADIO & ELECTRONICS SOCIETY Rally – Great Lumley Community Centre, Front Street, Great Lumley. OT 10.30, £2, accompanied under-14s free. B&B, CP, C, model club, radio, hobbies, electronics, computer, satellite and component stalls. Nancy, G7UUR, 0191 477 0036, 07990 760 920, nancybone2001@yahoo.co.uk

15 OCTOBER 2005

W&S @ Jaycee Open Day – Glenrothes Shop, 01592 756 962.

15 / 16 OCTOBER 2005

JAMBOREE ON THE AIR (JOTA)

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@ntlworld.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

1 Sep	GB5BIG: Broad Island Gathering. Bally Carry, Carrickfergus. TLHV27 (GI0PCU)
2 Sep	GB2FRE: Fire&Rescue Extravaganza. Rochdale, Lancs. TLHV27P (G0KBA)
	GB2MN: Merchant Navy. Dundee, Scotland. LHV27 (GM6HGW)
3 Sep	GB0BOX: Boxted Airfield. nr Colchester Essex. LH27 (G4SOB)
	GB6NAM: Newark Air Museum. Newark, Notts. LHV27 (G4DBS)
8 Sep	GB4YOU: Youlbury (Scouts & Guides). Boars Hill, Oxford. TLH27 (G0RJX)
	GB4YOU: Youlbury (Scouts & Guides). Boars Hill, Oxford. TLH27 (G0REL)
10 Sep	GB2LPC: Local Parish Church. Bampton, Oxfordshire. LH27P (G3LQC)
	GB2PPS: Papplewick Pumping Station. Ravenshead, Nottinghamshire. L2 (G0UYQ)
16 Sep	GB2RCC: Radio Amateur Caravan&Camping. Rugeley, Staffs. TLHV27 (G0VEP)
17 Sep	GB0JRR: John Rock Room. Chatham, Kent. L2 (G3PWK)
18 Sep	GB5RSR: Ribble Steam Railway. Preston, Lancs. LH2 (G1PIE)
23 Sep	GB2BF: Blind Fund. Dartford, Kent. LHV2 (G0VJG)
24 Sep	GB0MPS: Metropolitan Police Service. Hendon, North West London. TLHV2 (M0KPB)
	GB0SM: St Mary's. St Mary, Scilly Isles. TLHV (G0PSE)
	GB0WB: Wireless for the Blind. Bradford, Yorkshire. LH (G0PFH)
	GB2BWF: British Wireless Fund. Oldbury, West Midlands. LH2 (G4JSR)

16 OCTOBER 2005

HORNSEA ARC Annual Rally – Floral Hall, Hornsea. G4YTV, 01964 562 498.

Northern Ireland Morse Proficiency Tests – Carrick Rally. Advanced booking (>10 days prior to test) necessary. John, GI3YRL, 028 9336 7208, jbranagh@supanet.com or Jim, GI0DVU, 028 9266 2270, jim.henry@ntlworld.com

19 OCTOBER 2005

HASTINGS ELECTRONICS & RADIO CLUB Autumn Auction of Used & Surplus Equipment – William Parker School, Parkstone Road, Hastings, at 7pm. Gordon, 01424 431 909.

22 / 23 OCTOBER 2005

HAMEXPO 27ème Salon International Radioamateur – Auxerre. [www.ref-union.org]

23 OCTOBER 2005

GALASHIELS & DARS Annual Open Day & Rally – The Volunteer Hall, St John's Street, Galashiels. 10.45 / 11am. TS, B&B, C. Jim, GM7LUN, 01896 850 245, mail@gm7lun.co.uk

29 OCTOBER 2005

ROCHDALE & DARS Traditional Radio Rally – St Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx 2 miles W of Rochdale. Follow the orange arrows from M62 jn20. OT 10.15 / 10.30, £1. CP free, TS, B&B, C, TI on 145.550MHz. Please note that this is a Saturday Rally! John, G7OAI, 01706 376 204 (eve), radars@radars.me.uk [www.radars.me.uk]

30 OCTOBER 2005

RUSTY RADIOS CONTEST GROUP Rally – Cottered Village Hall, Herts (on the A507 between Baldock and Buntingford). OT 10.30, £1 + conc. C, CP, no computers! Sean, 01462 459 724 (eve). [www.rustyradios.com]

5 / 6 NOVEMBER 2005

NORTH WALES RS 19th North Wales Radio, Electronics & Computer Show – North Wales Conference Centre, Llandudno. OT 10am both days; £3 per day, or £5 for two-day ticket. Under 14s free if holding a callsign or if accompanied. B&B, DF, TI on 145.550MHz from 8.45am. Jenny, MW0BET, 01492 549 413. [www.nwrs.org.uk]

13 NOVEMBER 2005

West London Radio & Electronics Show – Kempton Park racecourse, Sunbury-on-Thames, Middx. Paul, M0CJX, 01737 279 108, m0cjx@radiofairs.co.uk [www.radiofairs.co.uk]

20 NOVEMBER 2005

MIDLAND AMATEUR RADIO SOCIETY Birmingham 16th Radio & Computer Rally – New venue – Alderbrook School, Blossomfield Road, Solihull, approx 3 miles from M42 jns 4 or 5. OT 10am, £1, TS, clubs, SIG, CP free, FM, TI. Peter, G6DRN, 0121 443 1189.

26 NOVEMBER 2005

Reddish Rally – St Mary's Parish Hall, Reddish Road & Broadstone Hall Road South, Reddish. OT 10am, £1. C, TI. John, G4ILA, 0161 477 6702, john@mckae.freeserve.co.uk

3 DECEMBER 2005

Martin Lynch & Sons' Christmas Hog Roast & Boot Fair – [www.hamradio.co.uk]

Northern Ireland Morse Proficiency Tests – 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 – Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

5 FEBRUARY 2006

SOUTH ESSEX ARS Mobile Radio Rally – Ken G0BBN, 01842 861 089, hendryken@aol.com [www.southessex.ars.btinternet.co.uk]

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 – Roger, GW4HSH, 01792 404 422.

5 MARCH 2006

CAMBRIDGE & DARC Rally – John, G0GKP, 01954 200 072, j.bonner@ntlworld.com

1 APRIL 2006

GMDX Convention 2006 – Robert, GM3YTS, gm3yts@btinternet.com

20 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]

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*

☐ I enclose a cheque/PO for £ ☐☐.☐☐ p

☐ Please charge to my credit card

Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry date ☐☐☐☐ Issue number (Switch only) ☐☐

Signed _____ Date _____

Section: ☐ FOR SALE ☐ EXCHANGE ☐ WANTED

RATES: UP TO 20 WORDS £5.50; 21-40, £6.50; 41-60, £7.50.
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Free entries

Photo file name (if applicable) _____.jpg/gif

Town _____

E-mail _____

Phone _____

CLASSIFIED

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, 299 Reepham Road, Hellesdon, Norwich, NR6 5AD
Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, Lambda House, Cranbourne Road, Potters Bar, Herts, EN6 3EP

FOR SALE

ISOLATED INTERFACES For PSK-SSTV-RTTY-WSJT-CW. Suitable for SOUNDBOARD PROGRAMS. INTERCHANGEABLE LEAD MODELS AVAILABLE. Also NEW CW model. Registered with PAYPAL. See www.g3liv.co.uk johnny@melvin.com
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Qtz X-tals 455.2 kHz — 28.060 MHz £1-95/unit Incl.call freq. Mtchd 9MHz, 10MHz £12/8, 4MHz £2/8, 10.7MHz £8/8 1.4MHz usb/lsb fltr £14,10.7 MHz 10kHz fltr £8 p&p £1-50 + VAT IQ ELECTRO 0208 391 0545 vincent@jakomin.fsnet.co.uk

UNIVERSAL PORTABLE 12V4500MAH Li-ion intelligent battery. Ideal for FT-817, K2, handhelds and other QRP.See http://myweb.tiscali.co.uk/the817shop Please note no www in address.

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SILENT KEY SALE-RADIOS, Valves, Books, Manuals, HRO coils, Magazines, Negotiable. wwwrabeng.co.uk Lists 01872 862575

EQUIPMENT

VHF/UHF ACCESSORIES AND AERIALS, PMR equipment and spares, Garex Electronics, P O Box 52 Exeter EX4 8WX www.garex.co.uk Phone 07714 198374

G2DYM ANTI-TVI, ANTI INTERFERENCE AERIALS outperform any other commercial wire aerial. Information, testimonials, Large S.A.S.A.E:- G2DYM, Uplowman, Devon, EX16 7PH. 01398 361215 Anytime.

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Medway Aerials rear of 14 Luton Road, Chatham, Kent, ME4 5AA 01634 845073

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE for YAESU rigs. FT-817/ND, FT-847 FT-857/D, FT-897/D,FT-7800, FT-8800, FT-8900, VR-5000. 9 South Avenue, New Milton, Hants H25 6EY. Website: www.g4hfq.co.uk Email: bob.freeth@g4hfq.co.uk Phone: 01425 618092

MISCELLANEOUS

ROYAL NAVAL AMATEUR RADIO SOCIETY seeks your support and membership. Qualify? Join today! www.RNARS.org.uk

WANTED WESTERN ELECTRONICS Valves and S.T.C. Valves to buy or swap, will travel. Alex 07745 344180 or 01273 453520. email: keeprockin@ntlworld.com

CARDS & DESIGN

QSL FACTORY - quality full colour QSL cards. Single and double sided, ready-made and custom. From £24. Fast turn-round. www.qslfactory.com Large SAE for samples: 13 Lumley Flats, Pimlico Road, London SW1W 8NQ

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BUSINESS CARDS

The last word

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right to not publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Additional letters may be published on the RSGB members-only website at www.rsgb.org/membersonly/lastword

A happy mugging

FROM: Alan Greaves, G3JOX

Most radio hams of my vintage have their favourite tales of receiving long-delayed QSLs from long-forgotten contacts from distant, exotic countries. My tale involves a QSL with a difference and from a location no more exotic than the West Midlands.

One day, a couple of months ago, the postman (post lady, actually) presented me with a neatly packaged six-inch cube. I was not expecting a parcel; I had ordered no goods recently and although unworthy thoughts of suspicious packages passed briefly through my mind, I set to the unpacking with mounting excitement.

The box was stuffed with protective tissue paper, which, on removal, revealed a china mug, beautifully emblazoned with my callsign. Who could have sent me so appropriate a gift, combining as it did my radio hobby and my love of good coffee?

An enclosed letter explained the mystery. It was from Philip Cadman, G4JCP, thanking me for a letter that I had written to the editor of *RadCom*, which was published in the issue of November 1984. The specially-commissioned mug was Philip's way of apologising for the 21-year delay!

He had written an article - An Introduction to Data Communication - published in the August issue of that year that had impressed me with the clarity of it explanation of a new area of communications engineering (packet switching) and I had said as much in my letter to the editor.

I have re-read Philip's article and I am no less impressed today by its clarity. The mug, meanwhile, gets well-used and when not in use occupies a place of honour in my radio room.

More on /M

FROM: Geoff Darby, G7RTC

When I wrote my original letter, querying the likelihood of a mobile radio amateur being prosecuted for using a fist mike, and the relevance of the 'exemption' clause to the mobile phone law, I didn't realise what a wide-ranging debate I was opening. Anyone who read that letter carefully would have realised that in citing the case of Apple Girl, I was playing devil's advocate from the amateur radio point of view, and trying to draw what I felt were relevant parallels. I was never actually, at any point, querying the legality of /M operation per se, only the possibility of such action resulting in a prosecution for a different and broadly unrelated motoring offence.

As far as I can see, most, if not all, of the professional responses on the subject have backed up my initial belief that you may well have a prosecution brought against you under certain circumstances and, if you do, you may well have little defence in court. David Taylor, G4EBT, a practicing JP of many years experience, put this very well in his article in the June *RadCom*, with a realistic hypothetical scenario and likely conclusions.

Although Graham Eckersall, G4HFG, another JP, expressed opinions at slight variance with David's in his letter in the July *RadCom*, there was still the implication that under the right (wrong?) circumstances, you may still have a successful prosecution brought against you. The main point of difference of opinion was in how well you might be able to mitigate whatever action is instigated by the prosecution, by way of driving or operating experience, although I suspect that Graham may be advocating a somewhat lenient approach by his court, compared to some others. The most telling response was that of Martin Slater, M0SSO, in the same issue. One has to respect his opinions, as he is a traffic policeman who would be responsible for making a decision to stop a /M driver in the first place. The fact that he tells us that this type of offence - eg due care and attention, not in proper control - is currently high profile, and that the powers that be have indicated that they want successful prosecutions to be brought, rather than letting people go on their way with a friendly ticking off, should serve as a timely warning to all mobile operators.

Mobile operating safety

From: Paul Bradfield

The matter of driving and talking will be a well chewed subject by all and sundry, especially while there are those who are convinced that the human brain has a multi-tasking ability. It does not have and never will have. Talking sensibly takes a lot of brain power. A two-way conversation takes even more. I made the same comments in a letter to *RadCom* August 2001 about driving and talking, and again in January 2003. Then, as now, I suggested reading the report in The New England Journal of Medicine, vol. 336, page 453. This report is now backed up with further evidence from Perth, Western Australia. The results of the survey appear in the British Medical Journal. The brief of the report is that a study of some 450 drivers taken to hospital after crashing found that that using a mobile phone greatly increases the chance of a crash, regardless of age, sex or whether a hands free device was used. Perhaps there will be a survey in the UK to verify these results. Pilots have a simple rule about the priorities of flying, it is Aviate, Navigate, Communicate. Perhaps for car drivers the equivalent would be Drive, Route and Chat. If you must operate mobile radio, use a chauffeur or leave the radio at home!

Safety in perspective

FROM: Peter Dodd, G3LDO

The article on the legality and safety of mobile operation by Mike Grierson, G3TSO (August 2005) is a sensible perspective from the world of aviation safety. This is in sharp contrast to some of the 'astonished', 'stunned' and 'amazed' correspondence that followed the concession on the use of a fist microphone for mobile radio.

I used a hand microphone for many years when operating mobile, mainly because there was not much else. Although not exactly convenient, it is easier than operating a Morse key while driving. I know of a couple of mobile operators who can do this but no one seems to have made any noise regarding using Morse keys with mobile radio. I noted in the safety paragraph in *The Amateur Radio Mobile Handbook* that these days there are a lot of very nice lightweight boom microphones available, with or without the single earpiece (don't use a double earpiece headset). These are much more convenient than the fist microphone. I found the combination of boom microphone and VOX a pleasant operating experience - rather like talking to a passenger in the car. I have learned to suppress the unguarded 'remark' when someone cuts you up or pulls out in front of you.

While on the subject of safety, it might be interesting to look at other aspects of our hobby, particularly those that have caused 'near death experiences'. I have had a few, mostly from electric shocks from high voltage power supplies and mains.

Within amateur radio, I know of two injuries caused by the inappropriate use of ladders, one fatality due to mains electric shock and another due to a heart attack caused by struggling to stabilise an antenna in a gale.

I am in favour of safety information in our RSGB publications provided it is based on facts. Some years ago an article was published in *RadCom* that had such a scary title, 'Mains safety - The Killing Grounds', that authors and editors felt obliged to include it in their publications. At the time, this article caused much concern and confusion among amateurs, particularly as there seemed to be no evidence of accidents caused by PME. Perhaps there has been and we don't know about it. A safety survey might be useful.

Blast from the past

FROM: John Lucas, G3ISU

Referring to the letter 'Best Bent Wire' in the May issue of RadCom, I enjoyed the memory that it revived; however, I feel Tommy Tickle had possibly forgotten the other rhythmical phrase that filtered through the services during the war which I always though was better – 'Best beef essences'. Long may they be remembered and survive!

Fond memories

FROM: Bill, G5OW

Reading *RadCom* July 2005 with the copy of the first T&R bulletin (July 1925) brought back happy memories about a competition - Wolverhampton's best receiver - I won that year using a one valve receiver. The prize was a 12" Revo horn type loudspeaker which I still possess. I was 14 years old at the time. Jack Rushton, G5LK, had two shops in Wolverhampton and he organised the competition. He had my receiver, cards and letters from all over the world in his shop window. I received every encouragement both at school and from well-known Wolverhampton amateurs. When I joined the RSGB in 1930, I was BRS743 and the secretary was John Clarricoats, G6CJ, who I had the pleasure of meeting on several occasions including once at 53 Victoria Street, London where I also met his assistant, May Gasdon. In 1932, I made the first crystal controlled radio for Police cars in Nottingham. In 1934, I made two mobile units for the Gothenburg Police in Sweden. In 1936 I built a 1KW transmitter which was later taken over by the Home Office. In 1949, I escorted Princess Elizabeth and Prince Philip when they came to Nottingham. I have been on the key at GBR Rugby radio. In 2001, I received a letter from the Queen. I have made many friends all over the world and at 95 still enjoy my CW. These are just a few of the highlights of my life.

Serious DXing

From: Peter Chadwick, G3RZP

I was interested in the letter from GW4HBZ in August RadCom, decrying the interest shown in TT in low noise oscillators and high intercept point mixers. He has a point insofar as there are limits (as was pointed out in TT) as to how much of this performance can be used. I do, however, take issue with him about whether or not equipment which is poor on paper is adequate. Anyone who has done serious DXing on the LF bands, especially on 40m, will have come across the receiver overload phenomena, even though they may not have recognised it as such. Performance adequate for casual operating is a very different kettle of fish to that needed for serious DXing - such as working 300+ DXCC countries on 40m. I found this out over 40 years ago with my father's HQ170A. The very high intercept point mixer would seem to me to have major uses in cleaner transmitters: such transmitters also need low noise oscillators - and PA stages. So there's definitely a place for the continued discussion.

Digital divide

Chris Cory, G3MEV

RE Alan Strong's letter, G3WXI is trying to compare analogue with digital! He should realise that in theory, with an all-RGB system, digital TV needn't even see a whiff of PAL subcarrier. His digital picture has been through a lot of processing, discarding a large proportion of the picture content along the way. He is observing the subcarrier which has been regenerated by the digibox and whilst maintaining the colour/luminance phase relationship, the absolute frequency could be well off, just like a VCR. As well as his radio channels being delayed, he should also notice several hundred milliseconds difference between his analogue and digital pictures.

Glued to the box

From: Andrew Howlett, G1HBE

I was very pleased to see the letter from Alan Strong, G3WXI, concerning the video output of Freeview boxes. I have long had an interest in frequency measurement and off-air standards, and several years ago I constructed a TV-locked 10MHz standard of my own design which was fed with video from a retired video recorder. It has worked well over the years and has recently been treated to a rebuild to incorporate the circuitry into a Rediffision 'cable box' from which it derives its power supplies and video signal. My thanks to John, MW1FGQ, for the box and for his kind interest in the subject - I'm sure he thinks I'm barmy! We recently began wondering what we would do when the analogue TV transmitters are turned off - could we simply change over to Freeview, or would the digital signals turn out to be non-synchronous and of little use as a reference? So I did the same experiment as Alan, and ended up with BBC1 analogue and BBC1 digital displayed on the screen at the same time. My results were similar too - there was a difference in 'line' frequency of about one line per ten seconds, or (if my quick mental calculations are correct) about 0.1Hz.

This may not sound much, but at the final output frequency of 10MHz it amounts to 64Hz, not a large error for most amateurs - but if used to lock a 1GHz source the error would be an eye-watering 6.4KHz! Bear in mind also that the output of the Freeview box will be 'clocked' by a cheap and cheerful crystal oscillator, which will have been set 'about right' in the factory, and we have a frequency standard that is anything but. Good thing I have a Droitwich reference to fall back on - I wonder how long before analogue radio is taken from us?

Ale-ready done it

From: Peter Fancourt, G3HEE

With reference to Ken Duggan`s letter (August *RadCom*) in which he proposes, inter alia, a Worked all Breweries award, I have to tell him that I reckon that I am already way ahead of the game. A framed parchment hanging on a wall in my shack testifies to my successful qualification for a Worked all Distilleries award sponsored by United Distillers and organised by the Mid Lanark Amateur Radio Society, whose members gallantly (!) volunteered to set up /P stations at as many United Distilleries premises in Scotland as they could manage. I have confirmation cards from distilleries at Cardhu, Cragganmore, Royal Lochnagar and Blair Atholl, but no free samples came with them unfortunately.

Oh, yes, and the certificate is dated 1 June 1988.

Big bore

From: John, G8KVP

So having a ham radio operator in the Big Brother household is worth shouting about, is it? Personally I'd keep it quiet. Why anyone would want to associate themselves with this drivel that passes for primetime TV is beyond me. I would have thought a radio amateur would have had more sense. Still I suppose it'll make a nice change, when he gets chucked out he can tell the Sun all about his radio station.

Restoring valve equipment

From: EJ Hatch, C.Eng, FIEE, G3ISD

Re Technical Feedback (*RadCom* July 2005): having restored and refurbished several WWII receivers, ie AR88, HRO, etc, and other equipment, I have followed with interest the various contributions to this discussion following the original article by VK6VZ. For what they are worth, my thoughts are as follows:

Bearing in mind that the equipment concerned could be as much as 65 or more years old, if the first object is to ensure performance and reliability, all resistors and capacitors should be replaced with modern types, with the possible exception of silver mica capacitors in coil packs. I realise this contradicts other expressed views, but I think it is preferable to spending time measuring and checking the original components.

The carbon compound resistors of those days tend to go high with age, particularly if of high value to start with. A case in point is where the anode load of the first audio stage in two HROs became almost open circuit, preventing operation. Capacitors of those days usually show a fall in insulation resistance, justifying total replacement. This also occurs in metal cased types with neoprene ends, and the so-called 'bathtubs' in soldered bottom enclosures, both of which might be considered to be hermetically sealed. I believe the fall in insulation resistance is probably due to chemical changes in the (usually) paper dielectric and/or impregnant and not moisture ingress. I think it is false economy not to replace electrolytics, considering that they are probably the least reliable of all components, again bearing in mind equipment age.

As regards the replacement of a valve rectifier with silicon diode(s), I have preferred to reduce the resulting increased HT voltage by inserting a resistor between the rectifier and the reservoir capacitor. If for any reason it becomes necessary to reform/check electrolytics of high capacity and voltage rating, such as for series connection in high voltage PSUs for valve linear amplifiers, the use of a variac with following isolation transformer of suitable voltage output is ideal. The capacitor under test is then fed via a diode, current limiting resistor and milliammeter. The leakage current formula from the 1971 Radiospares Components Applications Data agrees with that in a Mallory catalogue I have somewhere. Incidentally, as well as the RS Data book I also have the Radiospares catalogues for April and July 1971, respectively 80 and 94 pages, slightly larger than A5. How times have changed!

Not everyone will agree with the foregoing, and I hope that it does not appear dogmatic (to each his own!). I also accept that serious collectors of vintage equipment would prefer to retain originals if possible, even to the extent of installing modern capacitors in the original cases to retain authentic appearance.

To the point

FROM: Ray Howes, G4OWY

Do you think it might be a good idea to request that all future correspondents writing to the Last Word keep that nuggets of wisdom and various other comments brief and succinct (like this one)? That way, many more letters could be published in this very important place in the magazine. After all, more often than not, some so-called letters are virtually min-articles rather than a concise to the point observation. In other words, cut the waffle.

Remote HF operation

FROM: Phil Mayer, G0KKL

I found the article by David Gould, G3UEG, in the August issue most interesting. However, I must add a note of warning about his first alternative, using a low power device to control a transmitter on the same premises. Careful reading of BR68 reveals that when this is done, the radiation from the station must not extend beyond the boundaries of the premises. If you have an estate of 10,000 acres, this might be feasible but could the average amateur wind his rig down to this point?

Mobile Morse

FROM: Ian Graham, M1ATZ

After reading with interest the article about the speed of texting versus good old Morse I happened to stumble over a little program for Symbian S60 phones (such as the Nokia 6600/6680 etc) which allows you to write and send an SMS in Morse. Still not as fast as a key but perhaps a halfway house!

Ignorance is bliss

From: Peter Ball, G3HQT

Having been struck by a burst of 'constructivity', I built a tuneable magnetic field strength meter, as described in 'The Antenna Experimenters Guide'. It works fine! Very sensitive!

I dashed around, testing for radiation. I found that the aerial feed coax outer was radiating, the aerial support post, leads from the transmitter, TV aerial, mains wiring, water pipes, the hot (water) tank, gas pipes, the sink draining board, the gas cooker handle, wire coat hangers and even the aerial. I couldn't detect anything on the earth return to the mains supply outer sheath. Should I worry that this was upsetting the radiation pattern of the aerial or just carry on having QSOs? ♦

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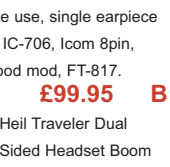

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