RadCom

THE RADIO SOCIETY OF GREAT BRITAIN MEMBERS' MAGAZINE. WWW.RSGB.ORG

AUGUST 2010
VOLUME 86
NUMBER 08

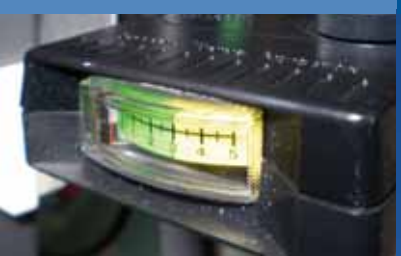
£4.25

Flannan Isles DXpedition

MS0INT takes IOTA to remote Scottish island

0810

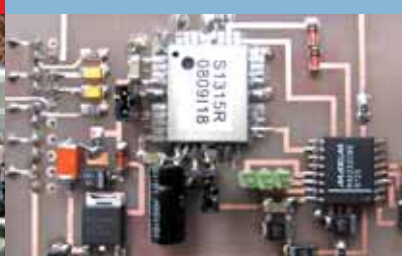
Bike Mobile 2
More technical info on operating /pedal



Bilal Isotron
Ultra-small antennas for the HF bands

Friedrichshafen
Full report on mainland Europe's premier show

Design Notes
Successor to In Practice and Short Circuits



WATERS & STANTON

SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE, KY7 5DF - CLOSED MONDAYS
• ENQUIRIES: 01592 756962 / 0845 5050128 FAX: 01592 610451 EMAIL: jayceecoms@aol.com
• OPENING TIMES: Tue-Fri: 9.15am - 5pm Sat: 9am - 4pm

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS
• ENQUIRIES: 01702 204965 FAX: 01702 205843 EMAIL: sales@wsplc.com • OPENING TIMES: Mon-Sat: 9am - 5.30pm

TEN-TEC
The SSB Company

Check out these great kits from Ten-Tec! All in Stock!

TT-1253	9-Band Rx inc case	£84.95 C
TT-1254	HF Rx inc dig display	£179.95 A
TT-1380	80m CW transceiver	£109.95 C
TT-1320	20m CW transceiver	£109.95 C
TT-1001	Pre-Amp DC-1GHz	£9.95 A
TT-1050	Universal BFO	£9.95 A
TT-1051	Noise bridge	£17.95 A
TT-1054	4-band regen rx	£34.95 A
TT-1056	SSB/CW DC Rx	£31.95 A
TT-1550	Utility Audio amp	£14.95 A
TT-1213	Rig to sound kit	£36.95 C

TenTec Filters

2000	1.8kHz filter	£99.95 C
2001	600Hz filter	£99.95 C
2002	300Hz filter	£99.95 C
2031	500Hz filter	£99.95 C
2032	300Hz filter	£99.95 C

Internal ATUs

AT566K	ATU for Jupiter-538B	£249.95 C
AT566K	ATU for Orion	£249.95 C
AT588K	ATU for Omni-V11	£249.95 C

^ TT-1380 80m Transceiver

^ TT-1001 1GHz pre-amp

< TT-1254 HF receiver kit with digital display

ICOM

ID-E880 NEW

* 2m/70cm 50W Mobile
* D-Star +D-Star Repeat Mode
* Extensive GPS Compatability
* CTCSS & DTCS + Airband Receive
* 1000+ Memories
* Detachable Head

£499.95 D

NEW IC-9100

VHF/UHF Satellite + HF + D-Star **£TBA**

Arriving Soon
100W on HF-2m
75W on 70cms &
10W on 1296MHz
Some items optional

NEW FIND IT CHEAPER? We'll Match it!

IC-T70E

Dual Band 2m/70cm Handy

£159.95 D

IC-E90

Triple band 6m, 2m, 70cms.

£234.95 D

NEW IC-E80D

* 2m/70cm Handheld
* D-Star +D-Star Repeat Mode
* Extensive GPS Compatability
* CTCSS & DTCS + Airband Receive
* 1000+ Memories

FREE software on Icom site

In Stock Now **£369.95 D**

IC-E92D

A great dual band handheld with D-Star fitted. Wide receive

£369.95 D

IC-E2820

Great dualband mobile.

£424.95 D

Fitted with UT-123 D-Star module. £579.95

HF Transceivers

IC-7600 FREE USB keyboard!

This HF-6m transceiver is the successor to the IC-756 series. It takes features from the flagship IC-7800 and the more recent IC-7700, putting them into a package that brings the price within reach of many more hams. **£3379 D**

IC-7800	Deluxe HF / 50MHz All-Mode 200W Transceiver	£7999 D
IC-7700	1.8-54MHz 200W with built-in PSK-31 + keyboard	£5499 D
IC-7200	HF & 6m DSP 0.005-3335MHz wideband receive with USB port	£799 D
IC-7000	160m-70cm 100W (hf) Mobile, portable or base station	£1089 D
IC-718	160m-10m 100W transceiver that brings HF to those on a budget	£519 D

Other Radios

IC-910H	£1249 D	IC-R20	£389.95 C
IC-910HX	£1449 D	IC-R1500	£449.95 C
IC-2200H	£199 D	IC-R2500	£559.95 C
IC-R3	£385.95 C	IC-R8500	£1379.95 D
IC-R6	£172.95 C	IC-R9500	£9799.95 D

NEW The HF AlexLoop

Easy thumb tuning

- 7-Band Loop Antenna
- 40/30/20/17/15/12/10m
- Manual tune in seconds
- 1m diameter loop
- Packs in case 40x27cm
- 20W QRP design
- Includes loop mast
- Easy handheld

£279.95 D

YAESU

Lowest Prices - PHONE!

NEW FT-DX5000 Series

Exclusive Deals Only from W&S!

The new series comprises 3 options : FT-DX5000, FT-DX5000D & FT-DX5000MP. All offer 200 Watts from 160m to 6m. Phone for latest deals and prices! ***DUE JULY - ORDER NOW!***

HF Transceivers

^ FT-450

^ FT-2000

FT-2000	100 Watt 160 - 6m "Industry Standard" Rig	£2079.95 D
FT-2000D	200 Watt version of FT-2000 with built-in PSU.	£2649.95 D
FT-950	100W HF - 6m transceiver with DSP & Auto ATU	£1099.95 D
FT-450AT	100W HF - 6m with automatic ATU & latest updates	£679.95 D
FT-450	100W HF - 6m transceiver - great value.	£589.95 D
FT-DX9000contest	200W HF - 6m "formula one" contest machine	£4599 D
FT-DX9000D	Deluxe fully loaded base station	£7695 D
FT- DX9000MP	Amazing 400W "legal limit" radio	£8549 D
FT-857D	HF to 2m mobile. portable or base - up to 100W	£574.95 D
FT-817ND	HF - 70cms 5W all-mode transceiver	£439.95 D
FT-817BHIDSP	Fitted with DSP module exclusive to W&S	£549.95 D

FAST SAME DAY DESPATCH SERVICE!
Orders must be received before 3pm.

KENWOOD

NEW TS-590E

W&S are pleased to announce the new HF radio from Kenwood. Prices to be announced.

HF Transceivers

TS-2000E £1489.95 D

The TS-2000E is the classic all-band, all-mode base station covering HF - 70cms at up to 100W. Includes dual channel receivers & DX-cluster monitor with built-in TNC.

TS-2000X +23cm **£1749 D**

TS-480HX Ideal for mobile, portable or base station. Gives a massive 200W on HF and 100W on 6m. **£849 D**

TS-480SAT This model gives 100 Watts on all bands up to 6m, but adds a built-in automatic ATU. **£749 D**

Handhelds

TH-F7E	2m/70cm 5W (2-pin Kenwood) SMA +FREE Clip Mic	£229.95 D
TH-K2E	2m 5W 4-Key Keypad (2-pin Ken) SMA +FREE Headset	£159.95 D
TH-K2ET	2m 5W 16-Key Keypad (2-pin Ken) SMA +FREE Headset	£165.95 D
TH-K4E	70cm 5W (2-pin Kenwood) SMA +FREE Headset	£159.95 D

VHF Mobiles TM-V71E £289.95 D

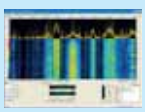
2m/70cm Dualband Mobile Transceiver. Features;- *Wideband Receive, Built-In Echolink, Simultaneous 2 Frequency Receive, Removeable Control Head, CTCSS Encode / Decode, 1000+ Memories, DTMF Mic.*

TM-271E	2m FM 60W mobile. CTCSS, 200 Memories, DTMF Mic	£165.95 D
TM-D710E	2m/70cms 50/50W mobile. APRS +EchoLink, DTMF Mic	£429.95 D

RFSPACE SDR-IQ Receiver

NEW

The SDR-IQ is a high performance receiver covering 500Hz to 30MHz. It is powered directly from PC USB socket and work with Windows or Linux systems. A highly stable unit with dedicated software. **£469.95 D**



New **IF-2000** SDR IF feed for FT-2000 & FT-950. Feed your transceiver IF out into an SDR receiver at 10.5MHz **£219.95**

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

Orderline

01702 206835

Online Catalogue

www.wsplc.com

UK's Lowest Prices

Zero Deposit Zero Interest

BUY NOW - PAY 2011!
INTEREST FREE NO DEPOSIT

BUY NOW PAY LATER AT BOTH STORES

On most items over £200 in value it is now possible to buy with a finance agreement and pay nothing for 12 months without incurring ANY interest charges. If paid in full within 12 months then a £29 settlement fee is payable. **Typical example** of Buy Now Pay Later: Cash price - £600. Pay no deposit and pay the full amount in 12 months. **Pay no interest – just £29 fee OR - 29.8% APR** - Then repay £30.85 per month for 36 months. No settlement fee. Total amount due £1110.60. Interest is calculated from date of agreement. All finance is subject to status – written quotation on request. A Direct Debit agreement must be signed at the time of purchase.

We can arrange finance over the phone or by e-mail

Get that dream radio now!

Enjoy it today - not tomorrow

NOW IN STOCK!
NEW AIRNAV RADARBOX-3D

RadarBox 3D - The world's ultimate virtual radar system with Google Earth as a map overlay & new 3D aircraft picture library.

Full Package **£489.95 C**

Current owners can upgrade to 3D with **RadarBox-UG** for just **£109.95 C**

RadarBox-Pro Basic Package - No 3D **£399.95 C**

YAESU
VHF Mobiles & Handhelds

FTM-10SE	50/40W 2m/70cms stereo FM Mobile	**£269 D**
FT-1900E	***NEW*** 2m Mobile 65W	**£129 D**
FT-2900E	***NEW*** 2m Mobile 75W	**£139 D**
FT-7900E	***NEW*** 2m/70cm Dualband Mobile 50/45W	**£249 D**
FT-8800E	Dualband Mobile 50W / 30W	**£289 D**
FT-8900R	10/6/2m & 70cm Mobile	**£334 D**
VX-3E	2m / 70cm Handheld Wideband receive	**£139 D**
VX-8DE	***NEW*** Triple band 6m-70cms APRS etc	**£399 C**
VX-7R	Waterproof dualband handy (silver / black)	**£259 C**
VX-6E	2m/70cms handy, 5W Wideband Receive	**£199 C**
FT-60E	2m/70cms, 5W handy Wideband Receive	**£142 C**

< VX-8DE

FT-1900E ^

^ FT-7900E

^ FT-2900E

FlexRadio Systems
FLEX-1500 ARRIVES!

£549.95 D

- *160m - 6m All Modes Transceiver*
- *5 Watts of clean RF-Power*
- *USB connection*
- *Selectivity to 25Hz!*
- *Use with laptop for easy portable*

This compact HF transceiver has the same software as its big brothers, so you get amazing performance for a very low cost outlay. Great for laptops!

Flex-3000 100W 160m-6m

Includes auto ATU! Firewire connection.

£1399.95 D

Flex-5000 100W 160m-6m

£2495.95 D

The ultimate SDR radio with amazing front end, extra RX option and 2m & 70cm options.

MFJ
The World's Largest Range From Europe's Largest Stockist.

MFJ-998
W&S
£649.95 C

**Digital & Analogue x-needle VSWR*
**1.5kW SSB & CW *1.8 - 30MHz*
**20,000 memories*
**Built-in antenna selector*
**Auto bypass protection*

MFJ-925	Compact auto tuner	**£169.95 D**
MFJ-927	200W remote auto atu	**£249.95 D**
MFJ-928	Basic auto atu	**£199.95 D**
MFJ-931	Artificial ground	**£112.95 C**
MFJ-932	Mini loop tuner	**£139.95 C**
MFJ-934	Artificial ground + ATU	**£199.95 C**
MFJ-935B	Portable loop system	**£199.95 C**
MFJ-945E	Mobile atu 300W	**£129.95 C**

MFJ-929
AUTO TUNER 1.8-30MHz 200W

LCD readout, 20,000 memories, long wire & coax, radio interface.

W&S £209.95 C

MFJ-991B	Auto atu 150W	**£209.95 D**
MFJ-993B	Auto atu 300W	**£249.95 D**
MFJ-994B	Auto atu 600W	**£339.95 D**
MFJ-962D	1.5kW ATU	**£289.95 D**
MFJ-969	160m - 6m 300W	**£209.95 D**
MFJ-971	Portable atu	**£118.95 C**
MFJ-974B	Balanced ATU 3.5-30MHz	**£189.95 D**
MFJ-986	3kW differential tuner	**£349.95 D**

MFJ-112B
World map clock.
Was ~~£32.95~~ Now £22.95 A

MFJ-1260	Mic control 1 in/2 out	**£99.95 C**
MFJ-1263	Mic control 2in/2 out	**£109.95 C**
MFJ-1275	Sound card adaptor	**£109.95C**
MFJ-1625	Window Ant + Tuner	**£199.45 D**
MFJ-16B01	Dipole centre SO-239	**£21.95 A**
MFJ-16C06	6x dog-bone insulators	**£4.95 A**
MFJ-16E01	300Ω end fed SO-239	**£10.95 D**
MFJ-1796	40m-2m vertical	**£239.95 D**
MFJ-1798	80m-2m vertical	**£299.95 D**
MFJ-1908H	43ft fibre glass mast	**£239.95 D**
MFJ-1922	Digital screw driver control	**£99.95 D**
MFJ-1924	Prog. screw drvr control	**£129.95 C**
MFJ-1925	ATAS-100 controller	**£72.95 C**
MFJ-202B	Receiver noise bridge	**£79.95 C**
MFJ-250X	1kW dummy load (x-oil)	**£55.95 C**
MFJ-260C	300W dummy load	**£44.95 C**
MFJ-261	100W dummy load	**£32.95 C**
MFJ-265	2.5kW load fan cooled	**£199.95 C**
MFJ-403	Micro CW keyer	**£66.95 C**
MFJ-403P	Micro travel iambic	**£79.95 C**
MFJ-4103	PSU for FT-817	**£52.95 C**
MFJ-417	Pocket morse tutor	**£76.95 C**
MFJ-4403	Trcvr volt conditioner	**£109.95 C**
MFJ-442	Slim electronic keyer	**£199.95 C**
MFJ-461	Pocket morse reader	**£99.95 C**
MFJ-4714	4-way remote ant switch	**£87.95 C**
MFJ-4726	6-way remote ant switch	**£159.95 C**
MFJ-490	Memory keyer + paddle	**£244.95 C**
MFJ-495	Memory keyer	**£189.95 C**

VIBROPLEX
UK Distributors

V-CM A compact straight key with super movement.
£63.95 C

V-CW High quality iambic key in the style of Vibroplex
£154.95 C

Watson
Cross Needle Meters

NEW

These are high quality, accurate VSWR meters with large, clear display featuring X-needle movements.

WCN-200 **£69.95 C**
* 1.8 - 160MHz * 0 - 30 / 300 / 3000W
* 600W max above 30MHz * 2x SO-239

WCN-400 **£69.95 C**
* 140 - 525MHz * 0 - 30 / 300 / 600W
* 2x SO-239

WCN-600 **£89.95 C**
** 1.8 - 525MHz * 0 - 30 / 300 / 3000W*
** 600W max above 30MHz * 2x SO-239*

Butternut
Vertical Antennas

These antennas are extremely efficient and use no traps. The large, air-spaced coils are the secret, and resonant adjustments can be made at ground level.

HF-2V 80, 40m DX vertical. 9.75m, Easy erect. **£289.95 D**
HF-6V 80,40,30,20,15,10m self support 7.9m **£389.95 D**
HF-9V As HF-6V but adds 17,12 & 6m. 7.9m **£449.95 D**

Watson
Coax Switches

NEW

These Watson premium grade RF coax switches have been created to fulfil a cost effective need for RF switches that are able to cater for the ever widening commercial RF spectrum.

CX-SW4PL	4-way SO-239	**£56.95 C**
CX-SW4N	4-way N sockets	**£59.95 C**
CX-SW3PL	3-way SO-239	**£41.95 C**
CX-SW3N	3-way N socket	**£49.95 C**
CX-SW2PL	2-way SO-239	**£26.95 C**
CX-SW2N	2-way N sockets	**£32.95 C**

Radio Works
Carolina Windom Ants

G5RV-PLUS
Efficient All-Band Antenna, 80-10m with Balun. 102ft length.
£79.95 C

All windoms include WARC bands

CW-160	160-10m 252' l.	**£159.95 D**
CW-80	80-10m 133' l.	**£129.95 D**
CW-80LP	80-10m 133' l.	**£119.95 D**
CW-40	40-6m 66' l.	**£119.95 D**
CW-40LP	40-10m	**£116.95 D**
CW-40PLUS	40-10m 66' l.	**£139.95 D**
CW-620	20-6m 33' l.	**£119.95 D**

Baluns

B1-2kPLUS	1:1 2kW	**£39.95 C**
B4-2K	4:1 1.5kW	**£49.95 C**
Y1-5KPLUS	1:1 1.8-50MHz	**£52.95 C**

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

WATERS & STANTON

General Enquiries 01702 204965

UK's Lowest Prices

Online Catalogue www.wsplc.com

NEW Hi-Tech Department for Hams & Commercial Customers

We are pleased to announce that we have been appointed as sole distributors for UK and Ireland for AOR & TenTec products. Richard Hillier, formerly of AOR UK, will be joining us as technical consultant.

AOR

There's an AOR for every application. From pocket handheld, to advanced technololgy receivers for specialist government & military applications. Richard Hillier, formerly of AOR UK is now on our staff and will be happy to deal with specialist applications.

< AR-8200

^ AR-8600

< AR-MINI

AR-MINI - Pocket sized scanner covering 100kHz - 1299MHz. AM FM & WFM. Inc. NiMH batt. & charger. ***FREE*** Software download available on AOR site. Accessory lead needed. **£219.95 D**

AR-8200 - The famous scanner with the quality performance. 530kHz - 3GHz AM FM FMW & SSB. Inc batts, charger + cigar lead. **£439.95 D**

AR-8600 - Base station receiver covering 530kHz - 3GHz. All modes AM FM FMW & SSB with standard rotary tuning. Requires external 12V or optional internal batt pack. **£629.95 D**

AR-ONE

The AR-ONE gives you total command of frequencies, modes, tuning steps and more. It is possible to tune in increments of ONE Hertz. Designed to provide MAXIMUM frequency coverage with ALL MODE receive in the MINIMUM cabinet volume, the AR-ONE is specifically designed with the commercial and government operator in mind. Strong signal handling on VHF is particularly good (although sensitivity approaching 1MHz and below is reduced).

- *10kHz - 3.3GHz.*
- *10 VFOs*
- *High Intercept point*
- *PC can control up to 99 receivers*
- *10.7MHz & 455kHz output*
- *Two RS-232 ports*
- *Control head port*

£4595 D

AR-5001D *NEW*

The AR5001D is the most versatile Communications Receiver ever, since the release of the legendary AR5000 receiver! With ultra-wide frequency coverage & a host of operating features hatched by an advanced digital signal processing technology, you'll be on top of the monitoring action with the AR5001D. This receiver is designed to offer extensive integration into a range of communications applications. **Available Sept/Oct.**

- *40kHz - 3.15GHz*
- *All mode Reception*
- *Direct sampling up to 25MHz*
- *Digital Signal Processing*
- *FFT Signal Analyser*
- *IF Out 25MHz - 3.15GHz*
- *0.01ppm Ref. Accuracy*
- *Monitor 3 channels at once!*
- *SD Media recorder*
- *Analogue cideo demodulation*
- *AF 12kHz IQ output*
- *Optional I/Q board & Software*

£2499 D

AR-Alpha **£7495 D**

he AOR AR-Alpha is a commercial grade receiver which may be 19-inch rack mounted or used as a desk-top receiver. Covers 10kHz - 3.3GHz.

SR-2000A

Combined Scanner receiver with live spectrum analyser. 25MHz - 3GHZ NFM WFM AM. **£2295 D**

LA-390

The LA390 is a compact active (30.5cm diameter) loop antenna specifically designed to provide good reception when away from the main monitoring location or when large external antennas are not practical. Compact, but achieving high performance, featuring an internal high-gain amplifier. 10kHz - 500MHz **£244.95 C**

AR-2300

A "Black Box" professional grade receiver with exceptional performance, and a menu of optional additions that allow the operator to configure the receiver for specific custom applications or control it via the internet.

40kHz - 3.15GHz

£2995 D

DA-3200

The DA3200 is a rugged 16 element discone antenna and is Ideal for professional, surveillance and monitoring applications. Ultra wideband design providing continuous coverage from 25 MHz to 3GHz.

£139.95 C

TEN-TEC

The SSB Company

TenTec radios are built in the USA and the range covers both amatuer radio applications and commercial and militray. If you are looking for something that is not mass produced but lovingly designed and built by enthusiasts for enthusiasts - TenTec is the name!

Jupiter-538B

100W All-Mode 160m - 10m Receiver 100kHz - 30MHz

The Jupiter features an easy-to-read reversible blue/grey LCD screen and black case. Thousands of Jupiter transceivers are in use worldwide and are renowned for their terrific audio quality and superb receiver performance. Try one for yourself and discover why Jupiter has become one of Ten-Tec's best selling 100 watt HF transceivers since the original Omni series was released nearly 30 years ago. **£1449 D**

Jupiter-538AT-B With Internal ATU **£1699 D**

Omni-VII-588

OMNI-VII is the first truly Net-Ready ham transceiver. No PC required at the rig to operate remote! Locate your OMNI-VII anywhere you have wideband Internet access. Simply connect built-in Ethernet port to your router with our e One Plug connection. Get live receive AND transmit operation from anywhere else in the world. **£2449 D**

Omni-VII-588AT With Internal ATU **£2695 D**

Orion-II-566

100W All-Mode 160m - 10m Colour Screen Dual Receive

The best in Amateur Radio is now even better with ORION II. Featuring a color screen, all-new suite of roofing filters, new control processor and more. Highest performance HF transceiver available today, analog + IF-DSP, dual 32-bit ADI SHARC processors, lowest composite TX phase noise of any rig available. **£3795 D**

Orion-II-566AT With Internal ATU **£3999 D**

422B 'Centurion'

Amplifier 1.3kW

£319.95 D

Uses pair of 3-500Z tubes. Self contained in a single, attractive black desk top cabinet. For 100W in (max), the power output is 1300W on SSB & CW and 650W solid "key-down" modes. All bands 160m-10m.

238C Antenna Tuner

This is a 2kW "L" network tuner covering 160m to 10m. It is an ideal match for the Centurion linear amplifier. **£749.95 D**

WiNRADiO

A radio system that is built to give value and performance with the very latest technology. There is a great choice!

IN STOCK NOW!

'Excalibur' Receiver

- 9kHz - 49.999MHz - USB Interface
- Software Defined Radio
- 3 Parallel Demodulator Channels.

The WR-G31DDC "Excalibur" receiver heralds a new standard of performance at a very affordable price. The robust front end handles today's busy bands with ease. You will love the live spectrum display (up to 50MHz wide) and absence of significant spurious signals. **£649.95 D**

WR-G303e 9kHz - 30MHz **£659.95 D**
This is the basic short wave receiver with external hardware interface. The PD version offers professional demodulating software. The "I" version is on an internal PC plug-in card.

WR-G303e/PD	**£759.95 D**
WR-G303i	**£559.95 D**
WR-G303i/PD	**£639.95 D**
WR-G305e 9kHz - 1.8GHz	**£699.95 D**

The wide band coverage version, again with PD and "I" versions.

WR-G305e/PD	**£799.95 D**
WR-G305e/WFM/PD	**£899.95 D**
WR-G305i	**£589.95 D**
WR-G305i/PD	**£699.95 D**
WR-G305i/WFM	**£699.95 D**
WR-G305i/WFM/PD	**£799.95 D**
WR-G313e 9kHz - 30MHz	**£1275.46 D**

A high performance receiver covering the entire LF to short wave spectrum. The "I" version is mounted on a PC card.

WR-G313i	**£1065.43 D**

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

MANAGING EDITOR:
ELAINE RICHARDS, G4LFM
E-mail elaine.richards@rsgb.org.uk

TECHNICAL EDITOR:
GILES READ, G1MFG
E-mail giles.read@rsgb.org.uk

RSGB ADVERTISING:
KIM MEYERN

All contributions and correspondence concerning the content of *RadCom* should be posted to: The Editor, *RadCom*, 3 Abbey Court, Fraser Road, Priory Business Park, Bedford MK44 3WH
Telephone. 01234 832700
Facsimile. 01234 831496
E-mail. radcom@rsgb.org.uk

Advertising. All display and classified advertising enquiries (except Members' Ads) should be sent to: Chris Danby, G0DWV, Danby Advertising, Fir Trees, Hall Rd, Hainford, Norwich, Norfolk, NR10 3LX
Tel./Fax. 01603 898678
E-mail. adsales@rsgb.org.uk

Notices to readers concerning errors and omissions and advertisments can be found at www.rsgb.org/radcom/notices.

RadCom is published by the Radio Society of Great Britain as its official journal and is sent free and post paid to all members of the Society. **The September issue of *RadCom* is due to be delivered to UK addresses by Monday 23 August.**

Closing date for contributions, unless otherwise notified, is five weeks prior to publication date.

All material in *RadCom* is subject to editing for length, clarity, style, punctuation, grammar, legality and taste.

No responsibility can be assumed for the return of unsolicited material (if in doubt, call us first!)

Original concept, layout and design by Imotea Creative Mediadesign.
E-mail. radcom@imotea.com

RSGB MEMBERSHIP – Annual Rates

Full membership £48.00
(individual & club)

Family membership £57.00

Paying by Direct Debit saves £4 on the rates above.

Student (21-25) . . . . . Free

Ham Club (under 21) . . . . . Free

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

P&P on RSGB orders:
£1.95 for 1 item, £3.50 for 2 or more items. Overseas rates on request.

Front cover image: Stunning host to the Flannan Is, scene of an IOTA DXpedition in June.

Photo: SM0MDG

Mount your VHF preamp transistors carefully – P 19

News and Reports

All the fun at Friedrichshafen – P 32

Reviews

Features

Technical Features

Regulars

Solar powered portable – P 78

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.

General Manager:
Peter Kirby, FCMI, MISM, G0TWW
Honorary Company Secretary:
Rupert Thorogood, G3KKT
Honorary Treasurer:
Dr R Dingle, G0OCB

BOARD OF THE SOCIETY
PRESIDENT
Dave Wilson, M0OBW

MEMBERS
D Beattie, G3BJ
R Bellerby, GM3ZYE
P Brooks, G4NZQ
L Butterfields, G0CIB
D Field, G3XTT
J Gould, G3WKL
C Morrison, GI4FUE
I Phillips, G0RDI
B Reay, G8OSN
J Stevenson, G0EJQ

REGIONAL MANAGERS
L Paget, GM0ONX - Region 1
D Morrison, GM1BAN - Region 2
K A Wilson, M1CNY - Region 3
H Scrivens, G0UGE - Region 4
T Bailey, M0KMB - Region 5
M Harper, MW1MDH - Region 6
J Sneddon, MW0EQL - Region 7
P Lowrie, MI5JYK - Region 8
A Johnston, G8ROG - Region 9
G Keegan, G6DGK - Region 10
P Helliwell, G7SME - Region 11
P Brooks, G4NZQ - Region 12
J Stevenson, G0EJQ - Region 13

Details of the Society's volunteer officers can be found in the RSGB Yearbook and on the RSGB website.

HEADQUARTERS AND REGISTERED OFFICE
3 Abbey Court, Fraser Road,
Priory Business Park,
Bedford MK44 3WH
Tel: 01234 832700
Fax: 01234 831496

QSL Bureau address:
PO Box 5, Halifax, HX1 9JR, England.
Tel: 01422 359362
E-mail: qsl@rsgb.org.uk

E-mail addresses:
sales@rsgb.org.uk (books, filters, membership and general enquiries) GB2RS@rsgb.org.uk (GB2RS and club news items) RadCom@rsgb.org.uk (news items, feature submissions, etc) AR.Dept@rsgb.org.uk, RCE.Dept@rsgb.org.uk (Examinations) IOTA.HQ@rsgb.org.uk (Islands On The Air) GM.Dept@rsgb.org.uk (managerial)

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

The online *RadCom* can now be found at www.rsgb.org/radcom.

RSGB Club of the Year

The Radio Society of Great Britain has invited Waters & Stanton PLC to be principal sponsors of the National Club of the Year competition.

The initiative has been set up by the Society to encourage the membership and growth of radio clubs around the country. Each Region runs its own regional competition and then each regional winner will be invited to take part in the National Competition.

The winning Club receives a £1,000 cash prize, the second place receives £500 and the third place £250. The prize-giving will be held at the Society's Annual General Meeting.

Waters & Stanton already sponsor their local regional competition – Region 12 – which was last won by the Chelmsford Amateur Radio Society (CARS) who then went on to win the national prize.

Peter Waters, G3OJV said, "We are delighted to sponsor this competition which aims to encourage our hobby through local club activities. We have many active clubs around the country who deserve our support".

Members of CARS receiving their regional prizes from Jeff Stanton, G6XYU at Waters & Stanton's premises in March 2010.

Commonwealth Medal

The Commonwealth Medal is awarded each year to the entrant(s) who have, in the opinion of the members of the Contest Committee, contributed most to the Commonwealth Contest over the years. The recipients, who will be regular entrants, may have been an entrant from a more unusual Commonwealth call area, have stimulated entrants through local publicity, may have helped in running the contest, yet may not have been in a position to win one of the major trophies. It goes without saying that their operating standards and good humour will have been an example to all of us.

The Commonwealth Medal 2010 was awarded to Gary, VE1RGB. The website www.beru.org.uk/Awards/Awards.htm contains a list of previous recipients.

Vacancies - EMC Committee Chairman

The current Chairman of the RSGB EMC Committee has indicated his wish to retire from the post and so the Society is seeking a new Chairman for this important committee.

The EMC Committee has three roles:

- To keep abreast of latest technical trends in EMC matters, and to monitor potential threats to the radio spectrum from non-radio devices
- To monitor the regulatory situation and to advise and take action where the interests of radio users is not being adequately safeguarded by the regulatory authorities
- To educate and lobby for good EMC practice amongst members, legislators, regulators and others, both in the UK and EU.

The Society now seeks an energetic and dedicated Chairman to lead the Committee in these areas. The successful candidate will have proven leadership skills, a good working knowledge of the technical principles involved in EMC, be able to present arguments both in writing and orally in a cogent and persuasive way, and, working with the Board EMC portfolio holder, will be capable of planning and implementing an influencing strategy to achieve defined goals at governmental and regulatory levels.

The Society is also looking for one or two additional people to join the Committee. Here a burning interest and competence in EMC matters, and the energy to take some of the workload of the committee is essential. In particular, experience of political lobbying at governmental and EU level would be a distinct advantage. The Committee only meets six times per year, so much of the work is done by e-mail and remote conferencing. For more details and an informal discussion about these exciting opportunities, please contact the RSGB Board member responsible for EMC matters: Don Beattie, G3BJ, at g3ozf@btinternet.com or on 01694 781 666.

CONGRATULATIONS

To the following members whom our records show as having reached 50, 60 or 70 years' continuous membership of the RSGB.

70 years

Mr J Sagar	GW3ARS

60 years

Mr E F Steventon	G3JJA

50 years

Dr A E Wilson	G3MAE
Mr E K Tunstall	G3MSO
Mr A J Taylor	G3NYE
Mr M S Beer	G3OGZ
Mr K Frankcom	G3OCA
Mr J Greaves	G3UXM
Mr D H Squires	G4DAC

RSGB VHF & UHF Beacon Policy Statement

The Board of the Radio Society of Great Britain recognises the importance of beacons to the hobby and has agreed a formal policy to provide support for beacons in the VHF and UHF bands.

The policy specifically relates to beacons in the frequency range 40-440MHz only. In formulating this we are cognisant of the need for a sufficient and sustainable number to provide UK radio amateurs a means for determination of propagation paths, frequency, bearing, calibration, alignment and other purposes.

Only affiliated beacon groups may apply for either:

a) A contribution towards the running costs or
b) A contribution towards a fixed setting up cost.

The former will be for a limited time period only.

In order to encourage long term sustainability, it is emphasised that support will only be provided to organised groups, rather than individual beacon keepers.

Applications for such support will in the first instance be assessed by the Society's Beacon Panel on the basis of merit. Other factors that will be taken into account are accountability, continuity and sustainability.

Applications in the first instance should be forwarded to Technical Portfolio director Leslie Butterfields by e-mail to g0cib@rsgb.org.uk who will be happy to advise.

Residential Workshop - Question Writing for RCF Examinations

The RSGB, in collaboration with the Examinations Committee of the RCF, is to hold a residential workshop in Manchester, from Friday evening, 29 October through to late afternoon on Sunday 31st. Applications are invited from those with a serious interest in writing multiple choice questions and the aim of the weekend is two fold: to explain what makes a 'good' question and to add well-written questions to the examination question bank.

Accommodation and subsistence will be provided and participants may claim travel costs. Copyright of all questions produced will remain with the RCF/RSGB.

Further details and an application form may be obtained from Robin Bellerby, GM3ZYE, Director - Education and Training. "Glenamour", Newton Stewart, DG8 7AE or, preferably, via e-mail to gm3zye@rsgb.org.uk.

QSL Matters

A big month for shipping QSL cards and Germany scores again (sorry football fans), this time with 30kg, just beating Spain on 20kg with 10kg each going to Belarus, Czech Republic, France, Poland, Russian Federation, Slovenia, Ukraine and USA-0.

Smaller packages of 5kg went on their way to China, Falklands, various Gulf States and Lithuania.

HOLIDAYS. August is peak portable radio season and the bureau is urging you to think about the resulting QSL cards that may arrive with us years after your holiday.

Just saying 'QSL via home call' means little to a foreign station if you are operating in GI, but really reside in GM. Many stations mistakenly use club-only prefixes particularly GP, GH or GT, etc when they should be using the personal prefixes, such as GU,GJ or GD. Check page 4 of your licence.

To avoid wastefully sending and returning cards to the wrong sub manager, visitors need to think ahead and lodge some envelopes with the correct Island or prefix manager. Remember, Isle of Man and Channel Isles stamps are different and should be purchased during your activity. Even if you don't send cards, someone will send you one. Also if you're using postcards, buy standard size; large cards are prone to damage.

QSL CHANGES. Dave Bourne, the QSL sub manager for the BRS, short wave listener series of QSL cards is stepping down from his post, which he has held for 35 years. The Society and the listening community is greatly indebted to Dave. His place is being taken by another long time avid listener, Rob Small, BRS8841. All cards waiting and collection envelopes have been transferred to the new manager whose details can be found in the members section of the RSGB website and will appear in the 2011 *RSGB Yearbook* later this year.

Board & Regional Elections 2010

Board

On this occasion there are no vacancies.

Regional

Early indications are that there are six vacancies. Full details will be published in the September issue of *RadCom*.

GB4FUN

The 25th AMSAT-UK International Space Colloquium will be held on the weekend of 31 July to 1 August at the Holiday Inn Hotel, Guildford, close to the University of Surrey. GB4FUN, the RSGB mobile, fully self-contained communications centre, will be on-site for the duration of the colloquium and there will be satellite operation demonstrations as time and satellite passes allow. AMSAT-UK and individual members are proud to be the contributors of the Amateur Satellite equipment that is in use as part of GB4FUN.

Welcome

The RSGB would like to welcome to the RSGB family the following new Members who have joined their voice to ours and are helping to keep the RSGB strong.

20MWH	Mr M Hetherington
2E0DRT	Miss C Brock
2E0TXT	Mr P W Johnson
2E0YAN	Mr A Watkins
2I0EXP	Mr A Boyd
AE6TY	Mr E Harriman
DG1OJ	Mr A Voge
G3CXR	Mr E H Clegg
G3KPO	TS Royal George
G3UIT	Mr B C Seedle
G3WTD	Mr J Davis
G4XZK	Mr S Bond
G6DZH	Mr K Killigrew
G6JVT	Mr C Santer
G6MML	V Bates
G7TWX	Mr M Wright
G8PY	Mr C BELL
GM3VXI	Mr A Crabb
GM4GUF	Mr R Storeton-West
GW0SXE	Mr G Williams
GW4KCV	Mr R Murray-Shelley
GW6SIX	Mr P MacMillen
IK5FGJ	Mr R Tampolli
KC9PJX	Mr M Anglin
KL0DR	Mr R Dowling
LA8GK	Mr I Molsknes
M0DSF	Mr D Fenna
M0MCI	Mr P Illidge
M0MDA	Mr M Dailey
M0YSU	Mr G Cummings
M1BTF	Mr M Wimpenny-Smith
M1CDU	Mr G Temple
M3SET	Mr S E Taylor
M3XFG	Mr T Large
M5DND	Mr N Read
M6ABY	Mr CWB Storr
M6CDA	Mr A Sorley
M6DAW	Mr D Harris
M6DIB	Mr D I Bloxsome
M6FLE	Mr P Threakall
M6HAS	Ms H Searle
M6IJQ	Mr R Bedford
M6ISO	Miss I Wiltshire
M6JPY	Mr J Ramsden
M6KSH	Ms K Haywood
M6OMZ	Mr S Smith
6PJE	Mr P J Elmore
M6PKP	Mr P J Kirby
M6SOJ	Mr SAH Hill
M6SQI	Mr H Blythe
M6TGS	Master A Stubbs
M6WFD	Mr J Walford
MM3YFT	Mr P Finnie
MM3ZQS	Mr HG McPhillips
MW3ZKY	Mr J R Jones
MW6TAK	Mr C Smith
N2CLB	Mr C Bullock
NG9W	Mr D M St. Pierre
PD7KDN	Mr K Duindam
RS194695	Mr White
RS204188	Mr G F Angell
RS206135	Mr P Munson
RS206167	M M Fairchild
RS206179	Mr R Stewart
RS206283	Mr D Barraclough
RS206287	Mr R D Hambly
RS206288	Mr J J Cassar
RS206289	Mr B Goodenough
RS206290	Mr P Scullion
RS206296	Mr M J Andrews
VA7MIL	Mr Mar
VE7BBX	Mr J Coubrough
ZL4DRB	Mr D Bowie
ZS6PAT	Mr P Lowry

Radio Amateurs' Charity 'Marathon'

The airwaves will be active on 18 and 19 September when UK radio amateurs take part in Transmission, raising money for blind and partially sighted people in need. The British Wireless for the Blind Fund (BWBF) uses the money raised to buy specially adapted radios and internet audio players that enable blind people to access radio shows from all over the world, as well as books, magazines and even shopping catalogues.

Nobby Styles, G0VJG from Cray Valley Radio Society, previous winners of the competition's most contacts made, said: "We stock up on jelly babies and high energy drinks to help keep us going through the night! Club members take it in turns to do shifts over the two days. It can be tough, but the thought that we're doing something to help support this very worthwhile cause really spurs us on."

Last year's individual title was won by Steven Webber who notched up 802 contacts worldwide. The club title was won by the Bittern DX Group, making 1113 contacts over the period. Ron Swinburne raised the most money in the individual section and Bittern DX Group won the club prize.

To sign up and raise funds for a person in need with sight-loss in your area, register for Transmission 2010 by visiting the charity's website at www.blind.org.uk.

Space Colloquium

The 25th AMSAT-UK International Space Colloquium will be held on the weekend of 31 July to 1 August at the Holiday Inn Hotel, Guildford, close to the University of Surrey. A satellite beginner's session will be run by Dave Johnson, G4DPZ, Carlos Eavis, G0AKI and Ivo Kilnkert, PA1IVO, on the Friday afternoon preceding the Colloquium from 3 to 5.30pm.

Hans van de Groenendaal, ZS6AKV will be giving a presentation on South Africa's first CubeSat. The important mission of the SA AMSAT CubeSat is to measure the high frequency noise levels over South Africa and report these measurements back to a ground station for analysis and action to reduce these unwanted signals. The information from the tiny satellite will identify the areas where the HF polluters are situated and will help 'reduce or eliminate the source'. It is also hoped to include a 30kHz linear transponder and an Automatic Packet Reporting System (APRS) in the CubeSat. Details at www.uk.amsat.org/colloquium.

New Licensees in Jersey

Paul Ahier, Steve Huelin and Joe Crowder all took and passed their Foundation licence exam at the Jersey Amateur Radio Society HQ at La Moye in Jersey in June. Also, visitor Eddie Munro, 2M0EMM from Scotland took his Full licence exam while in Jersey on holiday!

Bitterns at Oxburgh Hall

Before twitchers from the length and breadth of East Anglia descend on the stately home near Swaffham in the hope of seeing this elusive bird, we ought to explain that the Bitterns are the Bittern DX Amateur Radio group and they've been involved putting up radio antennas and mounting displays for the public as part of Stately Homes and Castles on the Air and, at Oxburgh, the 'Boys and their Toys' weekend.

Although three stations were activated – HF, VHF and Data – conditions were not favourable for contacts. Only around 200 QSOs were logged, although contacts were recorded with the USA and the Caribbean Islands of Turks and Caicos.

In other ways though, this was a most valuable weekend. Apart from the chance to relax in this idyllic setting, it was a tremendous opportunity to make contact with large numbers of visitors and enthusiasts. They could watch or listen to live QSOs, some opted to try the CW competition, others digested information from the displays or took away promotional literature about amateur radio. What was interesting was how many non-active radio amateurs came along. These were people who had obtained one of the old Class B licences years ago and for one reason or another had allowed it to lapse. None of those who came to the display was aware that their licences could be reactivated and that they would now be allowed to access the HF bands.

Thanks go to members of the group for putting on the weekend and to the National Trust for allowing them to set up in their grounds.

ILLW

Swansea ARS will be operating on the *Helwick* lightship at Swansea Marina on Saturday and Sunday, 21 and 22 August, for International Lighthouse and Lightship Weekend. Final planning will be at the preceding club meeting on Thursday 19th. For details, please contact Roger, GW4HSH on 01792 404422.

Lancaster Bomber Radio

Recently, Ken, G4KCF treated the membership of the Hornsea Amateur Radio Club to a talk on the 1154 transmitter and 1155 receiver as fitted to the Lancaster Bomber and some marine craft. The photographic presentation gave members an indication of what dedication and enthusiasm is required to preserve in working order these icons of history for future generations. Ken also demonstrated the DF facility, which was put to good use when in service. The talk was thoroughly enjoyed by all. Club Chairman, Duncan Heathershaw, G3TLI thanked Ken and presented him with an actual DF loop that will add to Ken's collection.

Edgware Member's Success

Edgware & District Radio Society member Eddie Harman has now achieved his Full licence and is now M0HIE. This is quite an achievement as Eddie, unfortunately, does not always enjoy the very best of health. The picture shows Chairman, Steve Slater, G0PQB with Eddie, M0HIE.

FROM **£16.99**

Remote Operating for Amateur Radio

Get on the Air from Anywhere!

By Steve Ford, WB8IMY

Many amateurs are now discovering the advantages remote operating when confronted with restricted antenna locations or interference issues. *Remote Operating for Amateur Radio* is the essential guide to establishing your own remote controlled station.

Remote Operating for Amateur Radio provides the basics of how the Internet works, how home networks operate and how to interconnect amateur radio hardware and software for remote internet control. This book also addresses the aspects of remote station control, networks and the transmitting & receiving challenges. Readers will find station diagrams, software advice and even tips for activities such as DXing and contesting. If you have restricted operations in your shack or even no shack at all, this book provides solid, practical advice on how to get back on the air remotely.

If you want a guide to getting on the air across the internet *Remote Operating for Amateur Radio* is the ideal solution.

Size 206x273mm, 112 pages. ISBN 9780-8725-9092-2

Non Members' Price £19.99 **RSGB Members' Price £16.99**

FROM **£28.04**

ARRL PIC Programming for Beginners

By Mark Spencer, WA8SME

Microcontrollers control virtually everything we use in our everyday lives, from microwave ovens, remote controls and even electronic tooth brushes. *ARRL PIC Programming for Beginners* is an introductory guide to understanding this fascinating field.

In recent years radio amateurs have become interested in the extraordinary potential of microcontrollers as tools in everything from station accessories to transceivers. *ARRL PIC Programming for Beginners* provides readers with a strong foundation on the subject. Written with a building block approach, this book provides the skills to explore and unlock the potential of these powerful devices. Readers will find that working with PICs can be simple, educational and most importantly fun.

CD-ROM

This book also includes a useful CD packed with programming resources, supplementary reading, short video clips and other helpful data.

If you are interested in learning how to program these highly useful devices and actively put them to work *ARRL PIC Programming for Beginners* provides all that is need to get started.

Size 206x273mm, 256 pages, ISBN 9780-8725-9089-2

Non Members' Price £32.99 **RSGB Members' Price £28.04**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

Club Nets extended

Braintree has been holding regular club nets since the early 1980s, usually on the 2m band. Often there are between 6 and 12 participants. More recently, the 70cm net has been reactivated. The 2m net is on the 2nd Monday of each month; the new 70cm simplex net will be on the 4th Monday. If there is a 5th Monday, the net is held on the club's 70cm repeater GB3BZ.

As an extension to this system, the second half of each Monday net sometimes results in a band change – depending on the month. In October they will visit the 10m band, and hope to visit the 12m band in December. It gives members the chance to dust off some unused rigs or bands, and fill in the log books with some new frequencies.

Via Regia Award

Via Regia is the name of the oldest and longest road link between Eastern and Western Europe. The route connects eight European countries over a distance of 4500km. The Via Regia award is awarded for 100 points worked or heard since 1 January 2010. On short wave contacts with all eight countries (Spain (EA), France (F), Belgium (ON), Germany (DL), Poland (SP), Ukraine (UR), Belarus (EU), Lithuania (LY)) are needed. Each contact counts 5 points. A contact with a station from the German Ortsverband Schöneck Club (F75) or NidderauClub (F31) counts 10 points and a contact with a club station of F75 or F31 counts for 20 points.

On UHF, contacts with stations in the Federal states Hessen (DOK F), Saxonia (DOK S), Saxony-Anhalt (DOK W) and Thuringia (DOK X) are needed. These Federal states are situated along the old trade route Hohe Straße from Frankfurt to Leipzig as section of the Via Regia. Each contact counts 5 points. A contact with a station from the German Ortsverband Schöneck Club (F75) or Nidderau Club (F31) counts 10 points, a contact with a club station of F75 or F31 counts 20 points. A contact with a station from F75 or F31 is mandatory.

The award request with a list of QSL cards can be sent by e-mail to viaregiaaward@googlemail.com. The award is free of charge and will be send in PDF format. A printed A4 format version is available at the cost price of 5€ (please ask for banking information via e-mail). Full details at www.via-regia.org.

Foundation Souvenir

The photo shows Cyril, M6CRE receiving an engraved goblet as a memento of passing the Foundation course from G3RKL. It is a tradition at the Eagle Radio Group that all those successful in passing the course receive an engraved goblet with the Group's logo and their new callsign.

Cyril had often thought about getting involved with amateur radio and eventually contacted his son's next door neighbour who had a large aerial in his garden. Richard, M0RJP suggested making contact with the Eagle Radio Group members. He met Gordon, G4WEC who help him start listening and recommended a visit to the Mablethorpe Town Show where there would be a Eagle Radio Group stand demonstrating radio. Terry, G0SWS and Charles, G0CBM invited Cyril to the next group meeting.

Malcolm, G3ZUI is one of the group's instructors who offered instruction and Cyril is now on his way in amateur radio.

ATC Foundation Licence

Ryan Fiddy obtained his callsign M6ABQ in June. Cadet Ryan is a member of the Air Training Corps with 1132 Squadron in Stalham, Norfolk and he took his Foundation course and exam with the Bittern DX Group. Ryan made 5 contacts on his first time on the air as /A on 2m FM from the Squadron. Two of the contacts were to Terry, G4PSH and Alex, M0PUD, radio instructors at the Squadron as well as Cadet Penny, M6WZK, who obtained her Foundation licence a few months ago.

The Squadron now has seven Air Cadets who hold a Foundation licence and it is hoped that the trend will continue in the years to come.

The Squadron is affiliated to the Royal Air Force Amateur Radio Society and from time to time the cadets assist at the Permanent Special Event Station GB2RAF at the Air Defence Radar Museum RAF Neatishead, Norfolk under the supervision of Terry, G4PSH.

Club President Retires

After many years of outstanding service to the Waterside New Forest Radio Club, John Daw, BEM, G0UUW, is retiring from the position of Club President. In June, a club social function was held at the Jubilee Hall in Fawley village, in order to celebrate John's achievements and present him with a classic Morse key and accompanying plaque.

John led an eventful working life, largely concerned with radio communications. In January 1938 he joined the Royal Signals in the British Army, and soon found himself, in 1939, as a signalman on a military mission to Poland. However, incursions by the Germans necessitated a move back to Romania and, eventually, to Alexandria in Egypt. Back home in the UK, he was attached to the Second Armoured Brigade, and in 1940, found himself in France. He was moved from there back to the UK. In 1941 he moved to the Libyan desert and, in 1942, to the famous El Alamein. In 1943 he was sent to join the campaign in Sicily, Italy, where the German army was fighting tenaciously to hold ground against the Allies. Eventually, in 1945, he was sent to Austria, from there to Tyne Tees in the UK and, when a new division was formed, to Germany. From there he was demobilised in 1946, and spent four years on the Military Reserve. During this time as a civilian he started a small electrical business but, in 1951, the army was calling for suitable people to train recruits of all ranks in technical matters, particularly radio relay equipment, so John rejoined the Royal Signals. He was a signalman for three months, then was rapidly promoted to staff sergeant. He became a member of the training staff at the Royal Signals establishment in Blandford Forum and eventually retired from the army with the rank of major in 1974.

Once more in civilian life, he joined Sony in West London, and worked on radios and televisions until 1984, when he finally retired. He hopes to make contact with a Royal Signals Organisation in his new home location, and thus continue his association with people in the radio world.

Happy Birthday

Peter, G3VNH and Julia, M3VNG recently attended the 80th birthday celebrations of Fred Robins, G3GVM. Fred has been a member of the RSGB for over 50 years. At the celebration, Fred's family, Anthony, Sarah, Vinny and Molly, were there as well as several other radio amateurs.

South Birmingham Exam Success

The photograph shows John Willby, M6JWY (left), who only passed his exam recently, acting as invigilator at another exam session at the South Birmingham ARS. The successful candidates this time were Beverly Price and Gemma Gordon, shown with instructor Dave Murphy, G8OWL (right).

More 2E0 callsigns in Bristol

South Bristol Amateur Radio Club has had further success in the Intermediate Examination. Three more members now have 2E0 callsigns.

The transition to the new Club premises is now complete and much work has gone into building the shack / internet computer room. An impressive array of external aerials has produced excellent DX results. A recent innovation is the establishment of a tea bar, where members can partake of free tea, coffee, biscuits and crisps.

The photo shows members enjoying this facility.

VQ4RF

In the last issue we published a request for information about the late VQ4RF. His daughter, Mary, writes that she has had three replies so far from members and she says, 'I cannot thank you enough on behalf of my sister and myself for the trouble that you have gone to'. As children, Mary and her sister remember the many hours that their father spent in his shack. If you have a QSL card or memories of VQ4RF please get in touch with Mary Hind by e-mail to marycorn1@yahoo.com.

Gerry Wells on BBC World Service

Dan Shepherd recently finished making a little radio documentary about Gerry Wells for the BBC World Service. It is due to be broadcast at 9am BST on 20 August. It is best to check the BBC World Service website nearer the date just to confirm, as the schedule can be liable to change. More info at www.fallingtree.co.uk/in_production/4/the_wireless_world_of_gerry_wells

All Students Progressing

Hinckley Amateur Radio and Electronics Society wish to congratulate the candidates who passed their recent Intermediate exam. All candidates have registered for the Advanced course, which commences on 25 August. There are still a few spaces if anyone else is interested in this course; details can be found at www.hares.org.uk.

The successful candidates, left to right, are Phil, 2E0PCH, Ellen, 2E0ELL, Wayne, 2E0WARM and Jez, 2E0RMJ.

GG100GGR

Members of the Scouts & Guides Amateur Radio Club (MM0TSG) recently activated special event callsign GG100GGR on behalf of GirlGuiding Greenock Division Centenary Camp, which was held at Ardgowan Estate, Inverkip. The station was active on HF and VHF. Despite some minor problems with the site generator, they made 237 QSOs across 15 countries. There were 200 Guides camping and over the weekend many of them were able to send greetings messages over the airwaves.

The HF station was operated in the main by the youngest Scout radio operator – 14 year old Stephanie McCann, MM3YGE, assisted by Kai McClintock, MM1AUF (Scouts) and Eunice Lynch, MM3UVL (Guides). On VHF part of the time were Guide operators Kathryn McBride, MM3YQX and Jenna Sinclair, MM3YSJ. On hand to provide technical advice and guidance where needed were Scout Fellowship operators George McClintock, GM8YUI and Bob Lynch, MM1AWV.

The weekend was a major milestone for Stephanie who was able to operate her first HF station under supervision and proved adept at handling the pileups the special event callsign generated. She was complimented on numerous occasions for her good operating skills. Thanks to all the operators who contacted the station.

The club is always happy to welcome new members who share an interest in amateur radio and Scouting, Guiding and/or youth activities. They operate from St Ninian's Church Hall in Gourock, Inverclyde which is their primary location and exam centre, as well as from their second location Greenock & District Scouts HQ.

Did You Know G3BNL?

Graeme Healey is currently doing research into my late grandfather, Leslie Sharrock, G3BNL, now a silent key. Do any Members have information on G3BNL? Graeme is especially interested in tracking down photographs. If you think you can help, contact Graeme Healey, 3 Hailes Road, Gloucester GL4 4RB.

Searching for PLT Interference

There is still time to enter the EMC Industry Association's 'contest' to identify the interference range of Power Line Telecommunications – otherwise known as PLT, PLC or BPL.

Competitors must demonstrate the presence of interference from a distant PLT installation – which might for example, comprise Comtrend, BT Vision or Belkin Power Line Adaptors. By so doing they will help advance the technology of interference measurement and maybe win one of the two prizes of VR120 wide-band hand-held receivers, kindly donated by Yaesu (UK) Ltd. Entries must be received by Monday, 6 September 2010.

For details of the rules and how to enter go to www.emcia.org/news.aspx. For technical support and in-depth information about PLT go to www.theemcjournal.com.

Plasma TV interference

The international standards committee responsible for EMC matters, CISPR, has launched an information gathering campaign, specifically aimed at determining the extent and seriousness of interference from plasma TV receivers.

Initially they have asked National Standards organisations for this data, and in our case in the UK, BSI contacted our Regulator, Ofcom.

They posed the simple question, 'How many complaints have there been'? Ofcom indicated that they only had received 12 to 15. Over the last few years, the EMC Committee has received many more complaints from members, but no recording system is in place. So, we now need your help!

If you have suffered, or are suffering now, from interference from a plasma TV receiver we need to know. All that you have to do is send a very brief e-mail to plasma.tv@rsgb.org.uk. We only need to know the number of interference cases, no details, and no names/addresses. Please act as soon as possible, since the timescale for gathering this information is very tight.

BATC Amateur Television Contest

The IARU Region 1 International Amateur Television Contest takes place from 1800UTC on 11 September until 1200UTC on the 12th. Operation is fast scan, on all bands from 70cm upwards. The video exchange is the callsign and 4 digits. The phone exchange includes the report, serial number and locator. Details and full rules are on the web at www.batc.org.uk. Contact Dave Crump, G8GKQ by e-mail to contest@batc.org.uk for more details.

Intermediate Exam at Chelmsford

In June, the Chelmsford Amateur Radio Society held an Intermediate exam. It was the culmination of an 11 week course during which the candidates enjoyed a good mix of tutorial and practical work. The conversion rate from Foundation to those taking the Intermediate is usually high within CARS, but in this instance it was 100%. Even better, all but one (who dropped out of the course due to family reasons) passed the exam. Almost all have stated their interest in the Advanced Course in the latter part of the year. To find out more about CARS courses speak to Clive, G1EUC on 01245 224577.

The Joy of Going Portable

Bob Palmer, M3DQP, gave a very interesting talk to the Milton Keynes Amateur Radio Society on the joys of going portable and how to set about it. He demonstrated and described various antennas and other pieces of equipment that he had collected over the years. Bob is a great believer in portable operation and runs event stations for the MKARS club throughout the summer months. The essence of his talk was that anyone could go portable using low power, wire antennas and the minimum of equipment using bands that they, maybe, would not be able to use at their home QTH.

NEWS IN BRIEF

• Wrexham Amateur Radio Society has moved. It now meets at Brymbo Sports and Social Complex, College Hill, Tan-Y-Fron, Wrexham LL11 5TF. The new venue will allow the club to expand by increasing the membership and will, hopefully, allow them to run a few more on the air nights.

• Jersey VHF repeater GB3GJ is on the air on 145.637.5MHz with 71.9Hz CTCSS. Signal reports are being welcomed from Jersey, other Channel Islands and beyond. More information is available via QRZ and the Jersey Amateur Radio Repeater Group website at www.radioclubs.net/GB3GJ. The committee of JARRG would like to express their thanks for the efforts, donations and time donated by the group members as well as local companies who have provided materials and components.

• Glenrothes & District Radio Club has moved its main operating shack to the Scottish Secret Bunker but continues to meet on Wednesday evenings at the New Pavilion in Thornton. Details of how to get to the club house and contact details are on the website, www.gdarc.org.uk. Club member, Doug, GM0AIR operates the Morse Enthusiasts Group Scotland as GM0RSE on Mondays and Thursdays at 1800 UTC on 3530 ±QRM.

• HamCalc version 122 was released on 17 June. For a free download go to cq-amateur-radio.com.

• M0CVO Antennas has now left Norfolk and has relocated to the quiet market town of Grantham in Lincolnshire. They will still be providing the same antennas for HF, VHF and UHF via the website and eBay store, and the same customer service. They will also be at the National Hamfest on 1 and 2 October. The M0CVO HW-40HP is reviewed in this issue's Antennas column (p42). For more information see www.m0cvoantennas.co.uk.

• Friskney & East Lincolnshire Communications Club has a new website address, www.felcc.com. More information on the club from Chris, M0MFP by e-mail to creedmfp0@hotmail.com.

• Plymouth Radio Club has a new meeting place at The Cherry Tree Public House, Ham Drive, Plymouth PL2 3NT. The Cherry Tree is situated at the Peverell end of Ham Drive, less than 100 yards from the junction with Outland Road. The main car park entrance is on the left of the pub as you look at it. There is plenty of parking space and just a few steps down to the entrance. The entrance on the right leads into a small car park for disabled drivers and has level entrance into the pub. There is a room for the club to use and this has been reserved for the second Tuesday of each month until the end of the year. 14 December is provisionally the Christmas Party evening. The bar, which serves food and all other facilities will be available to club members.

RSGB shop

NEW

Virtual Radar Explained

By Mike Richards, G4WNC

Virtual Radar Explained covers the world of aeronautical Virtual Radar which is the common name given to the reception and plotting of ADS-B transmissions from aircraft. The use of ADS-B by commercial air traffic has revolutionised the amount of information available to aviation enthusiasts and this unique book covers the subject from just about every angle.

Virtual Radar Explained provides full details and shows how to get the most from all of the mainstream hardware and software offerings including: *AirNav Radarbox*, *Kinetic SBS-1*, *PlaneGadget* and *PlanePlotter*. There is also coverage of how to install effective antennas and feeders for Virtual Radar systems. For home-brew fans, there is information on the "build your own" options that are available via the internet, along with an explanation of some of the technicalities of ADS-B reception. *Virtual Radar Explained* is a very comprehensive book will be of great interest to all the aviation enthusiasts and existing users of Virtual Radar alike.

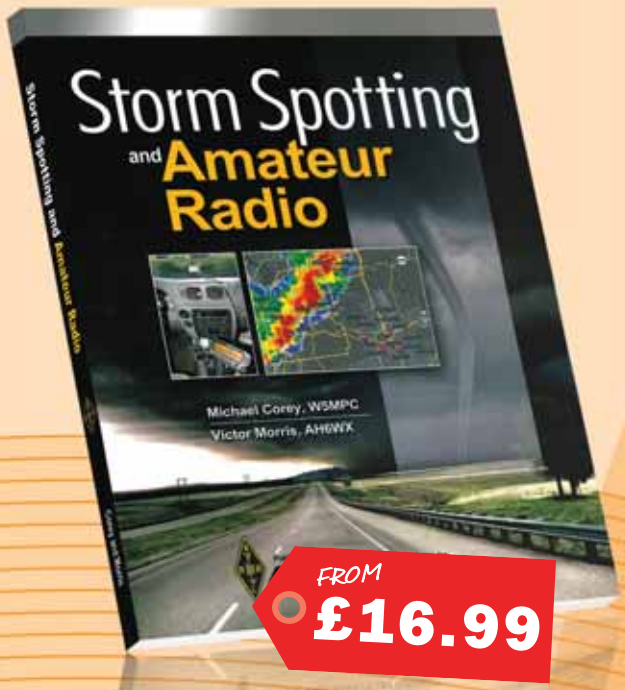
Size 174x240mm, 64 pages, ISBN 9781-9050-8660-3

Non Members' Price £6.99 **RSGB Members' Price £5.94**

Storm Spotting and Amateur Radio

By Michael Corey, W5MPC and Victor Morris, AH6WX

This book is aimed directly at those who are interested in tornados and other severe weather phenomenon. Using the assistance of thousands of volunteer storm spotters the American SkyWarn® program of the National Weather Service provides a first line of defence against severe weather. Many amateur radio operators are trained storm spotters and this book includes information on resources, training and equipment available to them. The book starts with a straightforward introduction to the subject moving to practical safety information for this hazardous activity and details of what to expect. There are extensive guides to meteorology and hurricanes and storm spotter activation procedures. Readers will also find reportable weather criteria, how to develop a local storm spotter manual and the experiences of storm spotters from around the US. Thoroughly recommended reading for those interested in all severe weather, including hurricanes, tornadoes, hail, floods, damaging wind and winter weather.



208x274mm 160 pages, ISBN 9780-8725-9090-8

Non Members' Price £19.99 **RSGB Members' Price £16.99**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

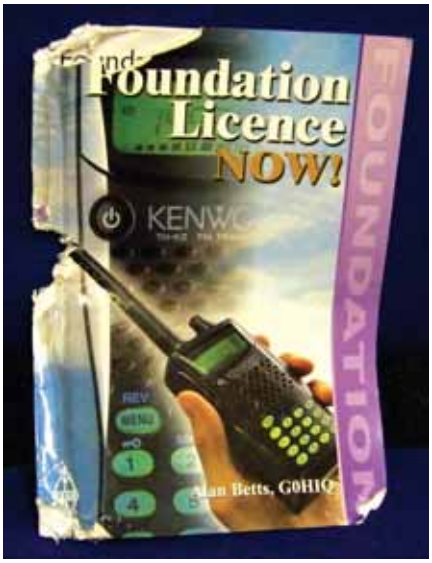
Donate online at www.rsgbshop.org
Spectrum Defence Fund

Total Success

North Wakefield Radio Club is pleased to announce a 100% success rate at the recent exam session. Left to right is Chris, M0PGE, Michael, M0MDA and Roger, M0XPT.

Ulster Passes

Congratulations to the newest Foundation candidates to pass in the Mid Ulster Amateur Radio Club. The candidates have thanked the members and Instructor Alex, MI0MVP who gave up a weekend to complete another successful course and exam. One candidate, Rodney, faced unusual odds – the photograph shows the state of his course book after his two dogs had finished with it!



Martime Software

INTERMAR, the German Maritime Mobile network, have produced some software specially enhanced for sailors and written, which provides the opportunity to APRS position report, send short APRS e-mails, weather reports and so on.

Amateur radio live uses 10.147MHz USB the worldwide PSK APRS. Information and downloads can be found at www.pskmail.de and www.pskmail.eu.

25 Years RAYNET Service

Former RSGB Council Member, Mike Shread, G6TAN was presented with his long service 25 year certificate by RAYNET National Chairperson Cathy Clark, G1GQJ at Thames Valley Police Headquarters. Cathy took the opportunity to surprise Mike with the presentation whilst they were both present for a meeting of the Oxfordshire Emergency Planning Responders at Kidlington.

Over the years Mike has worked with several RAYNET Groups including North London, Milton Keynes, Grampian and Oxfordshire. He was an RSGB Council Member.

Scarborough Courses Available

The Scarborough Amateur Radio Training Group is the tuition section of the Scarborough Amateur Radio Society. Courses are held at Crossgates Community Centre Tuesday evenings, 7pm to 9pm. Their next course will held later in the year and will be at Advanced or Foundation level depending on demand. For further details contact Robert Clutson via e-mail at g0wh0@amsat.org or Bob Alders via e-mail at bobm0gap@btinternet.com.

The photograph shows a group of students with their pass certificates after being successful in obtaining their Intermediate amateur radio licence. The students attended a sixteen week course held at Crossgates Community Centre by Scarborough Amateur Radio Training Group.

Greater Manchester West Guides

In May, members of Bolton Wireless Club operated GG100GMW for the Greater Manchester West Guides centenary camp at Tatton Park, Cheshire. The station was operated on 2m and HF, allowing dozens of Guides to send greetings on the air, and earn their Guides On The Air badges. Table-top Morse practice was a very popular activity too. Special QSL cards designed by the Guides themselves will be sent out to the 61 contacts (in 11 countries), including OZ2SPACE (a rocket project in Denmark), GG100GGR (the Renfrewshire Guides), SK0SAS/AM (a Swedish 737 cargo pilot operating Aeronautical Mobile), GB2LD (the Marconi Museum in Cornwall). The Guides had a really good weekend and were very excited to be able to talk on the radio and said that they would love to have the club back for future events.

Ten-Tec Extra

To mark the fact that W&S are now distributing Ten-Tec products in the UK & Ireland, the Ten-Tec factory have offered to supply a Regal desk microphone valued at £130 free of charge with every new Jupiter, Omni or Orion transceiver purchased from Waters & Stanton from July to October 2010.

The retro style microphone will be supplied with a desk stand and appropriate connecting cable.

NEWS IN BRIEF

• Tony Pole-Evans, VP8HZ has passed away in the hospital in Stanley in the Falkland Islands on 8 July. He was 90 years old, the oldest man in the Falklands and I have known him for over 40 years. He kept in contact with me daily during the conflict in 1982, passing lots of military info etc. When I had my trip down to meet him, I was told by some of the Ministry of Defence staff that our information was all they had of Argentine troop movements in the first week. Tony continued to pass messages every day during the war and was a quiet unassuming person who said he just did his bit. He will be buried back on his home on Saunders Island in the West Falklands. Les Hamilton, GM3ITN

2010 Field Day by Peter Rivers, G4XEX

The Welland Valley Amateur Radio Society held its annual field day event on 20 June at Rupert's Viewpoint on the boarder of Northamptonshire and Leicestershire. The special event call sign GB0BON standing for the Battle Of Neseby had been obtained from Ofcom and permission to use the site had been granted by one of the trustees of the Naseby Battle field. For those interested in the history of the Battle of Naseby, it took place on 14 June 1645 and was the decisive battle of the English Civil war. Details can be found at the trustees' website (www.naseby.com)

The previous two WVARS annual field days at Rupert's Viewpoint had both been fun and a great success, although on each occasion one small detail had let us down. That was the weather. Although we always held the field days in mid summer, the 2008 and 2009 had both been cold and wet. This year though we were well prepared. The club had purchased a sturdy new gazebo with removable sides and everyone had wellington boots and jumpers on standby. As things turned out though, the wellies and jumpers were surplus to requirements. 20 June was a 'stonking' hot day without a cloud in the sky. The gazebo on the other hand was more than welcome, not as a shelter against the wind and rain but as protection from first degree sunburn and heat stroke!

We thought that we had covered everything. The club radios, antenna tuning units and antenna had been tested the previous weekend and were running OK. The generator had been run up and was working fine. The evening before the laptop-logging program had been put to the test and found to be working perfectly. The new gazebo was put up and found to be spot on. What could possibly go wrong? Answer, lots of things.

Problem number 1. The club's radio, a Yaesu FT-450, chose this weekend to break down after many years of sterling service. No receive audio, and despite many attempts to coax it back to life it remained stubbornly quiet. No great problem though as Colin the club chairman was despatched home to pick up his own FT450.

Problem number 2. After returning with FT-450 in hand and plugging it all in it was discovered that, for reasons we were unable to work out, that the club's Windom antenna was refusing to load up on anything except the 20 and 40 metre bands. This time I was dispatched back home to pick up the G5RV antenna that the local Market Harborough Girl Guides had built for their Thinking Day On The Air.

Problem number 3. The club Windom antenna was lowered and the Girl Guide manufactured G5RV antenna raised. It was at this point that someone noticed that the PL259 connector on the coaxial wire that connected the radio to the antenna was just hanging on by a thread. A quick bodge job and again we tried to get a signal out. It was at this point we began to wonder what else could go wrong as we could still only load up the radio on 20 and 40m bands.

Problem number 4. For some reason the laptop computer was refusing to talk to the radio (or should that be the radio was refusing to talk to the laptop). Whichever way it was the pair of them would not communicate. This meant that manual log keeping would be the order of the day. At least this did not require another trip home as a paper log had been brought just in case of a problem like this.

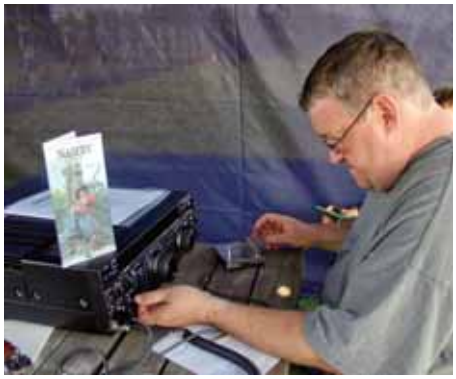
It was then that our luck changed by way of a saviour called Steve, G4EOF. He turned up at the site and to our relief just happened to have his Yaesu FT-1000MP radio with built in antenna tuning unit in the boot of his car. At last we were on air and on every band from 80 to 10 metres with no gaps.

By 9am we were up and running. We spent the morning on the lower bands and had many nice contacts with other stations round the UK. It was Museums on the Air weekend and we managed to work quite a few of them.

At about 1pm we ventured up the bands and settled on 20m. It started off quietly enough and we were having fun exchanging details with stations. However at some point we think that someone must have posted us on the DX cluster as all of a sudden all hell broke loose and at the end of each contact we were met by a wall of S9+20 noise. In the next three hours we rattled off no fewer than 160 contacts. OK not a great rate for a contest station but for a special event station it was quite a rate of QSOs.

By 4pm things had settled down and we decided to let Steve loose with his Morse key. A few more contacts were made before we closed the station for the day.

All in all we had a really good field day and I think everyone went home happy. All I have to do now is design a QSL card, get it printed and sit down and write them all out. Darn that laptop for not auto logging the contacts!



NEWS IN BRIEF

• Newbury & District ARS have frequently worked with the Vulcan Bomber based at RAF Lyneham. Recently an interview was recorded with Chief Engineer Taff Stone, who is the overseeing the maintenance schedule of the aircraft. You can hear the interview (recorded by Helen Ainsworth from Newbury Sound) and review some of the photographs taken by Maria Dobson from Thatcham Photographic Society. The radio interview was broadcast on BFBS. Details at http://www.newburysound.co.uk/history-back-to-life-i-6248.php.

HF bike mobile 2

More technical information on this way of operating

PHOTO 1: General view of the bicycle mobile system's latest developments.

INTRODUCTION. After reading my original article on bike and pedestrian mobile in the March *RadCom* several people asked me for a more technical description of my HF bicycle setup.

FUNDAMENTALS. The basic requirements for bike or pedestrian mobile are similar. These are an antenna system suitable for operating whilst on the move, a stable and efficient ground system and sufficient DC power to run it all. Then there are additional considerations for getting the best performance while on the move.

ANTENNAS. Several different homemade antennas are used on the bike. I usually carry at least three in a long red bag on the side, the choice depending on upon the bands I want to use and the expected propagation. The bag is quite evident in **Photo 1**.

On 10m the antenna is a full sized quarter wave. Monoband centre- or top loaded antennas cover 15, 17 and 20m. Centre and top loading is used to reduce induced RF losses into the frame of the car, bike or backpack and to minimise body capacity effects. It also gets the aerial current higher up the antenna. The antennas are generally 2.5 metres long, constructed in two pieces for easy transport on the bike. The total parts cost for each antenna is around £10.

The lower part of the antenna is constructed from a 1.2 metre long piece of 10mm hollow aluminium tubing, which is available from large DIY outlets. This is permanently attached to the centre loading coil. I chose my coil diameters to provide maximum Q whilst not being too top-heavy. The coils consist of 5mm insulated stranded wire wound onto 75mm diameter plastic drainpipe and covered with heatshrink to keep the weather out. On 15m I use 8 turns; the coil is 75mm long. For 17m it's 12 turns and 90mm long. The 20m version has 20 turns and the coil is 100mm long.

The top section is a stainless steel whip, which is threaded onto the coil section and is removable. The complete antenna weighs only a few ounces and hence is ideal for operation whilst on the move. It has very low wind resistance, too, so is suited to adverse weather conditions.

When weather conditions permit, I can also operate with a top loaded vertical, which is more efficient, however it is a total of 3.6 metres long and can be difficult to control in windy conditions! The construction is identical to the centre-loaded vertical but uses an additional 1.2 metre length of aluminium tubing at the base, which is threaded together to the centre loaded vertical. The top section of stainless steel whip is slightly shorter to maintain resonance. This antenna is shown in **Photo 2**.

The lowest sections of the antennas have a piece of 3/8" threaded bar inserted into the hollow aluminium tubing. This is crimped and a locknut fitted to prevent it coming loose. The antenna then screws into a standard antenna mount fitted to the bicycle (**Photo 3**). Immediately below the mount is a two way aerial switch. The other side goes to a 6m telescopic fishing pole that is permanently fitted to the bike and carries a centre loaded wire for 40 and 80m. I only use it on calm days.

SETTING UP THE ANTENNA. Tuning a newly-built antenna is important for best performance, but this is not done on the bike or portable. Instead, I set the antenna up over an ideal ground plane of four raised, resonant radials. I use an antenna analyser and adjust the length of the top section and/or remove or add turns to the coil until I get the best 50Ω match at my desired operating frequency. Once this is done, the antenna doesn't need further adjustment.

GROUNDING. The ground plane is the 'other half' of an antenna system. It can be thought of as the mirror image of the vertical. The complete radiated beam only forms several wavelengths from the antenna so a large ground-plane like the sea is ideal – it certainly increases the performance dramatically. The antenna will also have a very low angle of take off, which is very beneficial when working DX.

Our problem is to create an effective mobile ground plane for the vertical antenna to work against. The frame of the bike or trolley is very limited in size and of course has to be truly mobile. It is impossible to create a full size ground radial system or indeed have a fixed earth of any description on either a bike or a pedestrian trolley.

A few years ago I came up with a simple solution. The frame of the bike, backpack or

PHOTO 2: The centre-loaded 20m antenna is typical of my construction. Inset left: detail of the antenna mounting screw.

PHOTO 3: Aerial switch located immediately underneath the main aerial mount.

PHOTO 4: The primary pair of 7AH batteries that provide power to the radio.

trolley is resonated and produces a capacitively coupled ground plane to the surrounding area. This is very effective when operating over a high conductive ground like the sea shore. This method of frame tuning also ensures a more stable antenna match whilst on the move and eliminates RF feedback/instability even at very high power levels.

GROUND TUNING UNIT. The GTU is used on all bands with all the antennas. It is essential for good performance, as it creates the 'other half of the antenna'. It consists of an adjustable series-resonant LC circuit and is capable of covering all the HF bands.

By the nature of its inherent adjustability, the precise design of the GTU isn't critical. My original used switched capacitors and a roller-coaster inductor but **Figure 1** shows an equivalent using a tapped coil and variable capacitor. The coil is 24 turns of 5mm wire on a 2.5" (63.5mm) plastic former, tapped every other turn. The 300pF capacitor provides fine tuning.

The GTU is placed between the braid of the coax cable at the aerial end and the frame of the bike, backpack or trolley. A simple RF sampling circuit (**Figure 2**) is used to feed to a small meter to measure the ground or frame current. It is loosely coupled to the earth feed to the frame, and the GTU is adjusted for maximum current reading on the sampling meter.

IN USE. The VSWR and input impedance can be near ideal over high conductivity ground, eg near to salt water. The performance of the system is very dependant upon location. When operating close to the sea the ground current is very much higher than it is over average ground. Adjustments to the GTU have to be made depending on the terrain.

POWER SUPPLY. The Alinco DX-70TH that I use requires 12V DC at up to 20A peak on SSB. In order to provide sufficient current for at least two hours' continuous use, I have two pairs of parallel-connected 12V 7AH gel cell batteries. The primary pair is attached to the crossbar (**Photo 4**); the second is in a metal box on the rear of the bike. These can be switched in to extend operating time.

MORE POWER. Additional RF power (if required) comes from a dedicated trailer, see **Photo 5**. This has an Italian KL-500 linear amplifier that outputs around 250W PEP. A 12V 80AH battery on the trailer provides power for up to 4 hours.

CHOICE OF EQUIPMENT. When on the move it is essential to have simple but efficient radio equipment. A simple headset means you can keep your hands free to ride. Simple-to-operate equipment like the Alinco DX-70TH is ideal, as it has very few two-function buttons or menu operation to contend with. Low standby power consumption can also be an important consideration.

BEST PERFORMANCE ON THE MOVE. There are a number of key factors for getting the best performance when using portable systems. Location is crucial. Being very close to the sea can give a 15-20dB

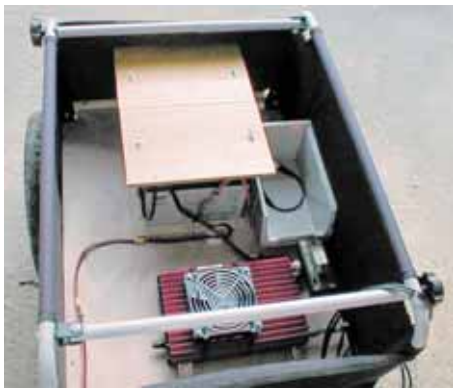


PHOTO 5: Inside the trailer there's a 250W amplifier and (under the wooden cover) 80AH of battery power.

increase to receive and transmitted signals. Use centre- or top loaded monoband antennas for maximum efficiency; large, high Q coils help minimise losses. It's important to optimise your ground and antenna current too. There is no substitute for knowing which band and what time to work a certain area. Using propagation prediction programs like VOA Prop for guidance and operating during grey-line times is a distinct advantage.

MORE INFORMATION. Several clubs have been kind enough to invite me to talk about my bike and pedestrian mobile operation. There is a description of my latest endeavour – a completely solar-powered pedestrian setup – in this month's QRP column. You can also find more information on my achievements on the web at www.qrz.com/db/g4akc.

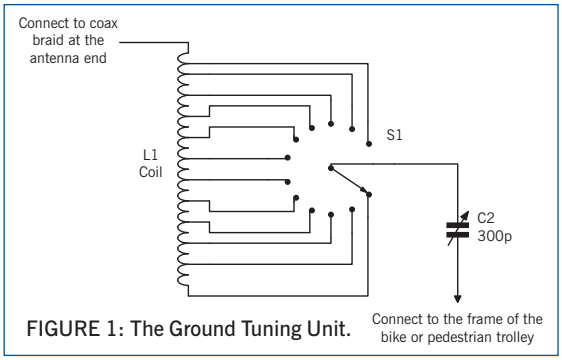


FIGURE 1: The Ground Tuning Unit.

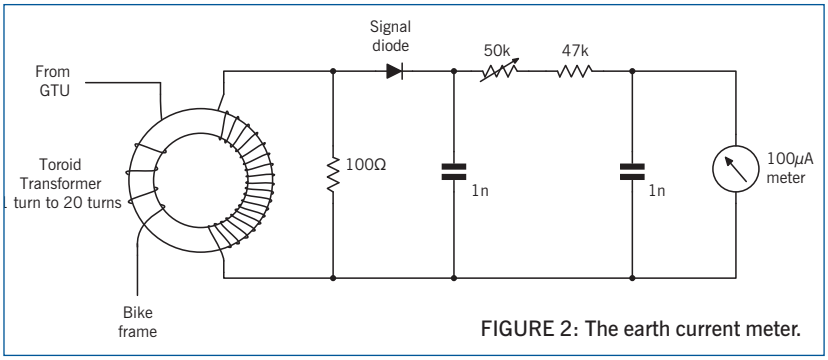


FIGURE 2: The earth current meter.

Homebrew

We continue the VHF synthesiser project

A QUICK ASIDE. Before we start on this month's project, I will take a few minutes to describe a simple 'poor man's spectrum analyser' that can be used for close-in spectrum analysis of VHF oscillators. This instrument was built for checking the spectral purity of the VHF DDS/PLL synthesiser from last month's Homebrew. A similar method of spectrum analysis was used to test the IF filters for the simple superhet receiver in Homebrew for February-April 2006. The circuit is functionally identical to a direct conversion receiver. The VHF signal from the equipment under test is mixed with the output from a VHF local oscillator. A simple RC low pass filter removes any RF from the output of the mixer, leaving only the audio frequency difference signal. A standard diode double balanced mixer is used for the VHF to AF conversion. The audio signal is amplified and then sampled using a PC sound input so that it can be analysed using spectrum analysis software.

The schematic is shown in **Figure 1**. The key component is the local oscillator. This is a combined 3rd overtone (OT) crystal oscillator and frequency tripler. If a 45MHz 3rd OT crystal is used, the output from the oscillator will be 135MHz. When the VHF synthesiser under test is tuned to 145.7MHz, its output frequency will be 145.7-10.7=135MHz. Tuning the synthesiser a few kHz above or below this frequency will produce a 'beat note' in the audio frequency range.

CONSTRUCTION. The circuit was built dead-bug style on a strip of PCB laminate. I used a BF199 (Maplin N79AF) transistor in the oscillator. Other NPN VHF transistors like the 2N2369 would be equally suitable. L3 is 10 turns of enamelled wire on a small slug tuned former. My 45MHz crystal requires about 0.8μH of inductance to tune it to resonance. You can use a fixed inductor instead, but you would lose the ability to fine-tune the oscillator frequency. L1 and L2 are each 6 turns of 1mm wire wound on a 5mm former. The turn spacing is approximately the same as the wire diameter. L2 has a tap at 1.3 turns from the grounded end. I used the centre core from 75Ω TV co-ax as a source of 1mm copper wire. A 5mm drill was used as a temporary former. You can use a commercial diode mixer or a home made DBM as the mixer. I tested a home made diode mixer and a packaged SBL-1 mixer in this circuit. A ring of four 1N5711 Schottky diodes was used in the home made mixer. The mixer I/O transformers are each 4 turns of enamelled wire, trifilar wound on a FT37-61 ferrite core. The AF amplifier is a simple common-base circuit using a BC547 transistor.

TESTING. Always take care when connecting home made equipment to your PC sound card inputs. Most sound cards have capacitively coupled line inputs which can cope with several volts of DC or AC without suffering any damage. Accidentally applying higher voltage levels could damage your sound card or PC mainboard.

I used the 50Ω step attenuator from April 2010 to control the level of the 135MHz signal from the VCO unit. This signal is applied to the RF port of the diode mixer. The AF output is connected to the PC line input. The VHF synthesiser was tuned to a frequency of 135.00125MHz. This should produce an audible beat note of 1.25kHz. The first test resulted in a very weak and high pitched whistle of around 5kHz. L3 was adjusted to bring the output frequency to 1.25kHz. The two 22pF trimmers associated with L1 and L2 were adjusted for maximum audio output. I needed to use at least 20dB of attenuation between the VHF synthesiser output and the mixer input to achieve a clean output signal. The measured output is about

PHOTO 1: A homebrew 23cm GaAsFET preamp with a quarter wave cavity input circuit.

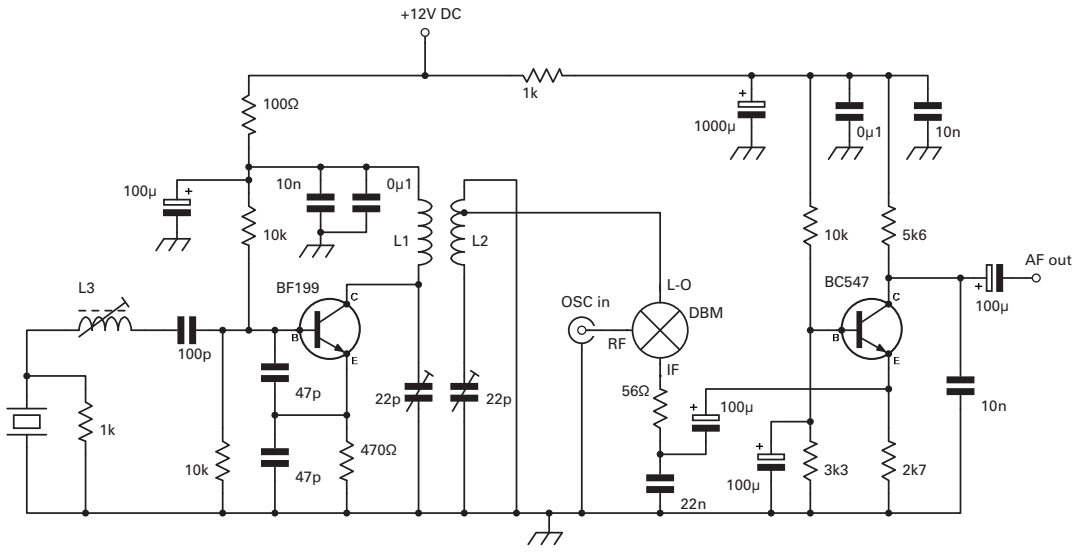


FIGURE 1: Poor man's spectrum analyser for close-in testing of VHF oscillators.

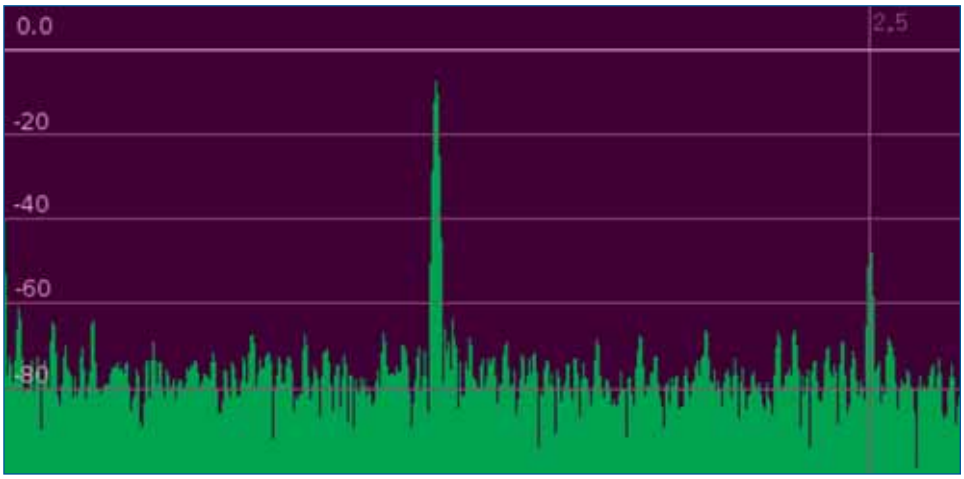


FIGURE 2: Screen capture of XAnalyser spectrum analyser.

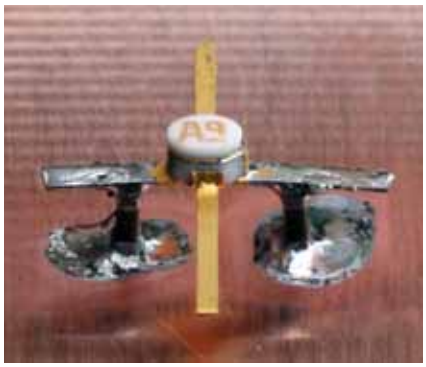


PHOTO 2: How the MGF1302 transistor is mounted on its decoupling capacitors.

500mV pp and looks like a perfect sine wave on the oscilloscope. **Figure 2** shows a screen capture of *XAnalyser* **[1]** running on my Linux PC. Similar spectrum analysis software is available for Windows and Mac OS. This plot shows that close in noise and spurs are below the noise floor, which is at -60dBc. Mounting the analyser in a screened enclosure and powering it from a 12V battery improves the usable dynamic range to about 70-75dB. The noise at the left (LF) of the plot is caused by 50Hz mains pickup, the signal at 2.5kHz is a harmonic of the output frequency and not a spurious signal from the VHF synthesiser. Note that *Xanalyser* plots are 20dB per division instead of the more commonly used value of 10dB/div.

A VHF FRONT END. Now that we have a working VHF synthesiser and a tried and tested IF/AF back-end design from the LF receiver project, the next logical step is to build a VHF front-end. The benchmark for amateur 2m receiver preamps is the BF981 dual-gate MOSFET. Many amateurs have built excellent BF981 preamps with 20dB+ gain and a noise figure of below 1dB. The BF981 data sheet suggests that a NF as low as 0.7dB can be achieved at frequencies of up to 200MHz. This level of performance is more than adequate for all but the most demanding applications. Lower noise figures can only be justified for EME (moonbounce) and extreme weak signal working. If you are lucky enough to live in a very quiet location and you have a fairly high gain aerial, it is possible that you may benefit from having a lower noise figure. EME stations use large aerial arrays that are usually pointed at cold sky and away from sources of man-made noise. This can lead to a situation where receiver sensitivity is limited by noise generated within the receiver rather than noise received from external sources. State-of-the-art preamps based on GaAsFET (Gallium Arsenide) and HEMT (high electron mobility transistor) devices can offer noise figures below 0.3dB at 144MHz. Some designs claim to have even lower noise figures in the 0.1-0.2dB region, although it must be extremely difficult to measure the NF of such an amplifier. Losses in the co-ax lead and connectors between the amplifier and test system would make a substantial contribution to the noise figure.

RF GaAsFET and HEMT devices are not high street items. Specialist suppliers like GH Engineering and Barend Hendriksen sell a good range of suitable devices. Popular devices include Mitsubishi GaAsFETs like the MGF1302 and HEMTs like the Agilent ATF-54143. Prices are typically around £4-5 per device. Less popular devices from NEC, Siemens and Fujitsu are often found on auction sites like eBay for less than £1 per device. Old satellite LNBs are a good source of low noise microwave transistors at little or no cost.

MOSFETs like the BF981 and similar devices are relatively easy to work with. The input match required for maximum gain, best input SWR and best noise figure all tend to coincide quite closely. All the designer has to do is to determine the optimum input impedance from the device data sheet or by experiment and then design a suitable matching network. Life is a little bit more complicated when working with microwave GaAsFETs. These devices are often designed to provide a useful amount of gain at 10-12GHz. Such transistors will have extremely high gain at 144MHz, possibly as much as 30-40dB. The input match that provides the maximum power gain or the lowest input SWR is not necessarily the same as the optimum input match for lowest noise figure. This is not a big problem in practice because typical devices have much more gain than we would need in a 2m preamp. I am quite happy to trade some of this gain for an improved noise figure or, if you prefer, a better output signal to noise ratio.

At low frequencies, the input impedance of a GaAsFET looks like a very high resistance in series with a large capacitive reactance. The impedance falls to a few tens of ohms at microwave frequencies. At frequencies of several GHz, the gate reactance swings positive as the gate capacitance resonates with the input lead and bonding wires.

The Smith charts and tables in the MGF1302 data sheet shows the input reactance crossing the zero line at around 8-9GHz.

The challenge for the circuit designer and constructor is to produce a matching network which can match this rather awkward input impedance to a 50Ω feedline without introducing excessive losses. The input impedance of a GaAsFET at 144MHz is several thousand ohms. A suitable input matching network will have to have a loaded Q of greater than √(R1/R2). Let's assume a loaded Q of 15-20. In order to keep input losses to an absolute minimum, the unloaded Q of this network must be as high as possible. The individual components used in the network should have VHF Q values of many times the network loaded Q value. High quality air dielectric trimmer capacitors can have a Q of more than 1000. Small slug tuned inductors have typical Q values of only 50-100; better quality coils like the Toko S18 series have VHF Q of 150. Air cored coils wound from silver plated copper wire will have typical Q values of 400-600. Resonant transmission lines made from silver plated copper or brass in a metal cavity can achieve unloaded Q of several thousand. Such cavities are used in repeater duplexers where a combination of low loss and extreme selectivity is required.

Amateurs were building high Q, low loss matching networks long before GaAsFETs became available. The output matching networks of high power valve amplifiers must match the anode load impedance of several thousand ohms to a 50Ω load. VHF linear amplifiers often use large silver plated coils or transmission line networks made from copper or brass pipes or slabs. Such networks might seem a bit over the top for use in a receive preamplifier, but I know at least one amateur who uses copper water pipe for his preamp input matching networks.

Any of the matching networks that we have used in our previous projects could be used for the input matching network of our preamp. High pass (CLC) and low pass (LCL) T networks, pi networks and various

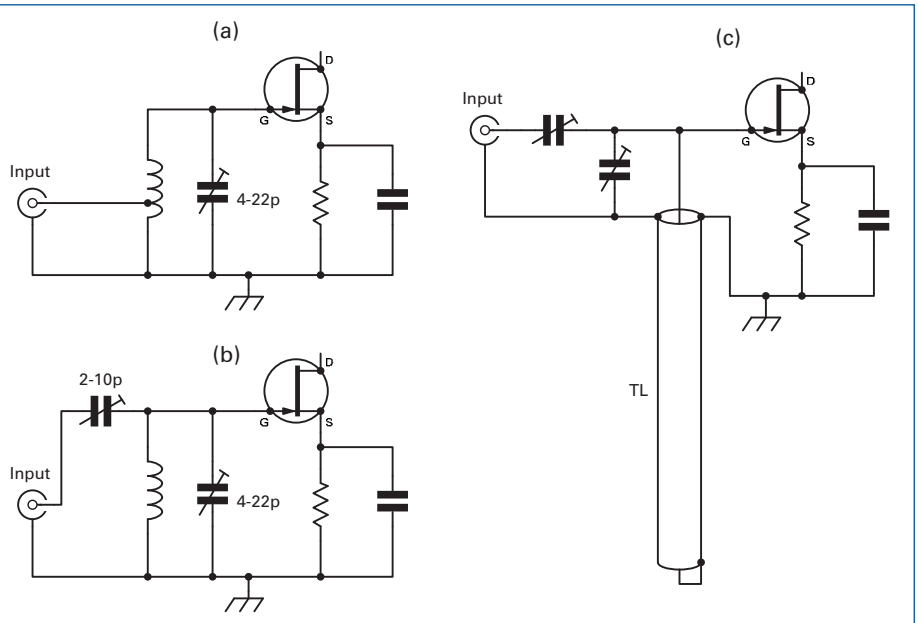


FIGURE 3: Some of the matching networks most commonly used in VHF preamps (see text).

capacitively and inductively coupled networks are all capable of doing the job. As well as providing the required impedance match, the selectivity of the input matching network will keep unwanted out-of-band signals from overloading the preamp input. **Figure 3** shows some of the matching networks most commonly used in VHF preamps.

The circuit at (a) requires only one high quality trimmer capacitor. This is the simplest practical input matching network for a GaAsFET preamp. Adjusting this network for best noise match is quite tricky because of the need to find the correct tapping point to connect the 50Ω feedline to the inductor. (b) is probably the most widely used input matching network. The second capacitor allows a quick and easy way of adjusting the coupling between the feedline and the FET gate circuit. Having two variable reactances allows much greater tuning flexibility. Imagine if your HF ATU only had one knob on the front! (c) shows how the LC parallel tuned circuit in the other networks can be replaced by a resonant length of transmission line. The line is a little shorter than a quarter wavelength and it is tuned to resonance using a trimmer capacitor. As with network (b), input coupling is via a variable capacitor. An alternative method of input coupling would be to use a tap near the shorted end of the transmission line. **Photo 1** shows a home made 23cm GaAsFET preamp with a quarter wave cavity input circuit.

Because microwave FETs have such high gain at 144MHz, the noise performance tends to be dominated by the input matching. Output matching is much less critical. Many designs just use a 100Ω resistor in the drain circuit and capacitive coupling from the drain to the output. A better method of output matching is to use a 4:1 transmission line transformer made from a few turns of wire, bifilar wound on a small ferrite toroid. This gives a drain load impedance of 200Ω and preamp gain of around 20dB.

PREAMP CONSTRUCTION. The RF amplifier will be described as a separate module so that it can be built and used as a preamplifier for an existing rig or as a masthead amplifier. The circuit was built on a strip of PCB laminate. The FET is self-biased by the voltage drop across the 82Ω source resistor. For best stability and maximum gain, it is important that both of the source leads of the FET are well decoupled to ground. **Photo 2** shows how the MGF1302 transistor is mounted on a pair of 4.7nF chip capacitors. The capacitors were mounted vertically on the board using a small tweezers and a pointed soldering iron.

The preamp uses tuned input and output circuits. To maintain good isolation between input and output, the input coil and the output coil(s) are mounted at 90° to minimise coupling. A screen made from double sided PCB laminate is soldered to the preamp ground-plane at a point close to the FET. A small notch was cut in the bottom edge of the screen for the 22Ω drain resistor. **Photo 3** shows the arrangement of the screen and the FET source resistor. The MGF1302 is vulnerable to static damage at this stage. Take care to avoid static build-up and don't leave the FET gate open-circuit for too long. Once the input coil is in place, there is no risk of static damage.

The RF amplifier schematic is shown in **Figure 4**. The input matching coil L1 is 8 turns of 1.5mm diameter silver plated copper wire wound on a 5mm former. Turn spacing is about 1mm. The capacitors in the input circuit are high quality air dielectric piston types. L2 is 6 turns of 1mm bare copper wire (TV co-ax core) wound on a 5mm former. The output tap is 1.3 turns from the power supply end. The 22pF trimmer capacitor is a standard green trimmer (Maplin WL70M

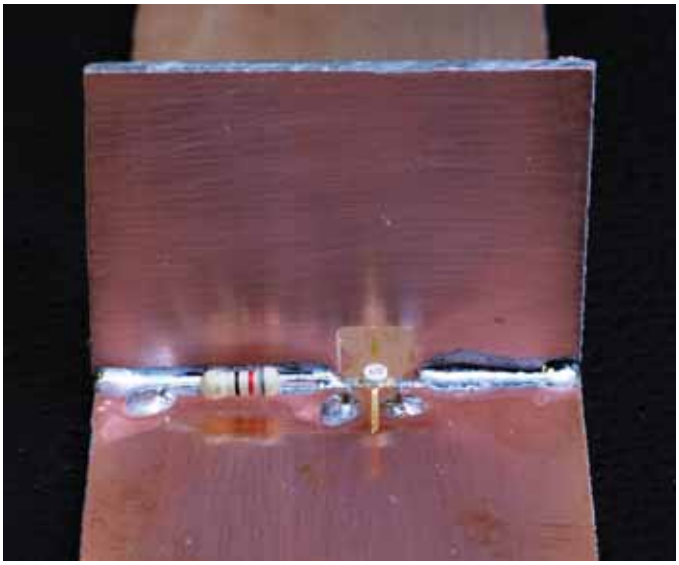


PHOTO 3: Arrangement of the screen and the FET source resistor.

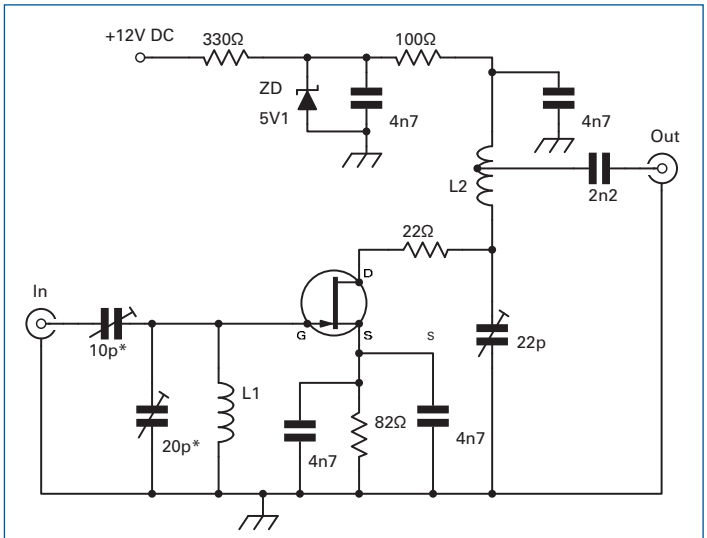


FIGURE 4: RF amplifier circuit diagram.

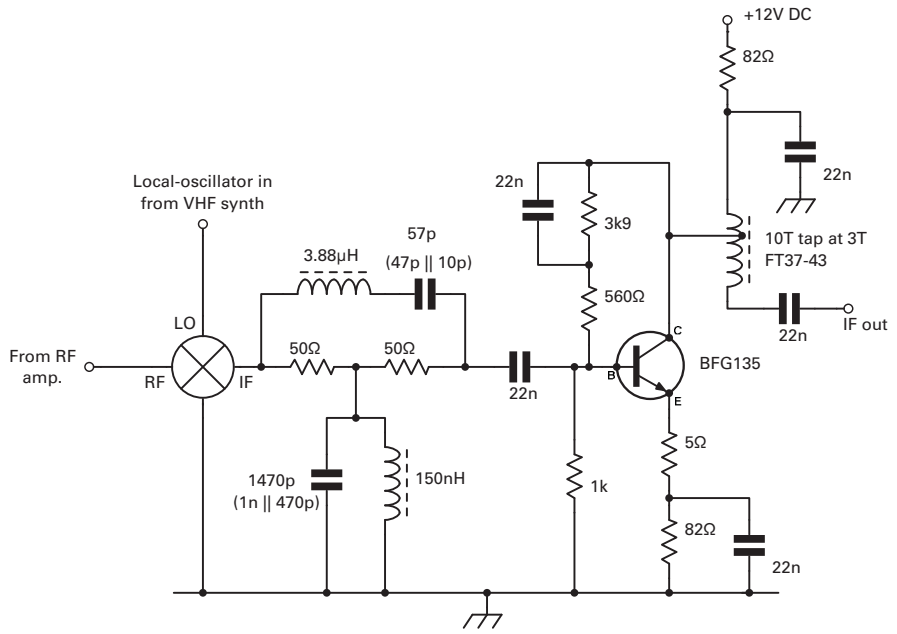


FIGURE 5: Circuit diagram of the mixer and post-mixer amplifier.

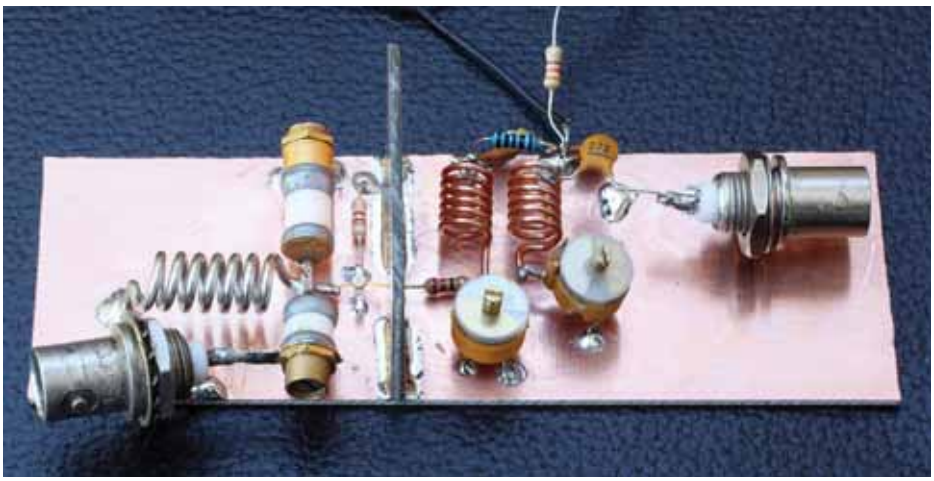


PHOTO 4: Finished RF amplifier.

or similar). The power supply voltage is regulated by a 5.1V 1.3W Zener diode.

AMPLIFIER TESTING. The amplifier gain and bandwidth was measured using a spectrum analyser and tracking generator. Just for fun, I set the input coupling capacitor at close to its minimum value and tuned the 20pF trimmer for a centre frequency of 144.5MHz. Gain was close to 40dB, but the amplifier was extremely unstable, even though the input and output were terminated by 50Ω. Increasing the input capacitor to mid range reduced the gain to a more reasonable level of 20-25dB. This adjustment also completely cured the instability problem. Next the amplifier was put in the feedline of my 2m transverter to see how it performed with off-air signals. A weak signal from GB3VHF at a distance of more than 600km provided a good opportunity to carefully tune the input matching for best signal to noise ratio rather than maximum gain. Don't be tempted to look at the S-meter during this adjustment. This amplifier has far more gain than you will ever need; best NF is what you are looking for. The output tuning is not critical; just adjust the 22pF trimmer for maximum signal.

After these adjustments, the amplifier gain was measured at 22-23dB. As this amplifier will be used in a receiver with a 10.7MHz IF, we will have to ensure that there is adequate rejection of the image signal at approximately 123MHz. Before the amplifier was connected to the mixer stage, I added a second tuned circuit to the output of the amplifier. **Photo 4** shows the finished RF amplifier. The extra coil can be seen at the right. One end is grounded, the other end is connected to a 22pF trimmer. The output tap is moved from its previous position on L2 to 1.3 turns from the grounded end of the new coil (lets call it L3). Please ignore the 65pF yellow trimmers. 22pF green types are more suitable for this application. The modified output network gives about 40-45dB rejection of the IF image. In theory, this is not adequate, but as I am using a horizontal beam resonant on 2m, the extra 20-30dB rejection of vertically polarised signals on the image frequency is enough to ensure that I never hear any out-of-band signals. It would be a good idea to include a 144MHz band pass filter between the RF amp and mixer stages if you live in an area where there are strong signals on the IF image, especially if you are using a vertical aerial.

Before we run out of space, I will give a brief description of the mixer and post-mixer amplifier. I used a pre-packaged SRA-2H diode DBM in the first prototype. The mixer is followed by a diplexer which was originally designed for Homebrew in January 2009. The schematic is shown in **Figure 5**. The 3.88μH inductor is 30 turns on a T50-6, the 150nH inductor is 5 turns on a T50-6. The post-mixer amplifier is a Philips BFG135 UHF transistor. The 50Ω output of this amplifier is matched to the 500Ω impedance of the IF filter using a transformer that has 10 turns of enamelled wire on a FT37-43 ferrite toroid. The 50Ω tap is at 3 turns from the power supply end of the wire.

Testing turned out to be a long and difficult affair. When the front-end circuits were wired up to the IF/AF back-end and synthesised local-oscillator, I found that my new receiver just didn't work. I could just about hear the signal from my shack signal generator, but the receiver was so deaf I couldn't hear any off-air signals. After much poking around and replacing the GaAsFET twice, I eventually discovered that the mixer was faulty. I haven't yet cracked it open to see what the problem was. When the mixer was replaced by a home made DBM, the receiver immediately sprang to life and distant beacons were easily audible. Comparing the receiver to my home made transverter showed that there is very little difference in sensitivity between the two receivers. This is hardly surprising because the current front-end of my transverter also uses an MGF1302 GaAsFET amplifier. Because of its stronger mixer and better first IF selectivity, the new receiver should have superior strong signal handling, but I haven't yet done any tests to confirm that this is the case. The home made DBM in the new front end is identical to the DBM used in the simple spectrum analyser described earlier: 4x 1N5711 Schottky diodes, 2 x 4 turn trifilar wound on FT37-61 toroids. Audio samples from the new receiver can be found at the links below.

CORRECTION: in the July Homebrew on p20, "2.5MHz reference and the 2.5MHz DDS output" should have read "1.25MHz reference and the 1.25MHz DDS output".

WEBSEARCH

[1] http://arvin.schnell-web.net/xanalyser/

Audio samples can be found at http://homepage.eircom.net/~ei9gq/GB3NGI.mp3 and http://homepage.eircom.net/~ei9gq/GB3VHF.mp3

RSGB shop

NEW

Homebrew Cookbook

By Eamon Skelton, EI9GQ

If you are interested in home construction, Eamon Skelton, EI9GQ is **the** acknowledged expert in this field. The *RadCom* columnist on the subject, Eamon brings his enthusiasm, common sense and easy to understand approach to the *Homebrew Cookbook*, such that readers will be reaching for their soldering iron with inspiration.

Homebrew Cookbook starts with the very basics of hombrew and progresses to advanced topics. There are construction methods that take you right through all the main techniques from dead-bug layouts through to dedicated printed circuit designs. The PCB section is packed with simple ideas that will allow you to make PCBs cheaply and easily without any specialist equipment. Eamon even shows you how to use sunshine or cheap halogen security lights as a UV source! Construction projects start with receiver designs and a simple direct conversion receiver, followed by a more sophisticated superhet receiver. *Homebrew Cookbook* also includes an SSB transmitter, PA and a VHF transverter. All the designs are modular, making it very easy to extract sections for other uses and adapt the designs to suit your needs. Where test equipment is required Eamon has simple circuits on hand to allow you to build your own rather than have to buy commercial equipment. Eamon also deals with homebrew antennas with lots of useful tips for making practical and effective antennas with junk-box components. Through the book is an adherence to homebrew principles as all projects use simple construction techniques with cheap, readily obtainable, components. Eamon even tells you how to make the most of eBay to find what you need.

The *Homebrew Cookbook* is an edited, updated book of Eamon's writings from the pages of *RadCom* and a fantastic reference with simple, well-proven solutions to most construction problems. *Homebrew Cookbook* will have you itching to dust off the soldering iron and start construction.

Size 174x240mm, 208 pages, ISBN 9781-9050-8657-3

Non Members' Price £12.99

RSGB Members' Price £11.04

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

ICOM

What You've All Been Waiting For!

If you have been wanting to become involved with D-Star radio, ICOM has developed the new IC-E80D and ID-E880 just for you. Both radios have an improved user interface and a smart new look. With these two new versatile transceivers, you just can't go wrong, whether operating on or off road!

LCD not shown with accurate colour

New! IC-E80D VHF/UHF Dualband Handheld

- Digital D-Star and Analogue Capabilities
- Improved User Interface
- Wideband Receiver
- Li-Ion Power
- Free Programmable Software*
- Optional GPS Speaker Mic
- External DC Power Jack

New! ID-E880 VHF/UHF Dualband Mobile

- Digital D-Star and Analogue Capabilities
- Improved User Interface
- Wideband Receiver
- 1052 Alphanumeric Memory Channels
- Large LCD Display
- Detachable Controller
- Free Programmable Software*

(*Free programming software for both radios is easily downloadable from: www.icom.co.jp)

Join the Worldwide D-Star Community!

(D-STAR - Stands for Digital Smart Technology for Amateur Radio)

If you want to be D-STAR STRUCK... just check out our dedicated D-STAR website on: www.d-staruk.co.uk

2-Year Warranty

DIGITAL

Icom UK Ltd.
Blacksole House, The Boulevard, Altira Park, Herne Bay, Kent CT6 6GZ. UK.
Tel: +44 (0)1227 741741. Fax: +44 (0)1227 741742. e-mail: info@icomuk.co.uk www.icomuk.co.uk

HAM WEEK UK 1-10 October 2010

Previewing What's On

National Hamfest

FRIDAY 1 AND SATURDAY 2 OCTOBER 2010, 10AM TO 4PM

George Stephenson Pavilion, Newark & Nottingham Showground, Lincoln Road, Winthorpe, Newark NG24 2NY

ENCOURAGING YOUTH. A number of schools in the Newark and Lincoln areas are being invited to attend this year's National Hamfest. The Radio Communication Foundation's mobile teaching centre, GB4FUN, will be taking an active part during the show.

National Hamfest manager, Clive Catton, G1BSN, is keen that young people can have an introduction to amateur radio and through it perhaps a career in communications based science. Clive's 13 year old son, Jeremy, holds the callsign M6JSC. Jeremy is one of two 13 year olds in the Lincoln club. They feel that their interest in the hobby goes hand in hand with science lessons in school. Local teachers have seen the potential of the hobby in other subjects too – maths, IT, languages and geography can also benefit.

TRANSPORT. Arrangements are being made with a local taxi firm to have cars available to take visitors to and from the local stations. Newark Northgate station has high speed rail links to London, Newcastle, Edinburgh and West Yorkshire. Newark Castle station has services to Nottingham and Birmingham to the west and to Lincoln, Grimsby, Sleaford, Skegness and Peterborough to the east. The stations are less than 2 miles away.

TRADERS. Twenty eight traders have already signed up to attend the National Hamfest. It's one of the few times you will be able to meet the three main manufacturers in the UK – Icom, Kenwood and Yaesu – and all three have new radios due in the market place soon. Amongst the traders you will be able to find everything from plugs and sockets to cable and linears to antennas.

CAMPING. Some visitors to the show may want to make a weekend of the event. Caravan pitches and camping spaces are available through the organisers. Toilet and shower facilities to a good standard are situated in the camping area but unfortunately there is no power hook up available on site. A new gate will allow campers direct access to the show. Camping pitches can be booked on the website www.nationalhamfest.org.uk.

DETAILS. The show's website, www.nationalhamfest.org.uk has all the details of the dealers and attractions, directions and other useful links. Advance ticket sales are available on the website with great discounts for advance group purchases. It's an economical way to arrange a club outing to the show.

The Bilal Isotrons for 40m/80m

Small antennas for the HF bands

The 80m Isotron antenna.

SPACE SAVER. I had been looking forward to testing the Bilal Isotron HF antenna. I have read about these for some time and given that they have been around for 30 years it was about time that we tested one. Now that Martin Lynch is importing them from the Colorado company it seemed like a good opportunity.

If you are not familiar with the Isotron range, they are small antennas for the 160m-6m bands. When I say small, I *mean* small. The 80m version as tested was only 32 x 16 x 15in (81 x 41 x 38cm) in size. The 40m version was even smaller – 22 x 16 x 15in (56 x 41 x 38cm).

Many people struggle to put out a signal on 80m from a small (or no) garden. With a dipole 132ft long (and even a G5RV 102ft long) it is no surprise that many people just can't get on the band. While a long wire will work, you still need at least 66ft, preferably more.

So an antenna that is less than three feet tall is obviously attractive. But can it possibly work? According to most Isotron users the answer is yes. Look at eham.net and you'll see that the antenna currently scores 4/5. Buyers seem to either love them or hate them – with little in between. While researching my upcoming book on stealth antennas I came across one flat-bound American amateur who uses nothing else but Isotrons. He has them mounted on a pole in his spare room and yes, he makes contacts.

Anyway, back to the test. The antennas supplied were the 40m and 80 Isotrons. You can set these up independently or mount them together on a single mast, fed by one length of coax. The interconnection between the two antennas is by a short length of supplied 300Ω slotted feeder.

There is nothing magical about the design. They use two aluminium capacitor plates top and bottom with a coil mounted between them. This LC combination makes the antenna resonant on a given frequency. There has been discussion on Antennex.com as to whether the coax is actually part of the radiating system. The instructions state that you should avoid lengths of coax that are an exact ¼ wavelength and I think that the coax is involved.

The manual says that the antennas must be mounted on a metal pole, preferably earthed. It can be mounted in an attic or on a balcony, but even if you can't earth the antenna it should still be on a metal pole. The instructions say that if you mount them in the attic you could use the mains earth for your connection, but this seems like a recipe for RFI unless you are running QRP.

The antennas arrived in a very small cardboard box. Opening it revealed the two coils (one for the 80m version and one for the 40m). Also included were the aluminium top and bottom plates, the plastic/nylon insulators that hold the plates apart, plus all the hardware to assembly the antenna. The instructions came as a photocopied booklet, but were quite clear. It took about 30-45 minutes to assemble each antenna. I suggest you read the instructions very carefully and allow some time for mistakes. It wasn't until I went to connect up the coil that I realised that I had put the insulating spacers in upside down. You won't need much in the way of tools – I used a couple of 11mm spanners and a flat-head screwdriver.

The antenna uses two aluminium rods to suspend the resonating coil between the top and bottom capacitor plates. The 80m version also has two small square aluminium tuning plates on rods that can be moved to tune the antenna to the part of the band you are interested in. You are advised not to fit these until the antenna is in position and you have found the natural resonant point, but given that it is designed to operate out of the box at around 3.950MHz (The US 75m band) you may as well fit one or both tuning rods from the start.

Bilal recommends one tuning rod and hat if you wish to operate from 3.675 – 3.8MHz and two if you wish to operate from 3.5 – 3.675MHz.

Once assembled the antenna is quite light (6lbs/2.7kg) and can easily be picked up with one hand. My only complaint was that the edges of the aluminium plates were a little sharp and it might pay to use some emery cloth on these to save cutting yourself.

Once assembled I mounted it on a lightweight 18ft aluminium mast that has been living in my shed since I moved into this property three years ago. This was mounted temporarily in a ground post in the back garden and the antenna was fed with Mini 8 coax.

Without the two tuning rods the antenna resonated at around 4.0MHz – way too high. But putting both tuning rods on, with the small aluminium capacity hats facing down,

the SWR came down to 1:1.8 at 3.610MHz, using an earthed MFJ analyser. The 3:1 SWR bandwidth at this setting was 3.586 – 3.642MHz (56kHz).

It is obviously best to set the antenna in the region of the band that is of most interest to you.

Conditions on a May afternoon on 80m were not too good, but there were one or two SSB signals around. I compared the Isotron with my 132ft OCFD, which actually lays across the roof at about 30ft. I also have an 85ft W3EDP end fed that also goes over the same roof. Both antennas perform about the same on 80m. I live in a typical suburban location and the noise level on 80m is usually S8-S9 all the time.

I found the noise level on the Isotron about 3 S-points lower than on my normal antennas as it was positioned further away from the house. This made listening much easier. In terms of signal strength, signals were generally down about 1-2 S-points on the Isotron.

With the antenna tuned to 3.600MHz my rig's internal ATU was able to find a match at 3.500MHz and 3.700MHz, but couldn't find a match at 3.800MHz. So if you want to try and work the whole band make sure you set the resonant point at about 3.650, and you may need to use an external ATU. Obviously, it is better all round to set the resonant point in the region of the band of most interest to you – SSB, PSK or CW. The fall off as you moved away from the resonant point was quite obvious. While at its resonant point the antenna was at times equal to my other antennas.

A CW QSO with Ray, G3ASG showed that the antenna was OK until QSB kicked in, then it became a bit of a struggle. Switching to the W3EDP made life a lot easier. That evening it was the same story. Contacts with F5VLO, G6NKL, M0KVA and G6UUR showed similar results to the afternoon.

This isn't quite as bad as it sounds as most signals in the evening on 80m are often 59+ 10-20dB, so they become S8-S9 on the Isotron. However, if conditions are marginal the Isotron will lose out. It performed better on CW and PSK31 where absolute signal strength is not as critical.

I passed the antenna to Roger, G3LDI who mounted it at 45ft and compared it with a low-ish 80m dipole at about 25ft. Roger found similar results to me – signal strengths were 10-20dB down with the Isotron and he found it noisier. He worked DO1DTA on 3635 getting a 59 report. Roger then switched to the dipole and received 5-9 plus 20dB.

Later he called CQ on the Isotron. G3OKA gave him 59, coming back to his first call too. Roger then switched to the dipole and he gave him 59 plus 10dB.

If you are looking for a replacement for an 80m dipole you will be disappointed, but if you have no other way of getting on the band it will work well for you, just make sure that you operate as close to its resonant point as possible for the best results.

The 40m Isotron antenna.

40m VERSION. I then built the 40m version, which looks very similar, but is slightly shorter. The aluminium capacitor plates are also less wide than on the 80m version and it only has one tuning rod, not two.

I fitted the tuning rod, complete with the small 1.5 inch square aluminium capacity hat and set it in the minimum capacitance position. I put the Isotron on the 18ft mast and found that it resonated out of the box at 7.050MHz with an SWR of 1:1.4. It also showed that it should be possible, by adjusting the tuning arm to resonate the antenna in the CW portion of the band.

I then took the tuning arm off completely and found that the antenna resonated at 7.3MHz, so it looks like you do need the tuning arm on, at least for the UK allocation on 40m.

Tuning arm back on, but with no capacity hat, and I eventually managed to get the antenna resonant at 7.1MHz with an SWR of 1:1. The SWR at 7.000 and 7.200MHz was then 1:2.5.

At the CW end of 40m the antenna was quite lively. Signals that were S9+10dB on the 132ft OCFD/W3EDP long wire were S8 on the Isotron, but then the centre of the dipole is 12ft higher. Some signals were only 1-2 S-points less on the Isotron, and quite a few were identical.

In the SSB portion of the band, my first call was answered straight away by DL60DRC, a special event station in Germany. Other SSB signals were also either equal on the Isotron or down by no more than 1-2 S points.

How the Isotron looks when you unpack the box.

Close up of the tuning rod.

The 40m Isotron didn't strike me as too much of a compromise. If you have no room for a 40m dipole the antenna will get you on the band. Again, if your interests are CW or PSK31 the antenna will serve you well. If you prefer SSB your signals are likely to be down by 1-2 S-points, but you will work the stronger stations.

CONCLUSION. The lightweight 40m and 80m Isotrons allow you to get on the bands when you don't have room for a full-size dipole or long wire. Yes, signal strengths are likely to be down a little, but you will be able to operate. It pays to get the antennas as high as possible (a chimney would be ideal if you don't have a mast) and follow the installation instructions carefully to get the best results.

Are they pile-up breaking DX antennas? No. But that's missing the point. With many people living in houses with little or no gardens the Isotrons allow you to continue to enjoy the hobby. Isn't that what it is all about?

My thanks to ML&S for the loan of the review models.

Previewing What's On

RSGB Convention

Friday 8 October to Sunday 10 October 2010

Horwood House near Milton Keynes is the new venue for the ever-growing RSGB Convention.

APPROACHING FAST. By the time you r ead this, the RSGB Convention will only be some 10 weeks away. The programme is being finalised, the talks are being prepared and the organisers are arranging the social activities for the Friday and Saturday evening. The event is being sponsored by Icom UK and Martin Lynch & Sons, who will be at the event with a selection of radios and other equipment. ML&S are celebrating their 20th anniversary year and the Friday evening buffet will be celebrating that fact.

Tickets are available for one or two nights at Horwood House including the Friday evening MLS Birthday Buffet and the Saturday DX Dinner if required. Day tickets are also available for the Saturday or Sunday. Check out the website www.rsgbevents.org for details of the tickets and pricing available. There is a discount for those one or two night packages if booked before 14 August.

Visitors to the RSGB Convention will have the opportunity to win an Icom IC-7000 HF/50MHz/VHF/UHF mobile transceiver, kindly donated by Icom UK and a Yaesu FT-450, kindly donated by ML&S and Yaesu UK.

TALKS. There are four streams each day to choose between: IOTA/DX Operating, VHF & Up, Technical and Contest University on Saturday and, on Sunday, Something New takes over from Contest University. We've already brought you details in last month's *RadCom* on the talks by Ian White, Jim Bacon and Dr Lucie Green and the varying topics of Coronal Mass Ejections from the Sun, Sporadic-E experiments and Ferrite chokes for baluns and EMC.

IOTA/DX OPERATING. IOTA/DX Operating stream welcomes Roy Lewallen, W7EL, who is world-renowned for his antenna modelling software *EZNec*. At the RSGB Convention, his talk is entitled Antenna Not-So-Basics – How To Get More From Less. He will be looking at largely overlooked or misunderstood principles of how antennas really work. Roy will tell how to make a back yard dipole with over 4.4dBd gain, tell how to get 6 S-units of gain from an ordinary three-element beam and describe a compact portable antenna with less than 2:1 SWR on all HF bands – and much more.

The TX3A DXpedition to Chesterfield Islands in November 2009 was an outstanding example of what a two-man expedition can do on LF from the Pacific, with proper planning and a lot of commitment. Tomi, HA7RY, one of two members of the team, and Chris, HA5X, webmaster to the team, will talk about what it took to make this all happen.

Another very interesting talk in the IOTA/DX Operating Stream is Line Islands (T32) by Derek Cox, G3KHZ. In March 2010, a small team of IOTA devotees activated several uninhabited island in the Line Island (Eastern Kiribati) group, involving many days in a small boat travelling South from Kiritimati. Derek, G3KHZ will give a PowerPoint and video presentation of the exciting 2000 nautical mile sea journey to four new IOTA locations. It is probably the only DXpedition in recent times to notch up four new IOTA entities in a single trip. These islands are all uninhabited but, as you will see, they found plenty of evidence of past human activity.

SOMETHING NEW. Brian Reay, G8OSN is aiming his talk at those new to HF, be they total newcomers or older amateurs who have stayed on VHF. He's planning cover the basics of venturing into DX operating and the use of propagation tools and beacon network.

TECHNICAL. Peter Chadwick, G3RZP is always a popular lecturer at the RSGB Convention. This year his talk is on linear amplifiers as they are an integral part of any SSB transmitter at any power, although the term is usually applied to an external power amplifier. In this lecture, he's going to look at the basics of what is meant by linearity, how it is measured and how linear amplifiers work. Additionally, the way in which the requirements contained the international radio regulations on spurious emissions affects the design will be examined. The advantages and disadvantages of the solid state versus valved amplifiers at high power will be described, the basic design techniques and the construction techniques involved in building amplifiers illustrated. And he'll identify some of the pitfalls that can trap the unwary!

Amateurs may be familiar with Leaflet EMC12 that explained the impact of part P of the Building Regulations that came into force in 2005. Since then a new edition of the IEE Wiring Regulations BS 7671:2008 has been published. Although not retrospective it does contain useful guidance on Additional Protection. As part of the Technical Stream, Rupert Thorogood will describe the changes that have taken place, the impact on the radio amateur and the shortcomings of RCD protection. He will demonstrate the full range of tests that are to be carried out on RCDs and there will be a handout on how to approach nuisance tripping.

Ian Wade, G3NRW, is giving two presentations on the AIM4170 antenna analyser at the RSGB Convention. The first will cover the basics of antenna measurement and the second will illustrate the use of the 4170 as a design tool. The analyser was reviewed by Chris Lorek, G4HCL, in the July 2007 *RadCom*.

Live demonstrations of the AIM4170 will be the main feature of the presentations and will include tuning a 4m ground plane, trap tuning, designing a 160/80m trap dipole, measuring quartz crystal parameters, using

UK Ham Week 2010 - What are you doing?

Back in March RadCom the RSGB asked its membership to organise a series of events and activities up and down the country in Ham Week. The idea is that amateurs can participate in and have some fun whilst the RSGB will promote the activities provide support materials etc. The member's role was to supply the ideas and the manpower and we will try to get the participation of as many as possible including the general public.

We now need to know what you are planning to do?

Don't forget there is plenty you can do. Ideas we have had include opening up your shack to visitors or perhaps some special club activity to attract new foundation candidates. Perhaps this is a good week for a SOTA challenge or perhaps a special effort on the 144MHz club championship Tuesday (5th) or the 21/28MHz contest on Sunday (3rd).

So let us know your plans today by e-mail to hamweek@rsgb.org.uk.

the Smith chart, quarter-wave stub tuning and measuring the impedance at the antenna feedpoint. The final demonstration will show how to control the analyser remotely via a Wi-Fi link, allowing you to tune your antenna while standing in the garden (or on the roof or at the top of the tower). The presentations will be based on the material at http://homepage.ntlworld.com/wadei/aim4170.htm.

VHF & UP. David Johnson, G4DPZ has been involved with Orbital Satellites Carrying Amateur Radio (OSCAR) for more than 37 years. As a user, software engineer, AMSAT-NA (Life member), AMSAT-UK Committee member and magazine editor. He will be presenting a talk on amateur satellites including

- the history, which started as far back as December 1961 – just 4 years after Sputnik 1
- techniques, in terms of equipment, modes and protocols
- operational satellites, both communication and experimental CubeSats
- satellites under development and their characteristics
- a status report on the progress of the development of the RFC legacy funded FUNcube educational outreach satellite.

EXAMS. At the RSGB Convention you can sit any or all of the UK amateur radio exams. If you wish to take the Foundation and or the Intermediate level exam, you will need to book 10 working days in advance of Convention to guarantee a place. For the Advanced level please book 15 working days in advance. All exams must be booked through the Examinations Department of the RSGB by e-mail to rce.dept@rsgb.org.uk or by calling the RSGB on 01234 832700, choosing option 4 on the automated switchboard. Candidates for the Foundation & Intermediate exam must contact Brian Reay, G8OSN by e-mail to ardc.chairman@rsgb.org.uk and inform him of their progress on practical assessment because the practical assessment must be completed before the Convention.
If required, Brian can advise on finding a local tutor to complete practical assessments in advance of examinations. It will also be possible to sit the US amateur exams at the Convention. More details on this will be on the website, www.rsgb.org/rsgbconvention when they become available.

MOONRAKER

Manufacturers of radio communication antennas and associated products

SALES LINE 01908 281705

E-mail: sales@moonraker.eu

Web: www.moonraker.eu

ALINCO

Hand-helds

Alinco DJ-G7 Great triband 2/70/23cm **£299.95**

Alinco DJ-596 Robust dual band 2/70cm **£169.95**

Alinco DJ-C7E Slim line dual band 2/70cm **£149.95**

Alinco DJ-V17 Robust single band 2m **£129.95**

Alinco DJ-195E Popular single band 2m **£129.95**

Alinco DJ175E Great value single band 2m **£99.95**

Mobiles

Alinco DR-635E Next generation dual band 2/70cm **£299.95**

Alinco DR-435E Mk3 Latest version single band 70cm **£229.95**

Alinco DR-135E High power single band 2m **£199.95**

Alinco DR-435FXE High power single band 70cm **£179.00**

Base/Portable

Alinco DX-SR8 100W 1.8-50MHz All mode base station **£549.95**

KENWOOD

Hand-helds

Kenwood TH-F7E Dual band 2/70cm RX 0.1-1300MHz **£229.95**

Kenwood TH-K2ET Single band 2m with 16 button keypad **£165.95**

Kenwood TH-K2E Single band 2m **£159.95**

Kenwood TH-K4E Single band 70cm **£159.95**

Mobiles

Kenwood TM-D710E Dual band 2/70cm with APRS RX 118-524MHz & 800-1300MHz, 50 Watts **£429.95**

Kenwood TM-V71E Dual band 2/70cm with EchoLink RX 118-524MHz & 800-1300MHz, 50 Watts **£289.95**

Kenwood TM-271E Single band 2m, 60 Watts **£165.95**

Base

Kenwood TS-2000X All mode transceiver HF/50/144/430/1200MHz 100 Watts All mode transceiver **£1,749.95**

Kenwood TS-2000E All mode transceiver HF/50/144/430MHz 100 Watts All mode transceiver **£1,489.95**

Kenwood TS-480HX HF/6m 200 Watts Transceiver **£849.95**

Kenwood TS-480SAT HF/6m 100 Watts Transceiver **£749.95**

YAESU

Hand-helds

NEW Yaesu VX-8DE Triband same spec as VX-8E but with enhanced APRS **£399.95**

Yaesu VX-8E Tri band 50/144/430MHz Bluetooth ready, 5 Watts output **£299.95**

Yaesu VX-7R Tri band 50/144/430MHz RX 0.5- 900MHz, 5 Watts outut **£259.95**

Yaesu VX-6E Dual band 2/70cm RX 1.8-222/420-998MHz, 5 Watts output **£199.95**

Yaesu FT-60E Dual band 2/70cm RX 108-520/700-999.99MHz, 5 Watts output **£142.95**

Yaesu VX-3E Dual band 2/70cm RX 0.5-999MHz, 3 Watts output **£139.95**

Yaesu VX-170E Single band 2m, 16 digit keypad, 5 Watts output **£95.95**

Yaesu FT-270E Single band 2m, 144-146MHz, 137-174MHz Rx **£99.95**

Mobiles

Yaesu FT-857D All mode HF/VHF/UHF 1.8-430MHz, 100 Watts output **£574.95**

Yaesu FT-8900R Quad band 10/6/2/70cm 28-430MHz, 50 Watts output **£334.95**

Yaesu FT-8800E Dual band 2/70cm RX 10-999MHz, 50 Watts output **£289.95**

Yaesu FTM-10E Dual band 2/70cm, 50 Watts output **£269.95**

Yaesu FT-7900E Dual band 2/70cm 50/40 Watts with wideband RX **£229.95**

Yaesu FT-2900E Single band 2m 75 Watt heavy duty transceiver **£139.95**

Yaesu FT-1900E Single band 2m 55 Watt high performance transceiver **£129.95**

Portable

Yaesu FT-897D HF/VHF/UHF Base/Portable transceiver 1.8-430MHz 100 Watts HF+6, 50 Watts 2M, 20 Watts 70cm **£659.95**

Yaesu FT-817ND HF/VHF/UHF Backpack Transceiver RX 100kHz – 56MHz 76-154MHz 420-470MHz 5 Watts **£439.95**

Base

Yaesu FT-2000D HF/6m All mode 200 Watts transceiver RX: 30kHz – 60MHz **£2,649.95**

Yaesu FT-2000 HF/6m All mode 100 Watts transceiver RX: 30kHz – 60MHz **£2,079.95**

Yaesu FT-950 HF/6m 100 watt transceiver with DSP & ATU RX 30kHz – 56MHz **£1,099.95**

Yaesu FT-450AT Compact transceiver with IF DSP and built in ATU, HF+6m 1.8-54MHz, 100 Watts output **£679.95**

Yaesu FT-450 Compact transceiver with IF DSP, HF+6m 1.8-54MHz, 100 Watts output **£589.95**

ICOM

Hand-helds

ICOM IC-E80D D-Star dual band 2/70cm handheld with wideband RX 0.495-999.99MHz **£369.95**

ICOM IC-E92D Dual band 2/70cm RX 0.495-999.9MHz with built in DSTAR **£369.95**

ICOM IC-E90 Tri band 6/2/70cm RX 0.495-999.9MHz **£234.95**

ICOM IC-U82 Single band 70cm digital with 5 Watts output. **£172.95**

Mobiles

ICOM IC-7000 All mode HF/VHF/UHF 1.8-50MHz, 100 Watts output **£1,089.95**

ICOM IC-706MkIIGDSP HF/VHF/UHF 1.8-70cm, 100 Watts output **£799.95**

ICOM ID-1 Single band 23cm 1240-1300MHz digital and analogue DSTAR transceiver **£699.95**

ICOM IC-E2820 + UT123 Dual band 2/70cm with DSTAR fitted, 50 Watts output. **£579.95**

ICOM IC-E2820 Dual band 2/70cm DSTAR compatable, 50 Watts output **£424.95**

New ID-E880 D-Star ready dual band with wide band RX 0.495-999.99MHz **£429.95**

Base

ICOM IC-7800 HF/6m All mode 200 Watts Icom flagship radio **£7,999.95**

ICOM IC-7700 HF/6m 200 Watts with auto ATU transceiver **£5,499.95**

ICOM IC-7600 HF/6m 100 Watts successor to the IC-756 ..... **£3,379.95**

ICOM IC-7400 HF/6/2m 100 Watts with auto ATU transceiver **£1,339.95**

ICOM IC-7200 HF/VHF 1.8-50MHz RX 0.030-60MHz, 100 Watts output (40w AM) **£799.95**

ICOM IC-718 HF 1.8-30MHz RX 300kHz - 29.999MHz, 100 Watt output (40w AM) **£519.95**

eton

Eton Globe Traveller G3 AM/FM/Shortwave Digital Radio with SSB, RDS and Synchronous detector RX:150-30000kHz 118-137 MHz **£99.95**

Satellit 750 AM/FM-Stereo/SW/Aircraft band Radio with SSB RX: 100-30000kHz 88-108MHz 118-137MHz **£299.00**

AirNav Systems

The Most Trusted Name in Flight Tracking

"New" AirNav RadarBox 3D

£479.95 + £7.99 P&P

● Watch all the action from home ● Real-Time radar Mode-S and ADS-B decoder ● Zoom worldwide to runway level ● Network your station with others ● Self powered from your computer or laptop USB port ● Centre map on your home – Direct reception

This new 3D version of the ever popular AirNav Radar Box adds Google Earth as a map overlay. In addition, the new 3D picture library displays the selected aircraft, enables you to zoom down and see the airport runway, or zoom out and see the aircraft fly over towns, sea and mountains. Never before has such detail and excitement been available.

AirNav RadarBox-Pro. £389.95 The original box with everything you need including RadarBox, antenna and easy to install software.

"NEW" AirNav RadarBox 3D Upgrade.£89.95 Upgrade your existing RadarBox 2009 to 3D version with this plug and play software.

Radar Box Accessories Available: Base Antennas, Amplifiers & Cable leads

SPECIAL DEAL Free Radar Rama Antenna when purchasing either Radarbox worth £49.95

SBS-1er Pocket Radar

The pocket radar allows you to track ADS-B aircraft on a PC simulated radar screen and identifies and displays Mode-S equipped aircraft. Order now from us and get a free Radar-Rama external antenna worth £49.95. **SBS-1er + Radar Rama** antenna. RRP **£549.90** Intro offer **£469.95**

FlexRadio Systems

Software Defined Radios

FLEX-1500 software defined radio **£549.95**
TX 160-6m, RX 10kHz – 60MHz, SSB CW FM AM, 0.5-5 Watts PEP

FLEX-3000 ..... **£1399.95**
TX 160-6m, RX 10kHz – 60MHz, CW AM LSB USB FM RTTY, 1-100 Watts PEP

FLEX-5000A **£2495.95**
TX 160-6m, RX 0.01 – 65MHz, SSB CW AM FM FSK AFSK, 1-100 Watts PEP full featured radio with more flexibility than virtually any other transceiver on the market

FLEX-5000A-ATU same as above but with built in ATU **£2795.95**

Check on-line for all updates, new products and special offers

MOONRAKER

SALES LINE 01908 281705

E-mail: sales@moonraker.eu
Web: www.moonraker.eu

If we advertise it – we stock it!

MFJ Antenna Tuners

New lower prices!

See our website for full details.

AUTOMATIC TUNERS

MFJ-925 Super compact 1.8-30MHz 200W **£169.95**
MFJ-926 remote Mobile ATU 1.6-30MHz 200W **£419.95**
MFJ-927 Compact with Power Injector 1.8-30MHz 200W **£249.95**
MFJ-928 Compact with Power Injector 1.8-30MHz 200W **£199.95**
MFJ-929 Compact with Random Wire Option 1.8-30MHz 200W **£209.95**
MFJ-991B 1.8-30MHz 150W SSB/100W CW ATU **£209.95**
MFJ-993B 1.8-30MHz 300W SSB/150W CW ATU **£249.95**
MFJ-994B 1.8-30MHz 600W SSB/300W CW ATU **£339.95**
MFJ-998 1.8-30MHz 1.5kW **£649.95**

MANUAL TUNERS

MFJ-16010 1.8-30MHz 20W random wire tuner **£69.95**
MFJ-902 3.5-30MHz 150W mini travel tuner **£99.95**
MFJ-902H 3.5-30MHz 150W mini travel tuner with 4:1 balun **£124.95**
MFJ-904 3.5-30MHz 150W mini travel tuner with SWR/PWR **£129.95**
MFJ-904H 3.5-30MHz 150W mini travel tuner with SWR/PWR 4:1 balun **£149.95**
MFJ-901B 1.8-30MHz 200W Versa tuner **£109.95**
MFJ-971 1.8-30MHz 300W portable tuner **£119.95**
MFJ-945E 1.8-54MHz 300W tuner with meter **£129.95**
MFJ-941E 1.8-30MHz 300W Versa tuner 2 ..... **£139.95**
MFJ-948 1.8-30MHz 300W deluxe Versa tuner **£159.95**
MFJ-949E 1.8-30MHz 300W deluxe Versa tuner with DL **£179.95**
MFJ-934 1.8-30MHz 300W tuner complete with artificial GND **£199.95**
MFJ-974B 3.6-54MHz 300W tuner with X-needle SWR/WATT **£189.95**
MFJ-969 1.8-54MHz 300W all band tuner **£209.95**
MFJ-962D 1.8-30MHz 1500W high power tuner **£289.95**
MFJ-986 1.8-30MHz 300W high power differential tuner **£349.95**
MFJ-989D 1.8-30MHz 1500W high power roller tuner **£389.95**
MFJ-976 1.8-30MHz 1500W balanced line tuner with X-needle SWR/WATT **£469.95**

MFJ Analysers

MFJ-229 UHF Digital Analyser 270-480MHz **£199.95**
MFJ-249B Digital Analyser 1.8-170MHz..... **£259.95**
MFJ-259B Digital Analyser 1.8-170MHz..... **£259.95**
MFJ-269 Digital Analyser 1.8-450MHz..... **£349.95**
MFJ-269PRO Digital Analyser 1.8-170/415-450MHz..... **£379.95**

LDG ELECTRONICS Tuners

LDG Z-817 1.8-54MHz ideal for the Yaesu FT-817 ..... **£122.95**
LDG Z-100 Plus 1.8-54MHz the most popular LDG tuner **£143.95**
LDG IT-100 1.8-54MHz ideal for IC-7000 ..... **£159.95**
LDG Z-11 Pro 1.8-54MHz great portable tuner **£159.95**
LDG KT-100 1.8-54MHz ideal for most Kenwood radios **£174.95**
LDG AT-897Plus 1.8-54MHz for use with Yaesu FT-897 ..... **£183.95**
LDG AT-100 Pro 1.8-54MHz **£194.95**
LDG AT-200 Pro 1.8-54MHz **£214.95**
LDG AT-1000 Pro 1.8-54MHz continuously **£509.95**

AVAIR SWR Meters

AV-20 (3.5-150MHz) (Power to 300W) **£34.95**
AV-40 (144-470MHz) (Power to 150W) **£34.95**
AV-201 (1.8-160MHz) (Power to 1000W) **£49.95**
AV-400 (14-525MHz) (Power to 400W) **£49.95**
AV-601 (1.8-160/140-525MHz) (Power to 1000W) **£69.95**
AV-1000 (1.8-160/430-450/800-930/1240-1300MHz) (Power to 400W) **£79.95**

WATSON Power Supplies

POWER-MITE-NF (22amp switch mode with noise offset) **£69.95**
POWER-MAX-25-NF (22amp switch mode with noise offset & cig socket) **£89.95**
POWER-MAX-45-NF (38amp switch mode with noise offset & cig socket) **£119.95**
POWER-MAX-65-NF 60 Amp cont 65 Amp peak switch mode variable volts supply with V & A meters & noise offset **£209.95**

MASTRANT High Performance Guy Rope

MASTRANT P3 3mm 200Kg **£0.30ppm**
MASTRANT P3 Drum 100m 3mm 200Kg **£22.95**
MASTRANT P4 4mm 400Kg **£0.40ppm**
MASTRANT P4 Drum 100m 4mm 400Kg **£32.95**
MASTRANT P6 6mm 850Kg **£1.00ppm**
MASTRANT P6 Drum 100m 6mm 850Kg **£79.95**
MASTRANT D2 2mm 200Kg **£0.40ppm**
MASTRANT D2 Drum 100m 2mm 200Kg **£33.95**
MASTRANT D3 3mm 400Kg **£0.70ppm**
MASTRANT D3 Drum 100m 3mm 400Kg **£59.95**
MASTRANT D4 4mm 800Kg **£1.25ppm**
MASTRANT D4 Drum 100m 4mm 800Kg **£99.95**

Cable

RG58 Standard, 5mm, 50 ohm, per metre **£0.35**
RG58-DRUM Standard, 5mm, 50 ohm, 100m reel **£24.95**
RG58M Mil spec, 5mm, 50 ohm, per metre (best seller) **£0.60**
RG58M-DRUM Mil spec, 5mm, 50 ohm, 100m reel **£39.95**
RGMINI8 Mil spec, 7mm, 50 ohm, in grey per metre (amateur favourite) **£0.75**
RGMINI8-DRUM Mil spec, 7mm, 50 ohm, in grey 100m reel **£64.95**
RG213 Mil spec, 9mm, 50 ohm, per metre **£1.20**
RG213-DRUM Mil spec, 9mm, 50 ohm, 100m reel **£99.95**
H100 Mil spec, 10mm, 50 ohm, per metre **£1.40**
H100-DRUM Mil spec, 10mm, 50 ohm, 100m reel **£129.95**
WESTFLEX103 Mil spec, 10mm, 50 ohm, per metre **£1.50**
WESTFLEX103-DRUM Mil spec, 10mm, 50 ohm, 100m reel **£139.95**
TV100U Mil spec, 6.7mm, 75 ohm, per metre **£0.60**
TV100U-DRUM Mil spec, 6.7mm, 75 ohm, 100m reel **£49.95**
300-M Ladder Ribbon, best USA quality, 300 ohm, per metre **£0.85**
300-20M Ladder Ribbon, best USA quality, 300 ohm, 20m pack **£14.95**
300-DRUM Ladder Ribbon, best USA quality, 300 ohm, 100m reel **£59.95**
450-M Ladder Ribbon, best USA quality, 450 ohm, per metre **£1.00**
450-20M Ladder Ribbon, best USA quality, 450 ohm, 20m pack **£17.95**
450-DRUM Ladder Ribbon, best USA quality, 450 ohm, 100m reel **£69.95**
FW-M Original high quality flexweave antenna wire, 2mm, per metre **£0.75**
FW-100 Original high quality flexweave antenna wire, 100m reel **£49.95**
FWPVC-M Original PVC coated flexweave antenna wire, 4mm, per metre **£1.00**
FWPVC-100 Original PVC coated flexweave antenna wire, 4mm, 100m reel **£69.95**

Antenna Wire (50m)

Perfect for making your own antennas, traps, long wire aerials etc.

SEW-50 Multi stranded PVC covered wire, 1.2mm **£14.95**
SCW-50 Enamelled copper wire, 1.5mm **£19.95**
HCW-50 Hard Drawn bare copper wire, 1.5mm **£24.95**
CCS-50 Genuine Copperweld copper clad steel, 1.6mm **£24.95**
FW-50 Original Flexweave bare copper wire, 2mm **£29.95**
FWPVC-50 Original clear PVC covered copper wire, 4mm **£39.95**

Rigging Accessories

Get rigged up, for full list of all options visit our website!

PULLEY-2 Adjustable pulley wheel for wire antennas, suits all types of rope **£19.95**
GUYKIT-HD10 Complete heavy duty adjustable guying kit to suit upto 40ft masts .. **£49.95**
GUYKIT-P10 Complete light duty/portable guying kit to suit upto 40ft masts **£29.95**
SPIDER-3 Fixed 3 point mast collar for guy ropes **£3.95**
PTP-20 Pole to pole clamp to clamp up to 2" to 2" **£5.95**
DPC-W Wire dipole centre to suit either 300 or 450ohm ladder line **£4.95**
DPC-S Wire dipole centre with SO239 to suit cable feed connections **£5.95**
DPC-A Dipole centre to suit ½ inch aluminium tube with terminal connections ... **£6.95**
DPC-38 Dipole centre with SO239 socket with two 3/8th sockets to make mobile dipole **£5.95**
DOGBONE-S Small ribbed wire insulator **£1.00**
DOGBONE-L Large ribbed wire insulator **£1.50**
DOGBONE-C Small ceramic wire insulator **£1.00**
EARTHROD-C 4ft copper earth rod and clamp **£19.95**
EARTHROD-CP 4ft copper plated earth rod and clamp **£14.95**
G5RV-ES In-line SO239 replacement socket for 300 or 450 ohm ladder line **£4.95**
AMA-10 Self amalgamating tape for connection joints, 10m length **£7.50**

Mounting Hardware & Clamps

We have all the mounting brackets you could possible want – for all options see our website

TRIPOD-HDA Free standing, heavy duty, fold away tripod, which adjusts from 50-65mm **£149.95**
TRIPOD-25L Free standing heavy duty tripod to suit masts 65mm or less **£69.95**
TRIPOD-20L Free standing heavy duty tripod to suit masts 2 inch or less **£59.95**
TRIPOD-15L Free standing heavy duty tripod to suit masts 1.5 inch or less **£54.95**
TK-36 Heavy duty galvanised pair of T & K brackets, 36 inches total length **£49.95**
TK-24 Heavy duty galvanised pair of T & K brackets, 24 inches total length **£24.95**
TK-18 Heavy duty galvanised pair of T & K brackets, 18 inches total length **£19.95**
TK-12 Heavy duty galvanised pair of T & K brackets, 12 inches total length **£17.95**
SO-9 Heavy duty galvanised single stand off bracket, 9 inches total length **£9.00**
SO-6 Heavy duty galvanised single stand off bracket, 9 inches total length **£6.00**
CHIM-D Heavy duty galvanised chimney lashing kit with all fixings, suitable for upto 2 inch **£19.95**
CAR-PLATE Drive on bracket with vertical up stand to suit 1.5 or 2" mounting pole .. **£19.95**
CROSS-2 Heavy duty cross over plate to suit 1.5 to 2" vertical to horizontal pole **£14.95**
JOIN-200 Heavy duty 8 nut joining sleeve to connect 2 X 2" poles together **£16.95**
PTM-S Pole mounting bracket with SO239 for mobile whips, suits upto 2" pole . **£19.95**

Antenna Rotators *See website for full details*

We stock all the most popular rotators to suit all requirements

AR-300XL Great entry level rotator, but strong enough for all VHF/UHF yagi antennas **£79.95**
Yaesu G-250 Entry level again from Yaesu, ideal for all VHF/UHF yagi antennas.... **£139.95**
Yaesu G-450 Medium duty rotator complete with 25m of control cable **£319.95**

bhi

NES10-2MKII noise eliminating speaker **£99.95**
The NES10-2MKII Noise Eliminating Speaker removes unwanted background noise, hiss, hash computer hash, plasma TV interference, white noise etc from speech so that you can hear the speech much more clearly.
DESKTOP "noise away" robust base station speaker **£154.95**
The Desk Top "Noise Away" is a stylish robust base station speaker for use in radio communications, especially amateur radio

Telescopic Masts (aluminium/fibre-glass opt)

TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ Approx 20ft erect 6ft collapsed **£119.95**
TMA-2 Aluminium mast ★ 8 sections 170cm each ★ 65mm to 30mm ★ Approx 40ft erect 6ft collapsed **£199.95**
TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ Approx 20ft erect 6ft collapsed **£129.95**
TMF-1.5 Fibreglass mast ★ 5 sections 200cm each ★ 60mm to 30mm ★ Approx 30ft erect 8ft collapsed **£179.95**
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★ Approx 40ft erect 9ft collapsed **£199.95**
TMF-3 Fiberglass mast * 6 sections 240cm each * 65-23mm * Approx 50ft erect 9ft collapsed **£249.95**

Portable Telescopic Masts

LMA-S Length 17.6ft open 4ft closed 2-1" diameter **£79.95**
LMA-M Length 26ft open 5.5ft closed 2-1" diameter **£89.95**
LMA-L Length 33ft open 7.2ft closed 2-1" diameter **£99.95**
TRIPOD-P Lightweight aluminium tripod for all above **£44.95**

20ft Mast Sets

(5ft Sections)

These heavy duty masts sets have a lovely push fit swaged sections to give a strong mast set. Ideal for portable or permanent installations . . . also available singly

MSP-125 4 section 1.25inch OD mast set... **£29.95**
MSP-150 4 section 1.50inch OD mast set... **£39.95**
MSP-175 4 section 1.75inch OD mast set... **£49.95**
MSP-200 4 section 2.00inch OD mast set... **£59.95**
MSPX-150 4 section 1.50 inch 5mm scaffold gauge (very heavy duty) **£69.95**

Patch Leads

PL58-0.5 ½m Standard RG58 PL259 to PL259 lead **£2.95**
PL58-10 10m Standard RG58 PL259 to PL259 lead **£7.95**
PL58-30 30m Standard RG58 PL259 to PL259 lead **£14.95**
PL58M-0.5 ½m Mil Spec RG58 PL259 to PL259 lead **£3.95**
PL58M-10 10m Mil Spec RG58 PL259 to PL259 lead **£10.95**
PL58M-30 30m Mil Spec RG58 PL259 to PL259 lead **£24.95**
PL213-10 10m Mil Spec RG213 PL259 to PL259 lead **£14.95**
PL213-30 30m Mil Spec RG213 PL259 to PL259 lead **£34.95**
PL103-10 10m Mil Spec Westflex 103 PL259 to PL259 lead **£29.95**
PL103-30 30m Mil Spec Westflex 103 PL259 to PL259 lead **£59.95**

(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

Connectors

PL259/6mm Standard plug for RG58 ..... **£0.75p**
PL259/9mm Standard plug for RG213 ..... **£0.75p**
PL259/7mm Standard plug for Mini8 ..... **£1.00p**
PL259/6C Compression type for RG58 ..... **£2.50p**
PL259/9C Compression type for RG213 ..... **£1.95p**
PL259/103C Compression type for Westflex 103 ..... **£5.00**
NTYPE/6 Compression type plug for RG58 ..... **£3.50**
NTYPE/9 Compression type plug for RG213 ..... **£3.50**
NTYPE/103 Compression type plug for westflex 103 .... **£6.00**
BNC/6 Compression type for RG58 ..... **£1.50**
BNC/9 Compression type for RG213 ..... **£3.50**
SO239/N Adapter to convert PL259 to N-Type male **£3.50**
NTYPE/PL Adapter to convert N-Type to PL259 ..... **£3.50**
BNC/PL Adapter to convert BNC to PL259 ..... **£2.00**
BNC/N Adapter to convert BNC to N-Type male **£3.50**
BNC/SMA Adapter to convert modern SMA radio to suit BNC.... **£3.95**
SO239/SMA Adapter to convert modern SMA radio to suit SO239.. **£3.95**
PL259/38 Adapter to convert SO239 fitting to 38th thread.... **£3.95**

ALL PICTURES ARE FOR REFERENCE ONLY

Trains and Boats and Planes

Ham Radio Show in Friedrichshafen 2010

The ferry terminal in Friedrichshafen is just a short walk from all the local hotels.

HAM RADIO 2010. Around 16,800 visitors attended the 3-day amateur radio show in Friedrichshafen this year; although it seemed the number of UK visitors were down a little. In the three halls there were 185 exhibitors from 29 countries, including many IARU National Societies. For the first time, all exhibitors with new products were put in the same hall, whereas in the past many of the smaller traders were in the fleamarket. This seems to have brought more visitors past the stands of the usual main hall exhibitors. There were two halls of fleamarket traders and these halls were busy most of the time with visitors searching for bargains.

TRAVEL. In recent years, visitors from the UK have been able to fly direct from Stanstead into Friedrichshafen airport, courtesy of RyanAir. It's been a relatively cheap and straightforward way of getting there and several flights out were very busy with radio amateurs. Earlier this year, RyanAir cancelled this route and I think this put some UK visitors off the idea. But what are the alternatives?

Several groups drove down to southern Germany which is, realistically, a 2-day trip. It's not a difficult drive (according to those who made the trip), although the toll roads through France can be expensive so some took the Belgian route instead. Alternatively you can fly to Frankfurt and then fly on to Friedrichshafen – I didn't hear of any UK visitors who tried this method of transport.

By far the most popular was to fly to Zurich (many of us chose a Gatwick flight with Easyjet) and then catch a train to Romanshorn followed by a ferry trip across Lake Constance. This sounds very complicated and, I confess, I wasn't looking forward to it. As it turned out, there was nothing to be concerned about: it is such an easy trip to make! Zurich airport was a model of efficiency and it was very quick to get from the plane to the baggage hall and from there out to the airport concourse. The ticket office staff couldn't have been more helpful (in any number of languages!) and recommended a return ticket right through to Friedrichshafen to be the most cost-effective route.

The train station is under the airport so one escalator later and you are standing on the platform waiting for the train, which runs at very regular intervals. Not only does the train run regularly but the sailings of the ferry are timed to coincide with the train timetable so you have enough time to walk from the station, around the small dock at Romanshorn and onto the ferry. All very civilised!

Probably around twenty amateurs made the same trip and we soon sat in the sunshine as the ferry made its way across the lake. Around the same number were on the next train and ferry, having travelled from Luton. Many said how impressed they were at the ease of travel. And the cost? Depending on when you booked your tickets, the air travel was between £60 and £90 and the combined train and ferry around £48.

THE SHOW. The first day started with huge queues building up waiting for the doors to open. There must have been around six or seven hundred people in the entrance hall and a similar number outside – with more pouring from the free buses every few minutes. The buses run from the town to the Messe, which is where the show is held. It is possible to camp on site – camper vans, that is – and there was a Ham Camp organised for those young amateurs under the age of 27. A three day ticket to the show costs 15 Euro, with the opening hours being 9am to 6pm on the first two days and 9am to 3pm on the final day.

As far as UK visitors go, the fleamarket is a big draw. You could find everything from components to tweezers, old radios to solder. A good deal of haggling seems to go on and many seem to come away from the show laden down with their purchases. Another plus for the UK visitor is the lectures – several are in English too. This year there was a talk on the European balloon project, IOTA, the extreme radio station at VE6JY and a DX Forum.

There are both UK traders and names you would recognise at the show – bhi, Waters & Stanton, Icom Europe, Kenwood

The Qatar Amateur Radio Society and the Union of Gulf Nations were represented for the first time.

Europe and Yaesu Europe, WiNRADiO, FlexRadio, Luso Towers and Kuhne Electronics, to name but a few.

ON DISPLAY. Some of the biggest stands in the main hall belonged to the European arms of the three main manufacturers. Icom Europe had an IC-9100 on display, although it was in a glass cabinet so you couldn't try it out. Yaesu Europe had gone one better because they had a FTdx-5000 on their stand, working and available for visitors to try. Sadly, it didn't mean that European versions are imminent as the one on display had been brought over from the US and set up for the European market. Staff on the stand were confident that Europe would start seeing versions of the FTdx-5000 in the "late summer". Kenwood Europe also had a prototype of the TS-590S on their stand – again, it was plugged in and working for visitors to try.

Visitors seemed to enjoy the opportunity to try out these new radios ahead of their European launches. The stands were busy almost all day and people queued up to ask questions. Several UK amateurs said that if the radios haven't been launched before the National Hamfest in early October, perhaps UK amateurs will get the chance to see these radios up close too!

It was good to see a large Hilberling display with their black, red and blue cased radios. It looks like the Hilberling radio may soon be making its way onto the market.

SOFTWARE DEFINED RADIO. This seems to have been the year of the software defined radio with more new models on display than I've ever seen before. Microtelecom (of Perseus fame) was advertising their new model called the Gemini. It's a dual channel, 200 MSPS sampling receiver suitable for HF and VHF monitoring, direction finding, synchronous channel receiving system and noise nulling. Then there is the PMSDR from RF Systems. This is an SDR kit for all the HF bands from 0.1 to 55MHz and is also available from IK2GAO on eBay. WoodBox Radio also had leaflets on forthcoming SDR equipment; theirs is the SDT-2010. It's an HF and 50MHz Software Defined Transmitter, RF & DSP project for the amateur bands between 1 and 60MHz. They also make accessories for SDR equipment such as the Tmate, which is a piece of equipment that provides the user with a tuning control that allows the control of main functions of the various SDR software. The latest piece of equipment they will be producing is a VHF/UHF down converter that can be used as a standalone dual band down converter or as a USB CAT-controlled down converter.

Of course, WiNRADiO were there demonstrating the Excalibur. They had one unit set up so visitors could try out the receiver, see what the computer display looks like and ask questions about the equipment. All the range of FlexRadios were being demonstrated, including the new FLEX1500, which is a small QRP (5W) version described as the best priced entry level radio.

The soldering benches were very popular in the main hall and as soon as one young person left with their completed project, another soon filled the space.

The Hilberling HF radio being demonstrated by Hans Hilberling. We should see this radio in the UK before the end of the year.

The ladies from Luso towers came in traditional costume. Both towers that came to Germany were sold before the end of the show.

NATIONAL SOCIETIES. The Ham Radio show is a good chance to meet members of other National Societies as many of the IARU Region 1 countries are represented. Making their first appearance representing their country was the Qatar Amateur Radio Society. Sabaan Mismar Al-Jassim, General Secretary QARS, was pleased with their visit, saying, "This was our first time here in Friedrichshafen representing the Qatar Amateur Radio Society and the Union of Gulf Nations. We were impressed with Ham Radio because visitors came here to exchange ideas and talk about their future projects".

Many of the Society stands were decorated with leaflets and posters showing the beauty of the country or their amateur radio exploits. It is also common to be able to try local delicacies too such as 'real' Turkish delight – nothing like the confectionary usually found in the UK – olive oil from Greece, various unnamed drinks from the Baltic nations as well as fruit, biscuits and cakes from around Europe. These National Societies often have a tiny budget to work with, are almost completely staffed by volunteers and are dealing with very difficult regulatory departments. Getting together at an event like this gives them the opportunity to share ideas and look for solutions to problems they are facing.

APPEALING TO THE YOUNG. During the show, in all, 101 children and young people tried direction finding as a new element to amateur radio and 105 teachers took advantage of the teacher training available. This is the fourth year that this has been part of the show and is a series of workshops where teachers can learn how to incorporate scientific and technical content into their lessons in an entertaining way. An overnight camp was organised for young people where they ran a wide variety of activities throughout the evening and following day. The soldering benches were very popular in the main hall and as soon as one young person left with their completed project, another soon filled the space. The other activity that was very popular was Morse training. The German Society, DARC, was playing a Morse learning sound track in

The new radios from Yaesu and Kenwood were connected and working for visitors to try.

Seen here are the RSGB staff, General Manager, Past President and President with the members of the Horsham Amateur Radio Club.

between many of their presentations on the foyer stage. It's unusual as it has a 'musical' backing track, very catchy, and seemed to appeal to the younger generation. It starts with the letters of the alphabet, moves onto numbers and finally punctuation. It's very difficult to describe, but it certainly seemed to work on the young people at the show. If you would like to listen or even download a copy of this *Rhythm of the Code* file, it's available as an MP3 file on the RSGB website at www.rsgb.org/newcomers in the Range of Technologies section.

MEETINGS. One of the benefits of having so many National Societies in one place is that it is easy to hold international meetings. Whether it's an update on EMC, the latest from EUROCOM (the specialist group tasked with maintaining contact with the European Union) or an IARU update, everyone is already there. RSGB General Manager Peter Kirby, G0TWW and RSGB President Dave Wilson, M0OBW attended a full day of meetings on the first day, possibly the most important was the EMC meeting. With representatives from several European nations it gave everyone that chance to update on what's happening in their own country. The European parliament says that there are around 40 million PLT units in the market place within Europe. So far, of the 208 complaints in the UK, all have been resolved, yet only around 100 complaints have been received within the rest of the European nations. Japan suffers least from PLT problems because their units are notched so well – not because there are laws to enforce this but the manufacturers don't want trouble from the many Japanese radio amateurs!

The consensus of the meeting was that it is important that PLT chip manufacturers want to notch the amateur bands. So amateur radio needs to make sure that the public understand what amateur radio can do. One of the biggest challenges for National Societies is to find a way of explaining EMC issues to not only amateurs but to the general public too. Ole Garpestad, LA2RR, Vice President of the IARU, said that he found that talks to local radio clubs on EMC are particularly successful in getting the message across. Taking audio files to these talks means that radio amateurs can hear what the interference sounds like, which means they understand the problems we are facing. It even can highlight that a radio amateur had been suffering from interference without realising it.

RadCom recently reported on the amateur radio exhibition in the European Parliament. This was one of the subjects at the EUROCOM meeting where it was conclude that the number of contacts made during the exhibition had exceeded expectations – and that's just amongst those who gave their names and asked questions on the subject and doesn't include those who just looked at the exhibition. The organisers feel that they have successfully linked amateur radio with emergency communications, education and space exploration in the minds of at least some of those who work in the European Parliament. This, hopefully, will be useful when policies cross their desks that affect amateur radio in the future.

SOCIAL ACTIVITY. During the show, several games in the World Cup were played and so the organisers decided to make a social event of this fact. Ham Night was a free event on the Saturday night that was full of live music and big screen football. And I suppose we should mention the game on Sunday afternoon between Germany and England. German celebrations are nothing like you would see at home. Thousands of cars taking to the streets, draped in German flags of every size imaginable – and the noise was quite unbelievable! Quite an end to a busy but very enjoyable trip.

NEXT YEAR. The next Ham Radio show in Friedrichshafen will be from 24 to 26 June 2011. For more information, visit www.hamradio-friedrichshafen.de, click on the UK/USA flag to be able to read things in English.

Members visiting the RSGB Stand at Friedrichshafen 2010

EI9DZ/G4KOQ	LZ1ZQ	G6HFS
G3TTC	G4LUE	ON4RK
G0DWV	G7SME	IZ2QDH
G3YBO	G6FJP	EI8JB
G0GGM	9A3PG	IZ2HSW
G0CUT	ON7BGO	G0VDZ
PA3AGF	M0TZO	M0ZAR
PA3ACJ	G3KHZ	G6WZA
G4EFO	GI4VIV	DL8WX
2E0DDW	EI7JO	G4IRN
2E0BTO	G3WKL	G1DRG
S51NM	W1AEL	M0CAD
SM6DER	I8LWL	G3YHM
DL9HAL	5CZL	G3PSM
G3OGP	W0LWL	IZ8DBJ
DL1QO	TS8P	IZ6DDL
G3SWC	SP5HS	M0CFW/JK3GAD
G4IUA	DL9SAW	DL9WR
G4TMC	GW0ANA	DL2AK
M1KTA	VU2MY	IZ4ORS
G4LRP	VU2BMB	IQ1PCH
G4SOB	G7LLQ	IW1RIX
PA0ME	G8LUL	G0DMP
GW3XJQ	GU0SUP	M0CZR
HB9ZAP	G5KC	LA5GOA
GW4HAT	G2YL	W7VJ
SP8I	EA8CPN	G1JKE
SP1QY	DL3RR/M1CPL	PY4RGS
SP1FTH	G3OZZ	IZ2SVN
2E0WKZ	G6XRE	EI2CR
G4MEM	G6SSX	IZ1HGH
G8DZH	4Z5LA	HB9TWZ
G3VGR	GM3YTS	IT9XGU
ZC4VJ	G5LP	J9VGW
G6MC	G7LWT	EI7CD
MM0WKR	G6CTC	TA1HZ
G3PNJ	HA4TL	GM4WZG
G3ISB/DJ0OK	G4XRV	VK4HB
M0LMH	A65BD	OK4MM
G3LQP	G4ERO	G4KDR
KL0JW	IK3HHX	MW0BXJ
G8XDU	DL2YDP	GW6STK
G4HGI	GW6STK	GW1SGG
GU6EFB	GW1SGG	DL6KCR
F6BKD	M1BXF	F5PXF
HB9ICG	G1SAA	EB3FJK

The festivities after the football!

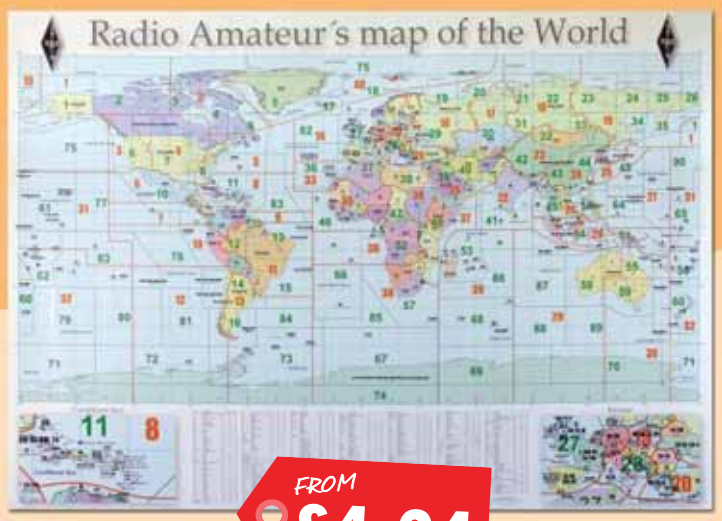
RSGB shop

NEW

World Prefix Map

- Radio Amateurs Map of the World

Special Purchase



FROM £4.24

This top quality map is 980x680mm and printed on top quality silk finished paper. Not only does this map show the location of worldwide prefixes there is an A-Z list of prefixes and expanded map sections covering the Caribbean and Europe making them much easier to read. The handy countries list also shows the DXCC entities with their continent along with which CQ and ITU region that they fall in. The map is also overlaid with grids both CQ and ITU zones and a handy annotation of the hour +/- UTC. Printed by the Czech Radio Club this world prefix map is a very impressive 38" (98cm) across and is in a 1: 42,000,000 scale.

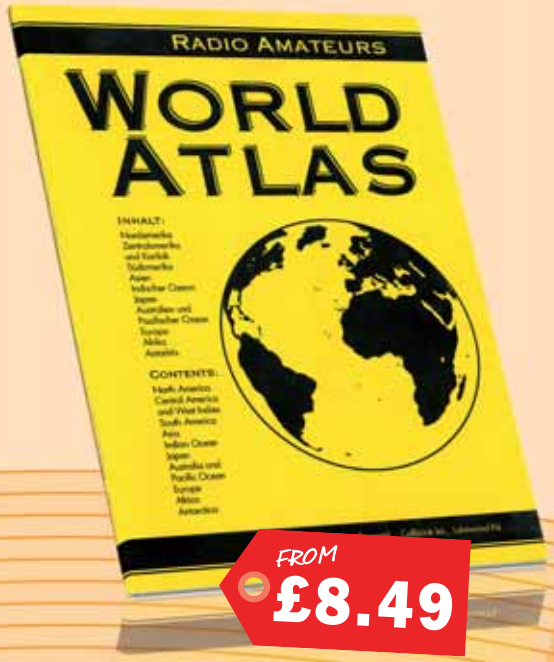
This map is top quality yet at a special low price, so buy one (whilst stocks last) to get a great map that will grace the wall of any shack.

Non Members' Price £4.99

RSGB Members' Price £4.24

(Whilst Stocks Last)

Radio Amateurs World Atlas



FROM £8.49

If you want more than a wall map when searching for that elusive prefix the *Radio Amateurs World Atlas* provides it. Want to know where that KH3 callsign on Johnston Island is? Simply check the index and turn to page 15 for a detailed map of the Pacific Ocean. What about the VE6 call - which part of Canada is that? Page 5 shows it is in British Columbia. With 16 full colour maps detailing the entire globe the showing country boundaries, callsign prefix boundaries, CQ zones, states and provinces the Radio Amateurs World Atlas provides this and more. Indexed with a list of all ITU-allocated as well as national prefixes this is a great shack accessory. From North America to Antarctica this book has detailed prefix maps for everyone.

Size 210x297mm (A4), 16 pages, ISBN 9783-8869-2020-4

Non Members' Price £9.99

RSGB Members' Price £8.49

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

Radioworld Ltd

34-42 Brook Lane, Great Wyrley, Walsall, WS6 6BQ
Tel: 01922 414796 Fax: 01922 417829 skype: radioworld_uk
E-mail: sales@radioworld.co.uk

KENWOOD

*** TM-D710E ***
Dual-Band Mobile
VHF/UHF - £439.00

TS-480SAT - HF&6m 100W... £748.00.
TS-480HX - HF & 6m 200W.. £848.00.
TS-2000 - HF/6/2/70cms..... £1448.00.
TS-2000X-HF/6/2/70/23cm... £1633.00.
TM-V7E - 2m/70cm's..... £367.95.
TH-F7E - 2mtrs/70cm's..... £229.00.
TM-271E-2m/FM Mobile TX/RX £169.55.
TM-V71E - VHF/UHF Trx ..... £288.95.

ICOM

IC-7600 HF 6m transceiver....£3149.00.
IC-7700 HF & 6m Base £5495.00
IC-7800-2 HF/50MHz 200W.....£7795.00.
IC-7200 HF+6m 100w.....£799.00.
IC-7000 - HF/6m/2m/70cm's.....£1089.00.
IC-718 - HF 100W.....£519.00.
IC-910H - 2M 100W/70cm 75W £1265.00.
IC-E91 - Top Flight Handheld....£254.00.
IC-706M2G - All-Mode TX/RX ....£795.00.
IC-E90 - 2m/6m/70cm Handheld £235.00.
IC-E2820 Dualband VHF/UHF £424.00.
IC-RX7 wideband receiver ...£213.00.
IC-R6 wideband receiver ..... £199.00.
ID-E880 2/70 digital mobile...£435.00.
IC-E92D D/STAR HANDY ..... £358.00.
IC-V80E 2M HANDHELD..... £119.00.
ID-1 MOBILE TRX 23CM/FM.... £704.00
IC-T70E 2M/70CM HANDY £179.00
IC-E80D D-STAR V/U £369.00
PW-1 HF AMP 1KW £3995.00

YAESU

Choice of the World's top DX'ers™

VX-8 tri-band handheld £299.00
FT-950 HF Transceiver..... £1119.00
FTM-10E - VHF/UHF tx/rx ... £265.00
FT-897D - HF/6m/2m/70cm.. £659.00
FT-817ND - 1.8-430MHz 5W. £439.00
FT-857D - HF/6m/2m/70cms £575.00
FT-7900 mobile VHF/UHF £229.00
FT-8800E - 2m/70cm mobile. £288.99
FT-8900 - 10m/6m/2m/70cm. £329.00
FT-1900 - 2m 55W mobile.. £129.95
FT-2900M - 2m 75W mobile.. £138.00
VX-7R - 6m/2m/70cm handy. £256.00
VX-6E - 2m/70cm handheld.. £199.00
VX-3E - 2m/70cm handheld.. £139.00
FT-60E - 2m/70cm FM 5W .. £145.00
FT-450 - HF/6m transceiver. £585.00
FT-450AT transceiver..... £639.00
VX-8DE handy with APRS £399.95
FT-2000 HF/6M Base 100W £2059.00
FT-2000D 200W HF/6M Base £2595.00
VR-5000 - Base receiver £479.00
ATAS-120 - Antenna system .. £337.00
DMU-2000 - Data system £842.00
SP-2000 Base speaker (FT2000) £135.00
MD-200-A8X - Base mic £204.00
MD-100-A8X - Base mic £148.00
VL-1000 Quadra 1kw Amp ... £4085.00
FC-30 Auto ATU for FT-897D.. £224.00
FP-30 AC PSU for FT-897D £224.00

MFJ

MFJ-989D 1500W Auto ATU..£389.95
MFJ-986C 3Kw HF.....£349.95
MFJ-993B dual 300/150 Auto £249.95
MFJ-991B Auto Intellituner....£209.95
MFJ-976 1500w ATU £469.95
MFJ-969 300w Rollercoaster £209.95
MFJ-962D 1.5Kw Inductor.....£289.95
MFJ-949E 300w W/D-Load....£179.95
MFJ-948 300w HF.....£162.95
MFJ-945E Mobile £128.95
MFJ-941E 300w £139.95
MFJ-934 ATU+AG £298.95
MFJ-921 2m ATU.....£96.95
MFJ-924 70cms £96.95
MFJ-914 Extender £89.95
MFJ-901B 200w Versa tuner....£109.95
MFJ-1026 Active Antenna £199.95
MFJ-267 Dummy Load / SWR - £159.95
MFJ-802 Field Strength Mtr..... £54.95

MFJ - Analysers And Dummy Loads

MFJ-249B 1.8-170 Dig.....£264.95
MFJ-259B 1.8-170 .....£279.95
MFJ-269 HF/VHF/UHF £349.95
MFJ-201 grid dip meter.....£156.95
MFJ-269PRO 1.8-170&430-520 £399.95

MFJ-250 1kw Oil filled £77.95
MFJ-250X 1KW without oil £55.95
MFJ-260C 300w PL259 .....£44.95
MFJ-260CN 300w N-Type £53.95
MFJ-264 1.5kw PL259 .....£76.95
MFJ-264N 1.5kw N-Type £85.95
MFJ-267 Load/VSWR £159.95

RigExpert

RigExpert Standard..... £149.00
RigExpert Plus £199.95
AA-230 Antenna Analyzer..... £410.00
AA-230 Pro Antenna Analyzer..... £450.00
AA-520 Antenna Analyzer £450.00
AA-500 ANTENNA ANALYSER £562.00

HEIL SOUND

PR-781-PTT deluxe base mic...£129.96
Pro-Set-Plus Headset £189.95
Pro-Set-Plus-IC Headset £194.95
Pro-Set-HC-4/5 Headset £114.49
Pro-Set-HC-IC Headset £132.95
Goldline GM-4 Stick mic £119.95
Goldline GM-5 Stick mic £119.95
HM-4 Handy mic w/HC-4 insert £79.95
HM-5 Handy mic w/HC-5 insert £79.95
HM-IC Handy mic + Icom insert £79.95
HM-10-4 Hand mic + HC-4 .....£79.95
HM-10-5 Hand mic + HC-5 .....£79.95
PR-30 hand microphone £189.95
PR-40 hand microphone £249.95

TigerTronics

SL-USB-13PDI 13pin DIN for Icom..£94.95
SL-USB-13PDK 13pin Kenwood....£94.95
SL-USB-4R 4pin round mic cable..£89.95
SL-USB-5PD 5 pin round mic cable £89.95
SL-USB-6PMD 6pin m/DINYaesu £94.95
SL-USB-8PD 8pin m/ DIN.....£89.95

COMET

Comet H422 - High power 1Kw, 4 Band Rotary V Dipole. Frequencies : 7,14,21,28 Mhz £269.95

CHA250B broadband vertical, covers 80-6m, no gaps £299.95.

Comet V-250 3.5-54MHz Max 200w. Ideal for limited space £299.95.

GP-6 High Gain Dualband CoLinear 2/70cm Max 200w £99.95

GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w £99.95

WATSON

POWER-MITE NF Watson 22A, £69.95

W-25AM 25A Supply.....£89.95
W-10AM 10A Supply £59.95
W-5A 5A Supply £29.95
W-3A 3A Supply £24.95
W-10SM 10A Supply £61.95

WATSON

W-30 2/70 Base £49.95
W-50 2/70 Base £54.95
W-300 2/70 Base £74.95
W-2000 6/2/70 Base £89.95

Butternut | BENCHER, INC.

Butternut HF-2V 40/80m £289.95
Butternut HF-6V 80-10m £389.95
Butternut HF-9V 80-6m £449.95
Butternut HF-5B 20-10m £449.95
STR-II radial kit £156.49
A-17-12 17&12 ad for HF6V £71.99
A-6 6m ad for HF6V-X £24.95
TBR-160S 160m HF2/6/9V £169.99

HUSTLER

Hustler 5-BTV £219.95
Hustler 4-BTV £179.95
Hustler 6-BTV £259.95
Hustler RM-10 10m resonator £22.49

PALSTAR

AT-1KP Digital Display £419.95
AT-1500DT 1500w ATU £524.95
AT-2K 2000W ATU £579.95
AT- Auto 1500 Watt ATU £809.95
AT5K 3500 Watt ATU £1079.95

Miracle Antenna

Miracle Whip £112.49
Miracle Ducker IL £112.49
Miracle Ducker PL £112.49
Miracle Ducker TL £132.79

AUTO TUNERS

AT-1000 Pro

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

£495.95

Z-100 Plus

125w Auto ATU - 1.8-54MHz - 0.1 - 6 secs

£137.93

DM-7800

Dual meter system made exclusively for the IC-7800. This will give you a true analogue meter

£132.95

Z-817 ATU

ATU specific for FT-817 Uses CAT / ACC port Powered by batteries 0.1 - 20w : 1.8 - 54MHz

£117.50

LDG IT-100

Icom ATU 125w Auto ATU - 1.8-54MHz 0.1-6 seconds Tune

£148.16

LDG baluns

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

£32.95

LDG ELECTRONICS

Radioworld - the longest-running LDG dealer in the UK!!

LDG ELECTRONICS

TONNA

Tonna 20505 6m 5el	£109.95
Tonna 20809 2m 9el	£74.95
Tonna 20811 2m 11el	£105.95
Tonna 20817 2m 17el	£135.95
Tonna 20909 70cm 9el	£69.95
Tonna 20919 70cm 19el	£89.95
Tonna 20921 70cm 21el	£109.95
Tonna 20635 23cm 35el	£89.95
Tonna 20655 23cm 55el	£109.05
Tonna 20745 13cm 25el	£94.95

West Mountain Radio

RIGblaster Pro	£295.49
RIGblaster Plus USB	£159.49
Nomic 8P	£69.99
Nomic RJ	£69.99
M4-CBL RG45/4Pin lead	£18.99
RIGRunner 10way 12v distribution board	£149.95

DIAMOND ANTENNA

HF10FX 10m Mobile	£49.95
HF15FX 15m Mobile	£49.95
HF20FX 20m Mobile	£49.95
HF40FX 40m Mobile	£49.95
HF80FX 80m Mobile	£52.95
CR8900 10/6/2/70	£97.95
CP6 Base 6m-80m	£339.95
X50 Base 2/70	£72.99
X200N Base 2/70	£114.95
X300 Base 2/70	£139.95
X7000 Base 2/70/23	£225.95

AMERITRON


AL-811XCE 10-160m 600w	£899.95
AL-811HXCE 10-160m 800w	£999.95
ALS600X Solid State 10-160m 600w	£1549.95
AL-1500XCE 10-160m 1.5KW	£3499.95
AL-1200XCE 10-160m 1.5KW	£3449.95
AL-82XCE 10-160m 1.5KW	£2699.95

RAPID WIRES

CW-160 160-10m (252ft)	£159.95
CWS-160 160-10m (133ft)	£149.95
CW-80 80-10m (133ft)	£129.95
CWS-80 80-10m (66ft)	£149.95
CW-40 40-10m (66ft)	£116.95
CW-40+ 40-10m (66ft)	£139.95
CW-20 20-10m (34ft)	£99.95
G5RV+ 80-10m	£79.95
G5RV-XF Fullsize	£69.95
G5RV-XH Halfsize	£54.95

SGC

SGC-230 200Watts

£490.00

SGC-230 HF	£479.95
SGC-500 HF	£1499.95
SGC-235 HF-500w	£1249.95
SGC-237 HF+6m	£319.95
SGC-237 Porta	£399.95
SGC-237 PCB	£289.95
SGC-239 HF	£209.95
MAC-200	£289.95

Rotators

G-2800SDX Rotator	£1021.95
G-450C Rotator	£305.49
G-550C Rotator	£268.95
G-650C Rotator	£346.49
G-1000DXC Rotator	£408.00
G-5500C Rotator	£481.95
AR-35X Hy-Gain rotator	£99.95
G-250 - Rotator	£111.29

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£99.95 per 100m Drum

RG58U	£0.70 per Metre
RG8 Super	£1.00 per Metre
RG213	£1.30 per Metre
W103 Westflex	£2.00 per Metre
RG-8 100 Metre Drum	£69.00
Flexweave 50m Flex	£29.95
Flexweave-PVC-50 50m	£39.95
Enamelled Copper Wire 50m	£17.95
Hard Drawn Copper Wire 50m	£24.95
Rotator Cable: - Color coded Cable	
3 core	£0.80 per Metre
7 core	£1.20 per Metre
8 core	£2.00 per Metre
DC Connecting Cable	
10A DC Cable	£0.50 per Metre
15A DC Cable	£0.65 per Metre
25A DC Cable	£0.90 per Metre
40A DC Cable	£1.35 per Metre

Telecom linear amplifiers

Self-contained, solid state

23CM150 23cms 150W	£1999
2M-HK 2m 500W	£1999
64-HK 6m&4m dualband 500W	£1999
70CM-HK 70cms 500W	£1999

CUSHCRAFT

X-7 - 20/15/10 7EL Yagi	£979.95
A3S - 20/15/10 3EL Yagi	£579.95
A4S - 20/15/10 Yagi	£699.95
A3WS - 12/17 3EL Yagi	£479.95
ASL-2010 13-32MHz Log	£869.95
MA5B - Mini Beam	£459.95
D-3 - 20/15/10 Dipole	£289.95
R-6000 - 6Band Vertical	£399.95
R-8 - 40-6m Verical	£559.95
MA5V - 10/20m Vertical	£279.95

Second Hand List.

Quality Used Equipment, 3 Month Warranty.
Best prices paid for your used equipment.

Amplifiers
Yaesu FL-2050 amp £99.00
Nietzsche NB-30W - RF Amplifier £59.00
TOKYO HY- POWER AMP HL-37V £69
Phi Hong 13.8 volt 3 amp Psu £15.00
Kenwood VB-2200GX 2M Amp £79.00
Dentron MLA-2500b 2KW HF Amp £999
Ameritron ALS-500 Solid State Amp £599
SPE EXPERT 1K-FA 1 KW Solid State Fully Automatic Linear Amp £2,495.00
Analyzers + SWR meters
Daiwa CN-103L Meter £59.00
Nissei RS-102 HF+2m SWR/Power Meter £40.00
MFJ-259B Antenna Analyzer £195.00
YW-3 SWR meter £30.00
Hanson FS-20D SWR Meter £45.00
Diamond SX-400 VHF-UHF SWR Meter £70
SWR-25 SWR & Power Meter £20.00
Oskerblock SWR-200B £49.00
Palstar ZM30 - Antenna Analyser £279
Antenna Tuners
Kenwood AT-120 ATU £99.00
Yaesu FC-20 Antenna Tuning Unit £175.00
LDG AT-1000 pro Autotuner £429.00
Icom AT-150 Auto antenna tuning unit £169.00
MFJ-989C MFJ 3kW ATU, ANTENNA TUNER. £299.00
Vectronics VC-300D Tuner with LED PEP Meter £199.00
MFJ-971 MFJ QRP Portable ATU, ANTENNA TUNER. £99.00
Antennae
ATAS-120A Active Tuning Antenna System for FT-897, F £219.00
5-BTV HUSTLER 80-10m Vertical 1kW £169.00
Set top TV antenna £3.00
EZ-TUNE-7000IBOX High Sierra Control box for £85.00
Mizuho UZ-77 Active Loop £79.00
Garex Angler Antenna £25.00
Moonraker SPX-100 Plus £25.00
CB
Harrier CB-HQ Home Base FM CB £99.00
Midland 38 UK £45.00
DAB Radio
Roberts RD-21 'Gemini 21' DAB & FM radio, black £49.00
Gemini 49 Digital Radio £40.00
Gemini 46 Digital Radio £39.00
Pure Evoke-1s DAB radio - Maple £65.00
Data Comms
Kamtronics KAM Multimode TNC £129.00
DC/Cig adapter/chargers
BC-135 Desktop Rapid Charger for IC-R3 £40.00
NC-386 Ni-Cd Battery Charger £20.00
Duplexer / Triplexer
Revex D24 duplexer 1.6-150 MHz £22.00
Comet CF-416B 144/430Mhz PL/NP Duplexer £25.00
TSA-6001 Duplexer £25.00
Filters (various)
Bremi BRL-10 - TVI Low Pass filter 27MHz £10.00
AEC LP-30 - Low Pass Filter £15.00
Workman TVI-2K Low Pass Filter £25.00
Handheld Transceivers
Icom IC-T7E Dual Band Handy £139.00
Kenwood TH-D7E Dual Band Handheld £240.00
IC-E91 Icom 2m/70cm Handheld Transceiver £209.00
Alinco DJ-V17E £105.00
DJ-193 Alinco 2m FM Hand Held £99.00
HF Transceivers
Yaesu FT-77 HF inc FM £275.00
Kenwood TS-50S £399.00
TS-480HX £669.00
Yaesu FT-767GX £599.00
Kenwood TS-570DG/E HF transceiver £599.00
Kenwood TS-850S /AT £699.00
Icom IC-740 HF Transceiver £389.00
IC-756PRO-MKIII Icom HF+6m £1,699.00
Yaesu FT-77 HF transceiver £299.00
Tentec Orion II HF transceiver with ATU £2,795.00
Yaesu FT-857D Multi-band Mobile £459.00
Icom IC-7700 - TRANSCEIVER £4,795.00
Yaesu FT-690R II £275.00
Mics and Speakers
SP-23 Kenwood Base Speaker £50.00
Yaesu SP-901 Loudspeaker £59.00
NES-10-2MKII bhi DSP Noise eliminating Speaker £79.00
HM-133 Remote Control Microphone for IC-E208 £44.21
extension speaker £9.99
EMS-47 Remote Control Hand Speaker/mic direct VFO in £15.00
ICOM SP-10 Mobile Speaker 5W 4 Ohms for IC-2725, IC- £30.00
Yaesu FSP-2 Speaker £25.00
Yaesu MH-32 Speaker-Mic £15.00
MFJ-295 £12.95
Morse keys / tutors
Morse Key £89.00
NATO Morse Key £199.00
Ex-Army Operators Unit £39.00
WT 8Amp No2 Mk3 Morse Key £30.00
Bencher Twin Paddle Morse Key £89.00
Other
AKD 6001 6m FM Trx £115.00
M/Mods 144/100 £149.00
Alinco DJ-X3 £89.00
FRT-7700 £69.00
EDC-16B adapter £9.99
SGC MAC-200 Antenna Controller
Auto-Tuner £220.00
Yaesu FV-901DM VFO £175.00
AOR SDU-5000 Spectrum Display Unit £349.00
CX-201 Diecast Coax Switch £10.00
Yaesu FV-101DM Digital Memory VFO £199.00
AOR ARD9000 Digital Voice Interface. £129.00
Midland 48 Plus Multi £69.00
IC-7800mk1 Icom HF + 6m Trx £5,295.00
MFJ-1817 2m/70cm Telescopic Rubber Duck 36.8cm long £22.00
CSC-83 Soft Carry Case for FT-817ND £15
Icom PS-85 Icom 20A 13.8V Switch Mode £159.00
YSK-7800 Seperation lead for FT-7800 £49.32
MB-62 Mobile Mounting Bracket (Main) for IC-706, IC- £10.00
Kenwood / Trio BPF-2A HF filter £25.00
DCI-145-2-H 2m Band Pass Filter £129.00
FL-101 9MHz Filter CW narrow 250Hz £60
8-BAND W2IHY Audio Processor £189.00
SC-45 Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
ALINCO ESC-28 £10.00
010-10117-02 Garmin GPS Carry Case £5
HS-800/PRO High Sierra Standard Control Box for 180 £75.00
BP-206 Lithium Ion Battery Pack for IC-R-20 & IC-R3 £30.00
HPS-900 934-935mhz POWER-SWR Meter £40.00
IC-MB5 mounting bracket £25.00
KT-790 Carry case £15.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
IC-R5 cloning cable £15.00
Eton S-350 Field Radio £65.00
CX-401 £35.00
CSC-88 Soft Case for VX-7R £10.00
Bremi BRL-5 - 3-way switch with 5Watt dummy load (52 £20.00
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Mizuho KX-2 antenna coupler £59.00
Yaesu SC-1 Station Console £89.00
Yaesu YO-100 Monitor Scope £199.00
MB-17A Quick Release Mount £25.00
Dee Comm Dummy Load £69.00
BRV-1 Mirror Mount £10.00
IC-7200 19 Inch Rack Mount With Speaker £99.00
Yaesu CSC-92 soft case £10.00
FBA-37 Alkaline battery case £12.00
25W Max Dummy Load £20.00
60W Max Dummy Load £30.00
300W Max Dummy Load £79.00
Antenna Switch £15.00
Aluminium Travel Case £15.00
Power supplies
Bnos 20AMP PSU £89.00
Kenwood PS-31 Power Supply £129.00
Watson W-25SM 22A PSU £59.00
Zurich DPS-2512 20-25amp PSU £70.00
PT-1012 Microset 12A 13.5 PSU £110.60
POWER-MITE £55.00
Seif PS-134,DC power supply £20.00
Farnell G-12 £59.00
W-5A Watson 5A 13.8V fixed PSU £24.00
Alinco DM-330MW Power Supply £79.00
Receivers
Yaesu FRV-8800 RX VHF Converter £299
AOR AR8600MkII £549.00
Yaesu FRG-100 HF Receiver £349.00
Alinco DJ-X2000 Intelligent Receiver £299
Icom IC-R5 Receiver £129.00
Icom IC-R8500 Receiver £1,099.00
AOR AR-3000A Wideband Receiver £450
AOR AR-3000 Wide Band Receiver £350
Kenwood R-5000 Communications Receiver HF £549.00
Lowe HF-225 HF receiver £299.00
Alinco DJ-X30 Scanning Receiver 100KHz - 1.3GHz £125.00
Roberts R-809 £45.00
Scanners
Bearcat UBC-278 CLT Scanner £99.00
GRE PSR-214 FM Base Scanner £99.00
AOR AR-8200Mk3 Scanner £319.00
Yaesu VR-5000 Scanning Receiver £419
Yaesu VR-500 100kHz-1300MHz £169.00
AOR AR-8200 Mk II £199.00
IC-R20 Icom Scanner Wideband £259.95
UBC-785XLT Scanner 25-1300MHz £209
USC-230 Uniden-Bearcat ScanCat 230 £106.34
Uniden UBC-180XLT £99
UBC-3500XLT Scanner £169.00
UBC-72XLT Scanner (No Close Call) £69
UBC-800XLT mobile scanner £229.00
PSR-255 GRE Handheld Scanner £50.00
Scopes
Yaesu YO-901 scope £299.00
VHF/UHF Transceivers
Icom IC-490E 70cms Mobile £250.00
Kenwood TS-271E £165.00
Yaesu FT-8100R 2m / 70cms Mobile Transceiver £220.00
Yaesu FT-897 Portable £569.00
Yaesu FT-690R II 6m transceiver £275.00
Kenwood TS-2000 HF/6/2/70 £1,099.00
Yaesu FT-480R 2m Transceiver £220.00
Yaesu FTV-901R Transverter £275
Yaesu FT-726R VHF/UHF Base £299.00
Kenwood TR-9130 2m Multi-Mode £249
Yaesu FT-817ND HF 6m VHF UHF 5W Transceiver £379.00
Icom IC-910H 2m/70cms base 100w £999
ICOM IC-2200H 144–146 £189.00
Icom IC-7000 1.8 - 70cms Mobile Transceiver - IC7000 £799.00
The TINY-2 MK-II - With Open Squelch Board £109.00
Kenwood TM-741E - VHF/UHF transceiver 144-146 / 430- £229.00
Yaesu FT-726R Base Transceiver 2/70/6m £399.00
TM-V71E - VHF/UHF Mobile . £219.00
DR-635E Alinco 2m/70cm FM Dual Band Mobile T £230.00
Virtual Radars
AirNav Radarbox 2009 version £299.00

bhi

ANEM amplified module	£124.99
1042 6-way switch box	£20.49
NEDSP-1061-KBD DSP module	£101.95
NEDSP-1062KBD Noise Module	£106.95
NEIM1031 Noise Module	£132.95
NES10-2 MK II speaker	£101.95
1090 Radiomate Keypad	£91.95

bhi

We also accept PayPal

Stock and prices accurate as of 05/07/2010. E&OE. For accurate, up-to-date prices please check our website before visiting our shop

http://www.radioworld.co.uk

skype at radioworld_UK.

Design Notes

A brand new column that picks up from In Practice and Short Circuits

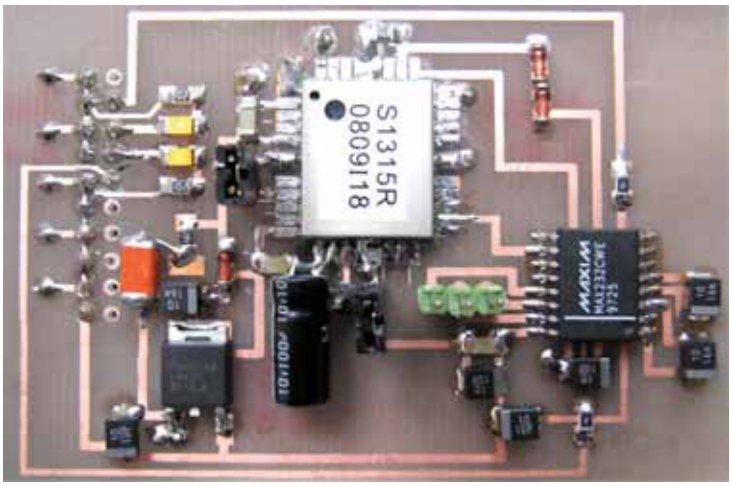


PHOTO 1: Interface produced by G8ACE for the RF Solutions 1513R GPS module.

BYE BYE SHORT CIRCUITS. Welcome to a new look column. Short Circuits has gone monthly and we've changed its name to more accurately reflect the future direction we hope to head along. Technical content that had previously been covered in the Data column will move here and add to the circuits and systems we already cover. This means that software defined radio, digital signal processing, software and related subjects won't now end up being shared between the two columns. Also, as we're monthly, there will be more scope for carrying over longer projects. Hopefully the new arrangement will give a more coherent approach where we will look at modern circuits and systems, design ideas and novel bits-and-pieces.

But please note, all the ideas, circuits and projects presented here will not necessarily have been tested, or not even completely built, or may even be flights of fancy given to stimulate ideas. This is an open-ended series, designed for experimenters and those who are prepared to fiddle about until something works. If you can find mistakes, errors, or have made improvements to anything here, please let us all know. Send in your ideas anyway...

SDR-IQ AS TEST EQUIPMENT. The SDR-IQ software defined radio is a popular mid-range unit with a few useful and well thought-out extras that make it more versatile than just being a radio receiver. For one thing, it makes a great, calibrated, spectrum analyser using the supplied *Spectravue* driver software from Moetronix **[1]**. In the 'SDR-IQ Settings' window, tick the check boxes for *Calibrated Gain* and *Use Fixed* settings. After that the display will show the absolute power level at the input to the receiver. Bandwidth of both the display and the resolution – which is equal to the noise bandwidth when used for noise power measurement – are independently variable within limits. The phase noise plot of **Figure 1** shows the SDR-IQ being used in a test equipment role.

MODERN SMALL GPS MODULE. Last time I showed how low cost MSF receiver modules could be recovered from clocks. I suggested that a PIC could then be used to read the output from these and convert to serial data, simulating that from a GPS receiver module used for timing. But it now looks as if that route may not even be necessary. John Hazell, G8ACE, was searching for a GPS receiver to specify as part of the reverse DDS solution he developed jointly with G4NNS **[2]** for locking microwave sources. The GPS receiver would be needed to supply a precise one pulse-per-second timing signal to lock a master oscillator. Time-of-day information from the GPS receiver would be used for synchronising data mode transmissions such as JT4G that is now appearing on several microwave beacons in the UK.

John found a range of low cost miniature GPS modules at prices comparable to second hand surplus versions of older ones. He writes:

"The RF Solutions 1513R module **[3]** is described as a 65 channel receiver module and is an attractive option when GPS timing signals are required for incorporating into a beacon running WSJT data mode transmissions or for OCXO frequency stabilisation. It does require some surface mount skill to incorporate the module into a project as it is only the size of a postage stamp. However it easily outperforms older used GPS modules which are often adopted for amateur projects and is available new at a similar price. Its RF sensitivity is such that a passive antenna may be used as easily as a 3.3V active antenna. The module requires a 3.3V DC supply so a dedicated regulator may be needed. Output is in NMEA format as low voltage TTL, so a translator is required to drive the COM port of a PC if commands are to be sent (either using *Hypertrm* or a dedicated PC program). If used for generating WSJT modes, then it's possible the default settings on the module can be used so that no PC controller is required. For use with a PLL to discipline OCXOs the 1 PPS signal will need to be turned on and saved so that it becomes available at power up. Typical time to first fix is 29 seconds from a cold start, and hot start with backup battery can be as short as 1 second. Update rate can be as fast as 10Hz if required but the standard 1 second is default. Communication is 9600 baud by default but easily set by link to 4800."

A prototype PCB has been produced for a WSJT JT4 beacon applications where it sits on the 20 pin control expansion socket of the main module (**Photo 1**). Power and timing signals are connected directly between main PCB and sub module. The spare channel in the RS232 translator chip is used as the 1PPS line driver.

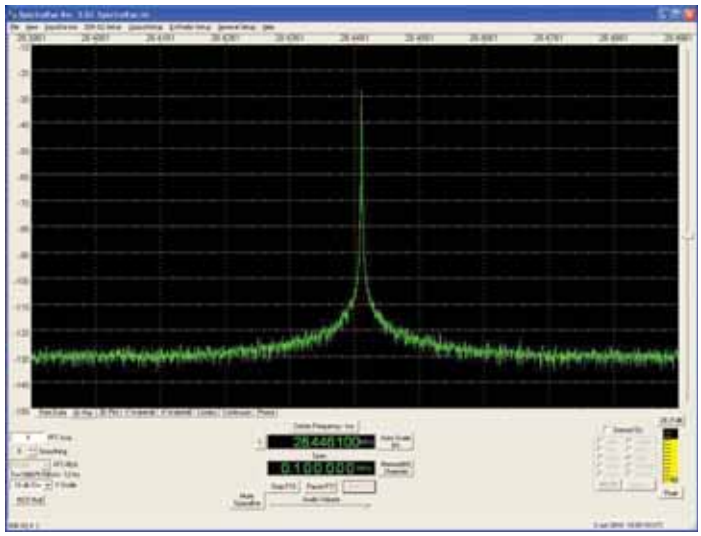


FIGURE 1: Phase noise plot of the free-running 432MHz VCO (downconverted to 28MHz – see text).

PHOTO 2: 5HW two-chamber helical resonator suitable for VCO use.

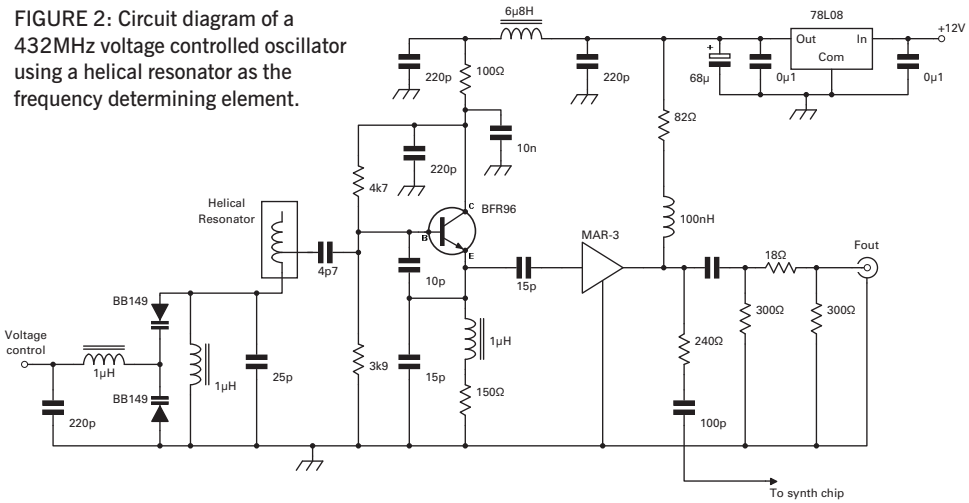


FIGURE 2: Circuit diagram of a 432MHz voltage controlled oscillator using a helical resonator as the frequency determining element.

HELICAL RESONATORS IN VCOs. Voltage controlled oscillators (VCO) form a fundamental part of frequency synthesiser design. A good low noise VCO is at the heart of a successful design. A good oscillator needs a good high Q resonator as it is this part of the circuit that more than anything affects the phase noise contribution to the whole synthesiser. I wanted a low noise synthesiser for a 432MHz source that would only have to tune over a narrow range of a few tens to hundreds of kHz, but would have to be repeatable – ie not too many select-on-test component changes at build-time. Good design practice dictates that you should always adopt as low a voltage tuning sensitivity as possible to minimise the effect of noise and spurious signals from affecting the VCO spectrum. However, a narrow voltage controlled tuning range means that the actual inherent stability of the resonant structure must be good to start with and it must not drift outside the pulling range of the voltage tuning. It must also be capable of being set on the correct frequency, easily, at build time. LC oscillators are rarely stable enough, so an excessively wide voltage tuning range would be needed to keep them within the synthesiser lock range. I tried a length of semi-rigid cable as the resonator, but it required too much in the way of setting up; also, reports suggest coax cable resonators are in fact quite low Q structures, even worse than some LC designs. So what else was there that could be tuned over the 432MHz band but was near-enough on the correct frequency to start with and had a high enough Q. How about of an off-the-shelf helical resonator, normally designed as drop in bandpass filters such as those from Toko? BEC **[4]** have a range of such units but, more importantly, they frequently turn up as surplus in items of equipment to be found at rallies – being used in just about every UHF radio made in the last few decades.

Photo 2 shows a typical two-chamber resonator. Each chamber has two ports. One is normally connected to ground and the other is a 50Ω input/output port, tapped part way up the enclosed helical resonator structure. Tuning is via the screw at the top. Could one of these high-Q units form the basis of a restricted tuning range VCO – and would it be stable enough mechanically and over temperature? The junk box revealed several salvaged units that had been recovered from small UHF modules found at one of the many rallies over the years. In normal bandpass filter configurations these would tune over 430 – 460MHz and appeared to be very similar to the 5HW series from Toko.

Figure 2 shows how one resonant chamber that has two connections is used as a Colpitts oscillator. The 50Ω tap is used to couple to the amplifier / feedback structure via a small value capacitor, which means this is only lightly loaded – so its Q remains high in circuit. All connections to the second resonator are grounded and the adjustment screw removed to stop it affecting the primary one. Now, how about adding varicaps to voltage tune it? The normal way to couple a varicap diode onto an LC resonator is to connect it in parallel with the tuning capacitor – but these resonators have no separate C. The varicap could have been capacitively coupled to the 50Ω tap, in parallel with the connection to the oscillator, but this just felt wrong. Varicaps are relatively low Q devices and connecting at this point would load the resonator and degrade the oscillator performance. The solution finally adopted was to connect the varicap in series with the port of the resonator that normally goes to ground. A high value of capacitance made up of fixed C in parallel with the varicap means the bottom end of the resonator is 'almost ground' and, by suitable choice of parallel fixed capacitor and varicap type, a suitable voltage tuning range could be achieved. The centre frequency could be set in the range 427 – 440MHz and tuning sensitivity, using the BB149 diodes finally chosen, ended up at 600kHz/V. Anything from 100kHz/V to 1.5MHz/V could be selected by appropriate choice of diode and parallel capacitor. The figure finally chosen proved sufficient to cover mechanical shock and natural drift with temperature. The frequency spectrum of the VCO in free running mode (converted down to 28MHz using a 432MHz low-noise receive converter) can be seen in **Figure 3**. The plot resolution (noise bandwidth) is 12Hz and it can be seen that at 20kHz spacing from the carrier the phase noise is about 100dB down on the carrier in this bandwidth; after normalising to 1Hz, the phase noise density at this spacing lies at about 110dBc/Hz. Take a look at the extreme levels of supply decoupling used on the supply to the VCO, with capacitive bypassing and series chokes to block every foreseeable spurious nasty from getting in. Such extremes are essential if a clean output is needed and it's not as if the additional components are even expensive. Their values aren't even that critical, so a well stocked junk box or a supply of PCBs for dismantling will usually yield something suitable.

ANOTHER GREMLIN. One always creeps in. Allan, GM3VXI was particularly interested in the high voltage opto coupled FET isolator shown in Figure 3 of June's Short Circuits, but could find no reference to the LM1501 shown. A typo was to blame: the correct device is actually LH1501, but Allan then pointed out that this is a normally closed (NC) opto-switch. The normally open (NO) version is the LH1500. There are, in fact, a whole family of these Vishay devices; the LH1502, for example has one NO and one NC switch. Other devices have different voltage and current ratings. Take a look at the Farnell website **[5]** to see the range on offer.

WEBSEARCH

[1] SDR-IQ and driver software: www.moetronix.com/
[2] Reverse DDS project: http://myweb.tiscali.co.uk/g4nns/RevDDS.html
[3] RF Solutions GPS: www.rfsolutions.co.uk/acatalog/Surface_Mount_GPS_Module.html
[4] Toko helical filters: www.bec.co.uk
[5] Farnell components and data: www.farnell.co.uk

Your first QSO and working HF

Sue and Alec talk new amateurs through their first foray on the air

A 'crib sheet' can help you make your first QSO.

STARTING OUT. You've just got your callsign, the antenna is up and the rig plugged in. Now for your first solo QSO. Sounds easy but for lots of new amateurs pushing the PTT button on the mic suddenly becomes the hardest thing on earth! Here are a few tips we have found useful.

1: Write down an outline QSO and your station details as a crib sheet. For example, <Their call: My call: My Name: QTH: Signal report: Their call: My Call>. It helps to refer to it when your mouth will not work and your brain fails to help!
2: Listen on your chosen band for someone calling CQ or a Special Event station and jot down their callsign and a signal report.
3: Take courage in both hands, push the PTT and give out your callsign.
4: Do not be afraid to tell the other amateur it is your first contact. Many are happy to send a QSL card to mark your achievement and also help you. Unfortunately, very occasionally, if you do not get something quite right, you may from a very small minority get moaned at rather than helped. If this happens wish the person 73 and move on, because there are many more people who *are* willing to help and encourage. All amateurs get things wrong at some time, even the moaners!

SPREADING YOUR WINGS. So, you have now managed to do some QSOs on your own. Perhaps you have worked everyone on your Foundation course, or worked around Britain, so now for something a little further away.

Often you may hear stations calling CQ DX. What is DX? Everyone's idea of DX is different but generally it would mean outside of your own country. A DX contact is very different from an ordinary QSO; usually just a quick exchange of reports, then the calling station will move on and continue to work other stations. Occasionally, you may call a station who will not work you as you are not 'DX' to him! Just move on to someone who does remember when they started and almost everyone was DX.

PILE UP. With uncommon callsigns or rare countries there can be quite a crowd of amateurs around the globe all trying to work the station, so do not be put off if you can not get through first time. Keep trying and listen to what the DX station is saying. They may work stations in number order ie callsigns with a 1 in then 2 etc. They may also say they are working split or say something like working up, or down. In this case you will need to listen to them on one frequency but you speak to them on another a few kHz up or down. To find the frequency to talk to them on, if they have not said where it is, listen to find the frequency that other people are calling them on and try there. You may not always get through, especially if they are a long way away and you are only using 10W; remember they may well be running 1kW+!

Different times of the day will have different propagation. Waiting until fewer people are calling may give you a better chance of working the station. Most DX stations will try to listen for you if they know there are low powered stations or new licensees trying to work them. You should be able to work all of the UK and well into Europe, further if the conditions are good. If you have a good antenna and live on a hill, you can expect to work even further!

SELECTIVE. As you build up your number of QSOs you may want to work a particular callsign or country. By using the propagation reports and forecasts in the magazine you will be able to get an idea of which band and time would be best. Do not be put off if you can not work places like Japan, Australia and America – it may take a while of experimenting with antennas and a fair amount of luck to work into these countries with low power but it's not impossible. If you can hear the station then try working them!

COLLECTING QSLS. Having worked all these stations you may want to collect QSL cards. Many Special Event stations and DXpeditions have special cards. Some stations periodically announce where to QSL to; it may be via an individual amateur's call, direct or through the bureau. A good place to look if you are unsure is www.qrz.com or other callsign lookup sites.

One of quickest way to receive cards is to QSL direct but do not forget the SAE and return postage, often an International Reply Coupon or 'green stamp' (dollar bill(s)). This can be quite expensive so many amateurs use the RSGB QSL bureau. Look on the RSGB website for full details on how to use the bureau. QSLing via the bureau can mean a longer wait for cards. If you are required to QSL via an individual amateur's callsign do not forget to put the original callsign on your card and then clearly mark it VIA the required individual callsign.

Another way to QSL is via the internet using such sites as www.eqsl.cc or www.lotw.com. You can then print out any cards you want and can have your card within minutes of your contact! Start Here has a good description of this service on page 67.

Remember, *if you don't try a station you are certainly not going to work them!*

SSB is not the mode for everyone but there are, for example, a variety of data modes, satellites, SSTV and not forgetting CW that can also be very rewarding waiting for you to try. Do not forget there are many awards you can gain to mark your achievements. Good luck and enjoy your QSOs.

If you choose to QSL you may soon amass quite a number of cards!

The *EXCALIBUR*™ unsheathed.

- 9 kHz to 49.995 MHz frequency range
- Direct sampling, digital down-conversion
- 16-bit 100 MSPS A/D converter
- 50 MHz-wide, real-time spectrum analyzer
- 2 MHz recording and processing bandwidth
- Three parallel demodulator channels
- Waterfall display functions
- Audio spectrum analyzer
- Audio and IF recording and playback
- Recording with pre-buffering
- EIBI, HFCC and user databases
- Very high IP3 (+31 dBm)
- Excellent sensitivity (0.35 µV SSB)
- Excellent dynamic range (107 dB)
- Selectable medium-wave filter
- USB 2.0 interface
- Easy to install and use
- Very affordable

Receive three stations simultaneously, record with 2 MHz bandwidth, see the entire shortwave spectrum live - all of this at the same time. Which other receiver can do that? For more details, see:

www.winradio.com

WiNRADiO® by RADIXON®: Great receivers ahead of their time.℠

Antennas

The Windom off-centre fed dipole

PHOTO 1: M0CVO HW-40HP off-centre-fed dipole antenna.

THE DIPOLE. The centre-fed dipole is the most fundamental of all antennas. It is the most popular antenna used by amateurs worldwide, largely because it is very simple to construct and is an effective performer. A centre-fed dipole can be any electrical length as long as it is configured in a symmetrical fashion with two equal length sides. However, in its simplest form, it is made half a wavelength long at the operating frequency because such an arrangement is easiest to feed. The current and voltage distribution on a half wave antenna is shown in **Figure 1**, with high current and low voltage in the centre. Impedance is a ratio of current and voltage, which indicates a low impedance at the centre; a suitable point to feed the antenna using low impedance 50Ω feeder.

At the ends of the antenna, the voltages are high and the current low so the impedances at these points are high. Note that the current and voltage ratios either side of the centre feed point are mirror images of each other and such an antenna is said to be balanced. Ideally, the dipole antenna should be fed with twin wire feeder where the RF power in each conductor of the transmission line is equal, thereby cancelling radiation or interference pickup on the line.

In previous Antennas, I have discussed the pros and cons of a balanced feed and balanced antennas **[1]**, noting that it is probable that the strictly balanced feeder arrangements were derived from commercial practice. These commercial installations used multiple transmitters and antennas. Furthermore, the antennas were located some distance from the transmitters and any unbalance on the feeders resulted in radiation loss and cross-talk to nearby feeders.

OFF-CENTRE-FED ANTENNAS. The half wave dipole is just fine for a single band but if used on higher frequencies the feed impedances can vary dramatically. However, if the feed point is moved part of the way from the centre of the dipole the feed impedance can be increased to any impedance; a 300Ω point is shown in Figure 1. It also has some implications for multibanding the dipole. The current distribution diagram shown in **Figure 2** is based on one by DJ2KY. It shows the current on a half-wave length of wire on 80m superimposed on the current distribution on other higher bands. It can be seen that the current amplitudes on some of the bands coincide at sixth of a wavelength from the end, described by DJ2KY as a 'Windom point' **[2]**.

The current distributions shown in Figure 2 are idealistic, showing the current distributions in free space. In practice, these currents can have slightly different amplitudes and phases due to the proximity of the ground. Furthermore, amplitudes of the current variations along the antenna element may not be constant on the higher frequencies when the antenna is fed off centre. Nevertheless, the impedances found at the sixth of a wavelength point are fairly close together on some bands.

Most off-centre-fed dipole (OCFD) antennas appear to be fed with coaxial cable (**Figure 3**). The currents on the centre core of coax cable (I_1) and the inside of the shield (I_2) are equal and opposite. The two conductors are closely coupled along their entire length, so the equal and antiphase current relationship is strongly enforced. This I_1/I_2 relationship is completely independent of the coax environment. The cable can be taped to a tower or buried, yet the equal and opposite nature of I_1 and I_2 inside the cable remain the same.

Enter the 'skin effect' **[3]**, which causes HF currents to flow only (very) close to the surfaces of conductors. This causes the inner and outer surfaces of the coaxial shield behave as two entirely independent conductors. When a coaxial feed is used, the unbalanced nature of an OCFD antenna causes a difference between the currents flowing either side of the feed point. This difference current is shown in Figure 3 as I_3, and is equal to (I_1-I_2). Current I_3 has to flow somewhere. It cannot flow down the inside of the cable because I_1 and I_2 must be equal, so instead it flows down the outside of the outer sheath. As a result, the feed line becomes part of the radiating antenna **[4]**.

A COMMERCIAL OCFD. There are many commercial OCFD antennas on the market and the M0CVO HW-40HP antenna, shown in **Photo 1**, is one of them **[5]**. The centre consists of a plastic balun box with a SO239 input socket and screws with wing nuts for connection to the dipole elements. Strain relief and a support point are provided by three metal key rings attached through holes in the flange at the top of the box. The insulators at the other ends of the elements are of a very decent, heavy duty type. The antenna is supplied fully assembled as shown in Photo 1. Overall, it is 21.28m (66ft) long and described as an off centre fed dipole designed to operate on the 40m (7MHz), 20m (14MHz), 15m (21MHz) and 10m (28MHz) bands. The documentation with this antenna goes on to say, "Having a feed point 1/3 of the way along instead of halfway gives an impedance of between 300 and 400Ω… a 4:1 current balun is added at the feed point to alter the impedance to something closer to the required 50Ω. This then allows the antenna to be fed using standard 50Ω coaxial cable such as RG8 or RG213".

The balun was tested and found to have a transformer action of 4:1 as claimed. It was not possible to determine if the balun was a current (as claimed) or voltage transformer because the unit was sealed. The antenna

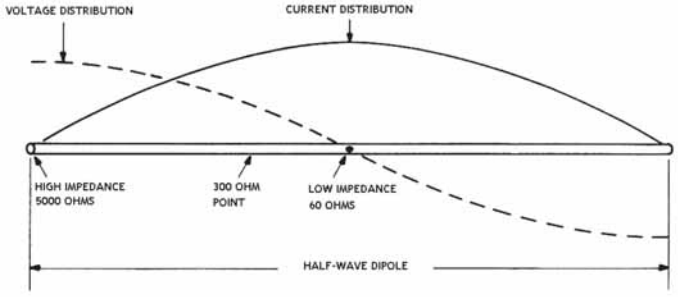


FIGURE 1: Voltage, current and impedance distribution on a half wave dipole.

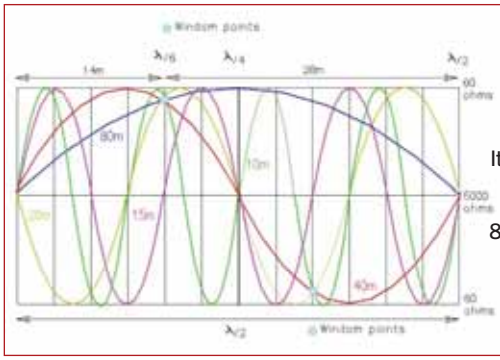


FIGURE 2: The current distribution diagram based on one by DJ2KY. It shows the current on a half-wave length of wire on 80m superimposed on the current distribution on other higher bands.

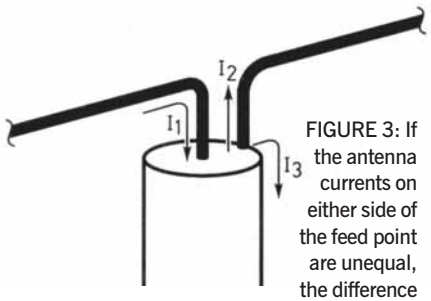


FIGURE 3: If the antenna currents on either side of the feed point are unequal, the difference $I_3 = I_1 - I_2$ will flow down the outside of the cable.

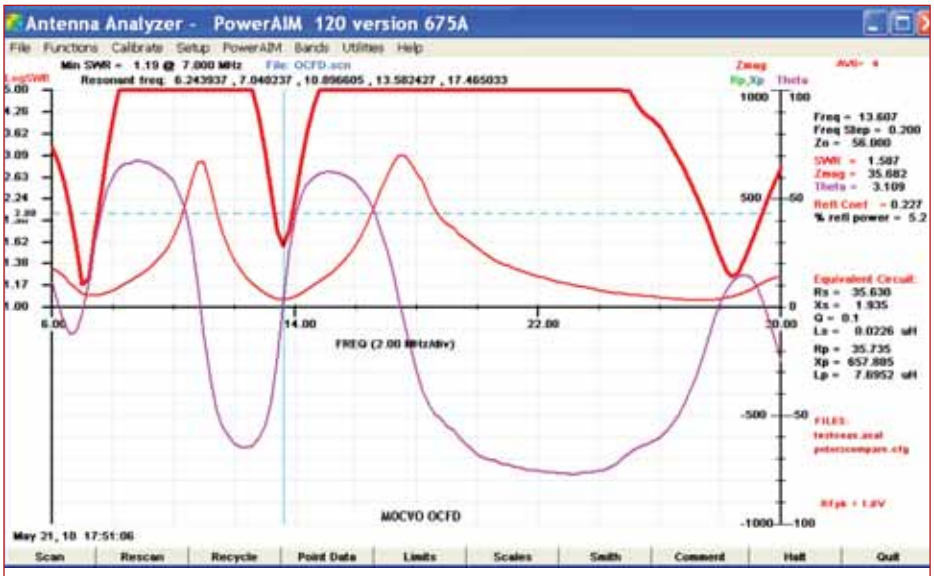


FIGURE 4: Impedance and SWR measurements of the M0CVO HW-40HP antenna, measured using the AIM 4170.

was fixed 10m high at one end and 7m high at the other, with the long element at the high end. (I had previously used this location for a 7MHz dipole during 501kHz/7MHz cross-band tests with VO1NA).

The results of impedance and SWR measurements, measured using the AIM 4170 via a 9m calibrated length of RG58, are shown in **Figure 4**. SWR is indicated with the thick red graph. Impedances Zmag and Theta are represented by the thin red and purple lines respectively. I noticed that the SWR on 7MHz varied when I touched the coax PL259 connector, indicating the presence of I_3 currents on the outer braid of the coax. Lowest SWR readings were obtained when the coax was laid on the ground. The antenna was then connected via a 25m length of coax to the shack and an MFJ-854 RF current meter was used to measure I_3 currents. With 100W of 7.02MHz RF fed to the antenna, the RF current I_3 at the bottom of the vertical section of coax to the antenna was 500mA. I measured 300mA at the shack end of the coax. These currents were less on the higher frequency bands. In spite of these currents on the outside of the coax no adverse affects such as RF in the shack, TV or audio equipment interference were experienced.

In general, the antenna performed reasonably well. Eastern USA and EU contacts were made on 7MHz without any difficulty. The antenna could be fed without an ATU on the 7, 14 and 28MHz bands (as you might expect from looking at Figure 4), in spite of the resonances being rather low in frequency. The antenna certainly would not load directly on 21MHz as claimed but this band and all the others could be loaded easily using an ATU.

Bearing in mind the asymmetrical nature of the feed, currents on the outside of the coax are inevitable. Some method of controlling them is necessary. Some OCFD builders go to a lot of trouble to eliminate common mode currents from the feed line. The arrangement shown in **Figure 5 [6]** is a multiband OCFD, which uses a 4:1 transformer plus two additional current chokes on the coax. Additionally the coax braid is connected to earth. All these precautions minimise radiation from the feeder on transmit, particularly important if one is using high power. It also reduces interference pick up on receive. I managed to reduce the current on the M0CVO antenna to 120mA in the shack by using a single W2DU current choke.

Overall, I was reasonably impressed with this antenna, although I wonder whether the metal rings would eventually wear through the flange of the plastic balun box.

THE CAROLINA WINDOM. Other antenna designs use the feeder radiation to advantage, a method described by G2HCG as 'Controlled Feeder Radiation' **[7]**. With this method, a current choke is placed some distance from the feed point so that the length of the radiating section of the feeder is preset. A commercial application of this is used with an OCFD known as the Carolina Windom. This antenna is also fed approximately 1/3 from the end using 50Ω coax and the feeder is encouraged to radiate due to the asymmetrical feed point. The physical length over which the feeder radiates is limited to 3m (10ft) by a 'line isolator', presumably a coax outer braid current choke. Radio Works who manufacture this antenna **[8]** have coined a title for the radiating section of feeder and called it VERT (Vertically Enhanced Radiation Technique). Several versions of the Carolina Windom are marketed by Radio Works.

It occurred to me that the M0CVO HW-40HP antenna could be converted to a Carolina Windom simply by adding a current choke 3m (10ft) down from the balun at the antenna feed point. While this reduced the common mode currents considerably, it had an adverse effect on the SWR – to such a degree that the ATU was necessary for all the bands. I don't know why this should be; suffice it to say there is more to the OCFD than meets the eye.

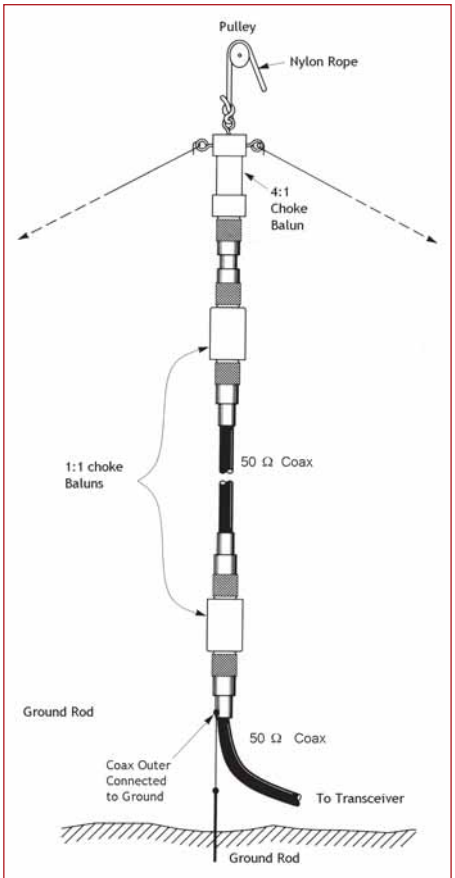


FIGURE 5: The feed system of a multiband OCFD, showing a method for eliminating antenna (I_3) currents.

REFERENCES AND NOTES

[1] 'Antennas', *RadCom* January 2006 & March 2006.
[2] The original Windom antenna, popular in the 1940s, comprised a wire element fed by a single wire 'feeder' approximately 1/3 from the end. Such a configuration had to be fed against ground similar to an inverted L antenna.
[3] http://en.wikipedia.org/wiki/Skin_effect
[4] The equal and opposite currents I_1 and I_2 are often referred to as differential mode currents. I_3 currents are often referred to as common mode currents; in some literature they are also referred to as antenna currents presumably because they cause radiation.
[5] m0cvoantennas.co.uk
[6] From How to Design Off-Center-Fed Multiband Antennas Using That Invisible Transformer In The Sky, Frank Witt, AI1H, *The ARRL Antenna Compendium, Volume 3*.
[7] Controlled Feeder Radiation, B Sykes, G2HCG, *Radio Communication* May 1990.
[8] www.radioworks.com

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
The World's Favourite Ham Store

Outline House, 73 Guildford Street,
Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

New Icom Models!

ICOM

New! ID-E880E
D-Star Mobile, D-Star as standard
£439.95

The E880 has been improved with a larger LCD display and a high speed scan capability of up to 50 channels a second.

New! IC-V80E
2m Handie 5W simple to use
Only £119.00

New! IC-E80D
D-Star Handie, 500kHz-1GHz RX built in **£369.95**

The IC-E80D handheld is capable of providing GPS position reporting functions in DV mode by utilising the optional HM-189GPS and has wideband receiver coverage with 5W output power on both VHF and UHF band.

New! IC-T70E
2/70 Dual band handie 5W, compact
Only £179.00

Icom HF Products

IC-718	Basic HF Radio, 12V, 100W output	**£459.74**
IC-7200	Mr T's choice for tough HF/6M Operation	**£775.95**
IC-7000	Full DSP, TFT Screen, 100W HF/6m + 2/70	**£1099.95**
IC-7600	100W, Twin RX, Huge Display. No psu	**LAST FEW AT OLD PRICE £3149.95**
IC-7700	Superb 200W HF/6M Base, PSU/ATU	**New RRP £5499.95 ML&S ONLY £5395**
IC-7800	Icom's Flagship radio has gone up again	**New RRP £7995.95 £Call!!**
IC-PW1Euro	1kW Fully automatic HF/6m Linear Amp	**£Call!!**

Icom Receivers

IC-R9500RF Flagship Base Receiver, 50kHz-3335MHz
Totally as new re-furbished model available Mint, boxed etc **Only £6995**

Icom V/U Products

IC-E92ED	As above c/w D-Star fitted & splash–proof	**£379.95**
ID-E880	NEW! Latest D-Star Dual-Bander. Now in stock	**£439.95**
IC-E2820	Proper dual band, dual display, remote etc	**£425.95**
IC-E2820+D	Supplied with UT-123 D-Star board	**£589.95**
IC-910H	Multimode 2/70 Base Station	**£1269.95**
IC-910X	As above but with optional 23cm UX-910	**£1469.95**

Icom PC Controlled Receivers

Icom IC-R1500 & IC-PCR2500
All Windows XP, Vista or Windows 7 Controlled via USB

IC-R1500	10kHz-3300MHz All Mode with remote head	**£449.95**
IC-R2500	Identical to the above but with twin independent speakers	**£589.95**

NEW Icom IC-9100 All-Rounder HF through to 23cms Base Transceiver

Click on our website to see a video from Tokyo Hamfair August 2009!

GB7ML
D-Star repeater is back on air!
See: 439.4625MHz
Default reflector 13.B

V/UHF Satellite + HF/50MHz bands + D-STAR DV mode

ICOM **IC-7600** **£CALL TODAY**

Have a rig to part exchange? Ring the ML&S Sales team and get an instant part ex price. You could have the 7600 in your shack sooner than you think.

The successor to the IC-7565Pro111, the eagerly awaited new mid-range HF/6M Transceiver will try and set another bench mark like that of its predecessor.

KENWOOD

Kenwood HF Products

TS-480SAT	Remote head HF/6m 100W inc ATU Transceiver	**£749.95**
TS-480HX	200W version of above, no auto-ATU	**£849.95**
TS-2000E	100W HF/6/2m & 50W 70cms, with auto-ATU etc. FREE HS-5 HEADPHONES (while stocks last)	**£1499.95**
TS-2000X	As above but fitted with 10 Watts on 23cms (all mode)	**£1799.95**

Kenwood V/U Products

TH-F7E	The only 2/70 FM Handie with SSB/CW WB Receiver	**£229.95**
TM-V71E	First Class 2/70 FM Mobile with remote head	**£289.95**
TM-D710E	The only 2/70 FM Mobile/Base with APRS/TNC etc	**£429.95**
TM-D710E+AvMap	Bundle. Personal Navigator for GPS located APRS	**£Call!!**

New TS-590S HF/6m Transceiver

Full specifications and details will be issued by Kenwood prior to release.

For further information see our website: www.hamradio.co.uk

ML&S are the sole UK & Ireland distributor for Microbit.

MicroBit Remote Rig Interface

Imagine going on holiday but missing your HF system back home. Well no more! Using the RRC-1258 system all that is required is for you to take the head unit of say your IC-706 or TS-480 together with one half of the RRC-1258, plug into a LAN connection connected to the web and within seconds you are "ON AIR" as if you were sitting in your shack at home. (Minus the cat, TV and any other external interference!)

The previous model is still available.
Microbit-1258 mkI £349.95. Including Lead Set
Microbit-1258 mkII £399.95. Leads included
For more info see **www.hamradio.co.uk/rrc-1258.shtml**

A complete remote control system for Amateur radio
Using Microbit's advanced technology, full remote control of your rig is available today.

Latest version of the Remote Rig.
One version for ALL radio models.

Like the original RRC-1258, the MkII is sold in pairs, assembled and tested but not configured. Included in the package is one USB cable, Power cables (2 pc), Cat 5 cable for making IC-706 cable and a 2xRJ-45 extender.

Alinco DJ-G7E

2m/70cm/23cm Handie Transceiver. Simultaneous full duplex operation between any two bands. £299.95

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

Come and celebrate Martin's twentieth year in business at the forthcoming RSGB Convention starting Friday 8th to 10th October. Friday night in particular is the ML&S 20th Birthday Buffet – see RSGB for further details.

20 Celebrating years ML&S

YAESU

FT-817ND

After almost 9 years you would think there would be competition for the FT-817. Still the ONLY truly hand-portable 160m-70cm all mode transceiver available today.

£449.95

NEW! Yaesu FTdx5000D

ML&S were the **FIRST** to have a new FTdx5000D on demonstration in their main showroom (and still have) and were very happy to offer this exciting new bench-mark setting radio to Peter Hart for review in RadCom last month. It goes without saying that all three versions sold by ML&S will be Yaesu UK sourced and first stock is due to arrive August/September. 2010. ***See www.FTdx5000.com for more details.***

Yaesu FT-857D & ATAS-120A Package

Still our best selling HF Mobile Radio.

FT-857D only £589.95 or with ATAS-120A £819.95

By adding the remarkable ATAS-120A Auto Antenna you have 40-10M at the press of a button without getting out of your car! No other manufacturer has been able to offer this unique feature together with their mobile radio. Having used the ATAS on 40m I was amazed how a mobile antenna so small performs so effectively. My single band whips have been consigned to the garage ever since!

Yaesu FTM-350E

Latest Dual-Band APRS Mobile from Yaesu!

NOW AVAILABLE FROM STOCK!

£549.95

Yaesu FT-897D

The best multi-purpose multi-band transceiver on the market!

ML&S: £669.95

Yaesu FT-450 HF Base Transceiver with & without ATU. HF & 6m Full DSP

FT-450 shown with optional Bail Stand.

The Yaesu FT-450 is a major new HF & 6m transceiver offering full a 400MHz IF DSP design at a very low price. Available with or without internal ATU, this new rig offers serious performance for those who are not bothered about the upper V/U bands.

Yaesu FT-450 without ATU: £589.95
Yaesu FT-450AT with ATU: £679.95

Options:

MyDEL MP-8230 23Amp PSU	£69.95
Stand-FT450 Bail Stand	£19.95
ATU-450 Optional internal ATU	£163.43
MMB-90 Mobile Bracket	£19.36
MHG-1 Carry Handle	£10.17
MH-36E8J DTMF Mic	£71.48
MD-100 Desk Mic	£149.95
MD-200A8X Super Deluxe Desk Mic	£199.95
YH-77STA Headphones	£56.14
MLS-200 High Power weatherproof speaker	£28.55
ATAS-120A Fully Auto Mobile 7.50MHz Antenna	£239.95

Yaesu FT-2000 PEP

Performance, Excitement, Perfection!

The DX choice of 3B7C.

Always in stock. Always on demo. Two flavours, 100W or 200W, you choose.

FT-2000: £2099.95
FT-2000D: £2695.95

FT-2000 Accessories

Yaesu CABPC-YAESU-USB At last we have USB Cables for FT-450/950 & FT-2000. These can be used for programming and Control of these radio's (Note to Firmware update the FT-2000 you will also need the FT-2000-PROG-PLUG at £5.00 inc VAT) **£25.49**

Yaesu Com Port Control and Programming Kit This allows computer control of the Yaesu FT-2000/FT-950/FT-450 and the programming of firmware updates without removing the feet of the radio. **£25.54**

Yaesu FT-2000 Memory Stick This 1GB memory stick includes Yaesu control software and the latest (ver.133) firmware update..... **£24.95**

MyDEL 9-PD to USB The MyDEL 9-PD to USB is a 9-pin to USB cable which allows you to connect your Yaesu FT-2000 to your Windows XP computer for firmware upgrades. **£29.96**

Yaesu MD-100A8X The Yaesu MD-200A8X is a ultra high-fidelity desk top microphone..... **£204.30**

Yaesu MD-100A8X Yaesu MD-100A8X is a desk top microphone..... **£153.21**

Yaesu FH-2 The FH-2 is a Remote Control Keypad built for the FT-2000..... **£43.89**

Yaesu FT-2000 & FT-2000D Mini-Manual. Size, 4.5x8 inches. Twenty high-quality laminated pages, loaded with detailed instructions covering all aspects of using these superb HF rigs..... **£19.99**

Yaesu MTU-160 The MTU-160 is an external µ-tuning unit for the FT-2000 on the 160 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

Yaesu MTU-80/40 The MTU-80/40 is an external µ-tuning unit for the FT-2000 on the 80 and 40 meter band. This MTU unit requires the external µ-tuning base kit..... **£449.51**

Yaesu MTU-30/20 The MTU-30/20 is an external µ-tuning unit for the FT-2000 on the 30/20 meter band. This MTU unit requires the external µ-tuning base kit..... **£449.51**

Yaesu YF-122C 7-pole Collins CW Filter (500Hz/2Khz: -6db/-60db) for FT-817, FT-857, FT-897 and FT-2000..... **£118.48**

Yaesu YF-122CN 7-pole Collins Narrow CW Filter (300Hz/2Khz: -6db/-60db) for FT-857 and FT-2000..... **£129.71**

FT-950 HF Base Transceiver

Yaesu's "Midship Radio"
All FT-950s supplied by ML&S are latest PEP factory

Only £1129.95 Available from stock

FT-950 Accessories

CABPC-YAESU-USB
USB Cables for FT-450/950 & FT-2000..... **£25.49**

Yaesu FT-950 (Mini-Manual)..... **£16.99**

Yaesu Com Port Control and Programming Kit **£25.54**

DVS-6 Voice Memory Unit..... **£44.90**

MD-100A8X Desk top microphone..... **£153.21**

MD-200A8X Ultra high-fidelity desk top microphone.... **£204.30**

MTU-160 External µ-tuning unit for the FT-2000 on the 160 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

MTU-30/20 External µ-tuning unit for the FT-2000 on the 30/20 meter band. This MTU unit requires the external µ-tuning base kit. **£449.51**

FP-1030A 13.8 VDC at 25 amps continuous or 30 amps surge. Input is 234V and 50Hz Dual meters showing voltage and amperage are featured along with a RED LED for overload indication **£314.65**

FH-2 Remote Control Keypad built for the FT-2000..... **£43.89**

Quadra - VL-1000 1 kW, HF & 6M Solid State Linear Amplifier and PSU (VL1000 & VP1000)..... **£3,799.95**

SP-2000 Base station external speaker built for the FT-2000. ..... **£136.87**

YA-30 Broadband folded dipole antenna working between 1.5-30 Mhz, which comes with 30 meters of cable..... **£250.28**

Yaesu VX-8E

Latest 6/2/70 Handie with optional Bluetooth, APRS & GPS **£299.95**

Buy a Yaesu VX-8E, the FGPS-2 GPS & MH-74 Mic for only **£399.95**

New version VX-8DE with enhanced APRS **£399.95**

VX-8E Accessories

Nifty HT Desk Stand mkII
Convenient desk top holder..... **£35.76**

Maldol MMG-SM Minimag
Quality, stable, Maldol miniature magnetic mount. **£20.39**

Yaesu BH-1 Stereo Bluetooth Headset..... **£134.82**

Yaesu BH-2 Bluetooth Headset..... **£123.58**

Yaesu BU-1 Internal Bluetooth Unit..... **£82.71**

Yaesu CD-40 Charger Cradle for BH-1/BH-2..... **£10.17**

Yaesu CD-41 Rapid Charger Requires NC-86U..... **£17.32**

Yaesu CN-3 SMA to BNC Adaptor..... **£8.12**

Yaesu CSC-93 Soft Case..... **£15.28**

Yaesu CT-131 Microphone Adaptor Cable..... **£30.60**

Yaesu CT-134 Cloning Cable..... **£36.74**

Yaesu CT-136 GPS Antenna adapter for FGPS-2 ..... **£27.54**

Yaesu E-DC-5B DC Cable with Cigarette Plug..... **£29.58**

Yaesu E-DC-6 DC Cable for Handhelds..... **£7.10**

Yaesu FBA-39 Dry Cell Battery Case..... **£22.44**

Yaesu FEP-4 Earpiece for BH-1 Bluetooth Headset..... **£16.30**

Yaesu FGPS-2 GPS Unit Requires CT-136 or MH-74A7A **£71.48**

Yaesu FNB-101LI 7.4V 1100mAh Lithium Ion Battery.. **£45.94**

Yaesu FNB-102LI 7.4V 1800mAh Lithium Ion Battery.. **£61.26**

Yaesu MH-74A7A Waterproof Speaker Microphone **£43.89**

Yaesu NC-85U AC Charger for BH-1/BH-2..... **£22.44**

Yaesu NC-86U AC Charger for VX-8..... **£10.17**

Yaesu VX-8E (Mini-Manual) Sixteen high-quality laminated pages, loaded with detailed instructions. Ideal for setting-up and operating the VX-8R quad-band transceiver **£14.99**

Yaesu VX-3E. ML&S £138.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60R. ML&S £145.95
Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £199.95
Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £259.95
The UKs best selling Triple Band Handie.

FT-7900 New! Similar to FT-7800. **£249.95**

FT-1900 Replacement for the FT-1802. Rugged 50W 2m FM. **£129.95**

FT-7800 FREE CARRIAGE UK MAINLAND if quoting RadCom at time of order.

FT-270E Replacement for the VX-170 2M 5W Handie. **£109.95**

FT-2900 NEW! Replacement for FT-2800. MiL spec, high performance. **£139.95**

See Website for details of these new Yaesu mobiles

Yaesu FTM-10R. ML&S £269.95

Yaesu FT-8800. ML&S £295.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

Yaesu FT-8900. ML&S £329.95
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!

Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W) **Bundle Price: £CALL (Rig only: £669.95)**

Yaesu FT-857D The Ultimate HF Mobile Installation! Plus ATAS-120D 40m-70cm Auto Antenna
Bundle Price: £819.95 (Rig only: £589.95)

Yaesu FT-817ND Only £449.95
The world's only all-band portable transceiver.

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
The World's Favourite Ham Store

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

NISSEI — One of the oldest names in Ham Radio

Compact metal body Cross Needle Meters. Fantastic value all PEP & Average reading.

Nissei	RX-103	1.6-60MHz, 20/200/2kW	£49.95
Nissei	RX-203	1.8-200MHz, 2/20/200W	£49.95
Nissei	RX-403	125-525MHz, 2/20/200W	£49.95
Nissei	RX-503	1.8-525MHz, 2/20/200W	£69.95

New Range to ML&S, HUGE DISPLAY, PEP & Average reading.

Nissei	TX-102	1.6-200MHz, 2/20/200W	£59.95
Nissei	TX-402	125-525MHz, 2/20/200W	£59.95
Nissei	TX-101A	1.6-60MHz, 20/200/2kW	£84.95
Nissei	TX-502	1.6-525MHz, 2/20/200W	£89.95

DAIWA — Beautifully constructed. Benchmark performance.

Cross Needle SWR Power Meters

Daiwa	CN-801S	900MHz-2.5GHz, 2/20W	£99.95
Daiwa	CN-801VN	140-525MHz, 20/200W	£99.95
Daiwa	CN-801HP	1.8-200MHz, 20/200/2kW	£99.95
Daiwa	CN-101L	1.8-150MHz, 15/150/1.5kW	£89.95
Daiwa	CN-103LN	140-525MHz, 20/200W	£89.95

NEW Mini VNAPro Now with Bluetooth! Only £349.95

The new miniVNA PRO, the big brother of the well-known miniVNA, is an extraordinary and unique handheld vector network analyzer that makes available a multitude of new features and capabilities which are perfect for checking antennas and RF circuits for hams and commercial users. Together with your PC/Laptop, you can add to your laboratory the further advantages of having this first-class VNA instrument. This is the first world's wireless analyzer able of scanning and sending the data using an integrated Bluetooth module to a remote PC/Notebook up to 100 meters from the miniVNA PRO's location. This makes real-time antenna setup easy!

MiniVNA original still available (without Bluetooth): £259.95

MyDEL CG-3000 £289.95

CG-3000 shown with optional remote switch.

With 200W and 200 memory channels

● Tunable frequency: 1.8 - 30 Mhz with long wire antenna from 8 meters ● Input impendence: 50 ohms ● Input power: 10 - 200W PEP ● SWR: <2:1 ● Power supply voltage: 12V +/- 10% ● Current consumption: <0.8A ● Auto tuning time: Approx. 2 seconds (first time tuning) Less than 1 second (return to memory frequency) ● Memory channels: 200 ● Weight: 1.8 KG ● Size: 310 x 240 x 72mm (L - W - H)

NEW! Remote control for the CG-3000 and CG-5000. £39.95

CG-5000MkII £559.95

At last! 600W PEP High Speed Remote Tuner from MyDEL

● Tuneable frequency: 1.8 - 30Mhz with long wire antenna from 8 meters ● Input impendence: 45-55 ohms ● Input power: 10 - 600W PEP ● SWR: <2:1 ● Power supply voltage: DC 13.8V ● Current consumption: <1.5A ● Memory channels: 800 ● Auto tuning time: 0.5-6 seconds (first time tuning), less than 0.2 second (return to memory frequency) ● Weight: 3 Kg. ● Size: 385mm x 280mm x 110mm (L - W - H)

Palstar

New! Palstar Commander HF-2500 1.5kW Amplifier

Palstar are pleased to announce a new range of HF Linear Amplifiers built to the highest standard. We have started with the "Commander HF-2500" which is available from stock. The 2m & 6m versions will be available during early 2010. ML&S: £3499.95

AT-500 600W PEP Antenna Tuner	Special Price £349.95
NEW AT-Auto Now handles a massive 1500W	£1099.95
AT-1500DT 1500W Differential Antenna Tuner	£449.95
AT-2KP (2000W) Antenna Tuner	£459.95
NEW AT-2KD The AT-1500DT and the AT-1KP have been combined into a new 2Kw Tuner	£429.95
AT-4K (2.5kW) Antenna Tuner	£769.95
AT-5K (3.5kW) Antenna Tuner	£999.95
BT-1500A Balanced Antenna Tuner	£599.95
PM-2000AM Power/SWR Meter	£159.95
Palstar Dummy Loads	
DL-1500 (1.5KW)	£119.95
DL-2K (2kW)	£229.95
DL-5K (5kW)	£349.95
Palstar R30A Receiver	
Palstar R30A, fitted Collins filters for SSB & AM	£649.95
MW550P Active Preselector & ATU for AM & 160M reception	£259.95
SP30 Matching Desk Speaker	£69.95
AA30 Active Antenna Matcher 300kHz-30MHz	£109.95

Flex SDR Radio

Flex 5000A Ultimate, fitted Second Receiver & Internal Auto ATU	£3395.95
Flex 5000A Basic	£2495.95
Flex 3000	£1399.95
Flex 1500 New!	£549.95

Miracle Antenna

Miracle Antenna is back!

With some important Hot New products.

Introducing the New MMD Mixed Mode dipole.

The first and only electrically centre-fed mechanically end-fed dipole ever offered to the Ham Radio market, the MMD provides a host of benefits never available in an end-fed dipole.

** Tunes its main band with no tuner - tunes other bands with a regular tuner*
** Feedline not frequency-dependant - may be lengthened or shortened at will*
** Feedline currents and RF in shack eliminated without extra chokes or baluns*
** No tension required to support feedline - opens endless installation possibilities*
** Common-mode noise eliminated for the quietest receiver performance ever*
** Connector and 16-ft feedline included - ready to operate right out of the box*

MMD-17	17M MIXED MODE DIPOLE, + 5 BANDS WITH ATU	£89.95
MMD-20	20M MIXED MODE DIPOLE, OTHER BANDS WITH ATU	£89.95
MMD-30	30M MIXED MODE DIPOLE	£99.95
MMD-40	40M MIXED MODE DIPOLE	£99.95
Miracle Ducker iL	HF-70cm Mini ATU with BNC	£109.95
Miracle Ducker	HF-70cm with PL-259	£109.95
Miracle Antenna	HF-70cm fitted with telescopic	£109.95

WonderWand Antennas U.K. — The UK's favourite rig-mounted antenna system

NEW! WonderWand Widebander
1.8-460MHz with Monster 1.8M Whip! £119.95

NEW! WonderWand Mk4
7-432MHz antenna with 1.8m Whip £89.95

Wonder-TCP
40-10m Tuneable Counterpoise £59.95

HF Linear Amplifiers

Yaesu VL-1000 Quadra	£3799.95
Icom IC-PW1Euro	£3979.95
Ameritron ALH-811HXCE	£999.95
Linear Amp Ranger 572B	£1275.00
Linear Amp Challenger Mk1V	£2295.95

LDG — NEW SHIPMENT JUST ARRIVED!

LDG Auto Tuner Range

NEW AT-600pro	600W Auto ATU	£329.95
AT-100proII NEW	Desktop tuner covering all frequencies from 1.8-54 MHz	£199.95
AT-200pro	Designed for new generation of rigs	£214.95
AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ohms	£510.95
AT-897Plus	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!	£183.95
IT-100	New version of the AT-7000	£159.95
YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£173.95
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£122.95
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£143.95
Z-11ProII NEW	Portable compact & tunes 100mW to 125W	£159.95
RCA-14	4-way DC Breakout Box	£49.95
KT-100	Dedicated tuner for Kenwood radios	£173.95
RBA-1:1	Probably the best 1:1balun out there	£35.71
RBA 4:1	Probably the best 4:1 balun out there	£35.71
FT-Meter	Neat Analogue back-lit Meter for FT-897/857. S-meter, TX Pwr, ALC Etc	£45.95
NEW FTL- Meter	Jumbo version of the famous FT-Meter	£79.95

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

ML&S are pleased to announce their appointment as distributor for RF Space Inc SDR-IQ™ Software Defined Radio, Spectrum Analyzer and Panoramic Adapter. Now available from stock - £469.95

IF-2000
IF Interface board for the FT2k & FT-950. £219.95
See http://www.hamradio.co.uk/acatalog/RF_Space.html for more details. Both on DEMO at Chertsey.

Perseus VLF-LF-HF Receiver

PERSEUS is a VLF-LF-HF receiver based on an outstanding direct sampling digital architecture.

See Peter Hart's review in May 2010. "Currently my new No.1 in terms of close-in dynamic range"

ML&S are Sole Distributors for Perseus in the UK and Ireland NOW IN STOCK!

£699.95

PERSEUS = Pretty Excellent Receiver for Software-Eager Unperceivable Signals

It features a 14 bit 80 MS/s analog-to-digital converter, a high-performance FPGA-based digital down-converter and a high-speed 480 Mbit/s USB2.0 PC interface.

A COMPLETE SDR RECEIVER FOR SHORTWAVES The PERSEUS analog front-end has been carefully designed for the most demanding users and includes a 0-30 dB, 10 dB steps, attenuator, a ten bands preselection filters bank, and a high dynamic preamplifier with a top-class input third-order Intercept Point of more than 30 dBm. The resulting third-order dynamic range is more than 100 dB in SSB and more than 105 dB in CW. Believe us, there's no other so performant and complete shortwave SDR receiver in the market today. The PERSEUS receiver can be operated also in a wide band mode as a 10 KHz - 40 MHz spectrum analyzer with more than 100 dB dynamic range in a 10 KHz resolution bandwidth.

SOFTWARE FOR DEMANDING USERS Being a software defined radio, the PERSEUS receiver relies on software applications to carry out the demodulation process. Besides providing all the required software signal processing for the PC platforms, the PERSEUS software has a comfortable graphical interface, is simple to use and runs under Microsoft Windows 2000, XP and Vista. All the controls a listener is used to see on a radio are there, in the application main window. The interface to third party software is provided in several ways, by means of the Microtelecom Software Defined Radio Developer Kit, virtual audio ports and virtual communication ports.

HB-1A Ultra Compact 3 Band CW Transceiver

Offering up to 4 Watts output on 40/30/20M Bands, this tiny HF portable is powered by 8 x AA cells and is aimed at the serious QRP enthusiast and has performance similar to that of the Elecraft KX-1.

- 20 meters, 30 meters and 40 meter amateur bands.
- CW Transceive, SSB receive.
- Receiving from 5 MHz to 16MHz.
- Maximum transmission power of about 4 watts on external 12V.
- Weight 350Grams (approximate).
- Battery compartment to hold 8 rechargeable AA cells.
- Built-in auto function keys.
- DDS VFO with 20 frequency storage memory.
- Digital dial with LCD technology.
- Automatic keyer with the CQ programmable with your call.
- RIT 10 Hz, 100 Hz.
- Frequency conversion super- heterodyne receiver.
- Unit will operate with voltage supply from 8-14 VDC.
- Built in AGC function.

ML&S Price: £249.95.

Call or see website for further details.

BACK IN STOCK!

The SR2000A Frequency Monitor

ML&S: £2295.95

Combines a spectrum display unit and receiver in a single cabinet. Up to 40MHz display bandwidth may be selected and minimum 1kHz RBW. The embedded receiver provides continuous coverage from 25MHz to 3GHz in AM, FM & WFM modes. The FFT SEARCH function enables you to locate elusive transmissions FAST, a free PC package (from the AOR web site) further enriches operation. Video images can be displayed on the LCD (PAL + NTSC). The interconnections are incorporated "in the box" along with an internal speaker.

VENTUS WX-928-ULTIMATE

The NEW WX-928 really is the ULTIMATE in professional weather stations, offering the usual feature set of the WX-831 but uses a Anemometer with solar cells , Satellite Meteotime forecast over the next 4 days and a massive split screen.

Only £199.95

Description
This weather station is as called the ultimate weather station. It provides you with local weather data from anemometer, rain gauge and thermohygrometer sensor. All these local measurements from your garden can you save on your pc by using the pc-software included. Furthermore it receives a 4 days forecast by satellite from cities all around in Europe. Just find your city and the weather station updates automatically.

VENTUS WX-831

New much improved wireless Weather Station

ML&S Price: £119.95.

Options: Additional wireless temperature monitors: £24.95. PSU to run the WX-831 from 240V: £19.95

ONLY £49.95

VENTUS G730 GPS-LOGGER

This USB memory stick sized unit is a fascinating pocket device with multiple commercial and personal uses for individual movement tracking. It's very light, extremely easy to use and logs your route automatically. It also adds your GPS location to digital pictures. It presents the route you have taken in 3D via Google Earth™ on your PC and it can export in different formats.

Want to dabble in D-Star without the expense of a radio?

New Product!
DV-AP-Dongle

The DV Access Point Dongle, (DVAP for short) by Internet Labs, provides a way to connect to the international D-Star network. The DVAP is used with a PC/Mac and an Internet connection. Unlike the DV Dongle, the new product allows amateur radio operators to walk away from the computer and transmit/ receive D-Star voice and data using a two meter D-Star radio. Note that a D-Star radio is required to communicate with the DVAP and an Internet connection is required to communicate with the D-Star network. Due August 2010.

NEW

Price TBA. See web for more details.

DV-Dongle

The DV Dongle connects to your PC or Apple Mac via a USB port and provides encoding and decoding of compressed audio using the DVSI AMBE2000 full duplex vocoder DSP chip. AMBE technology is used in all D-Star radios to provide efficient voice transmissions. It is also used in some HF digital protocols by vendors like AOR. The DVTool application used with the DV Dongle may be installed and run on Microsoft Windows XP/Vista, Mac OS X Leopard, or many flavors of Linux.

In stock, works with MAC or PC. £199.95

Morse Keys at ML&S

Begali

For the entire range with choice of bases and contacts and prices please see our website or BEGALI on www.i2rtf.com

Begali Sculpture

Begali Signature

Begali Camel Back

Begali chose ML&S because they wanted a quality company to sell the very best Morse Keys in the World. ML&S are sole distributors for these beautifully crafted keys in the UK.

For full details see our website or send 40p in stamps for full colour catalogue.

Kent Morse Keys

The best British range of keys money can buy!

The Kent twin paddle Morse key. £84.95. Kent Single Paddle Key. £72.85. Kent KT-1 Professional. £79.90.

DX Engineering Products stocked at ML&S!

New! DXE-UT-8213 Coax Cable Stripper ONLY £45.99!

This tool prepares RG-8, RG-213, 9913F7, LMR-400 (not LMR-400UF) and other similar size coax cable for installation of a PL-259 connector - or DXE-N1001S two-piece Type N connector (requires a slight additional trimming of the cable center conductor length).

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
The World's Favourite Ham Store

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

New! GAP Antennas Available from stock

GAP ANTENNA PRODUCTS

Eagle-DX 6-Band, 40-10m 2kW .....Only £325.95
Titan-DX 8-Band, 80-10m 2kW .....Only £345.95
Voyager-DX 4-Band 160-20m, 2kW 45ft tall!.....£385.95
Challenger-DX 8-Band 80—2m (no 17).....£295.95

Alpha Delta Antennas

ALPHA DELTA COMMUNICATIONS, INC.

Alpha Delta are a USA Manufacturer of high quality coax switches, lightning (surge) protectors and the best wire antennas money can buy.

Delta-2B	2-way position SO-239 switch (1kW) for use up to 1.3GHz	£54.15
Delta-4B	4-way position SO-239 switch (2kW) for use up to 500MHz	£75.60
Delta-4BN	4-way position N-type switch (1.5kW) for use up to 1.2GHz	£86.80
AD-ATT3G50	0MHz to 3GHz (200W) surge protector. N-Female Connector	£49.95
AD-ATT3G50/HP	0MHz to 3GHz (2kW) surge protector. N-Female Connector.	£48.89
AD-ATT3G50U	0MHz to 500MHz (200W) surge protector. SO-239 Connector	£39.95
AD-ATT3G50U/HP	0MHz to 500MHz (2kW) surge protector. SO-239 Connector	£44.95
End Insulators	Dog Bones. They are extremely rugged, UV and RF resistant	£1.53
Delta-DX-A	160m, 80m and 40m 1/4 twin slope trap antenna. This antenna combines the tremendous DX firepower of the 1/4-wave slope with the wide bandwidth of the 1/2-wave dipole. One leg is 67ft long and the other is 55ft long	£79.95
Delta-DX-B	160m, 80m, 40m and 30m single slope trapped antenna. This antenna is designed for limited space installations, were room does not allow for large wire antennas; it only requires 60ft of space providing amazing DX performance at installation heights of 35ft	£84.96
Delta-DX-CC	80m, 40m, 20m, 15m and 10m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£136.90
Delta-DX-DD	80m and 40m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£89.95
Delta-DX-EE	40m, 20m, 15m, 10m dipole, it can be used on 30m, 17m, 12m with an ATU. This antenna is not trapped, and has an overall length of 40ft	£119.95
Delta-DX-LB	160m - 80m, and 40m Low Band dipole. This antenna performance and 2:1 VSWR bandwidth depends on the height and surrounding objects; overall length is 100ft.	£119.96
DX-LB-PLUS	160m, 80m, 40m and 20m - 10m Low Band dipole. This antenna performance and 2:1 VSWR bandwidth depends on the height and surrounding objects; overall length is 100ft.	£162.45
DX-Series	Full-size utilized monoband dipole. These dipoles are using the Delta-C Centre Insulator with built-in Arc-Purge Surge Suppressor. **DX-20:** 20m Monoband Dipole at 33ft long **DX-40:** 40m Monoband Dipole at 66ft long **DX-80:** 80m Monoband Dipole at 133ft long	£44.95
DX-Ultra	Medium wave to 30MHz 80ft AM Broadcast Dipole. Efficient, low-noise dipole for military, government, etc., use.	£119.95
Hardware Kit	contains the following: 1 x Dipole Centre 2 x Dog Bones 1 x Surge Protection Block	£27.95
Delta-SEP	Replacement/spare Arc-Plug™ Static Electricity Protector. This unit is usually attached to the back of the Alpha Delta Centre T Balun	£12.95

Super Antennas USA

Super Antenna ChapStick
MP-1 80m-10M Portable Antenna supplied complete with tripod & 80m coil.Only £159.955

Super Antenna MP-1 Rotary Dipole
10-80M with (Incl. 80m Coils) Collapses into a small carry bag. .....Only £299.95
Or Deluxe version with Tripod. £389.95

Super Antenna YP-3 "Beam in a Bag" 80-10M (inc WARC) 3 ele portable beam supplied with carry bag £399.95

The complete range of Super Antenna products and accessories can be found on our web site

Hustler Antennas

HUSTLER

Base Station Range
Free standing, max 7.3m tall, 1kW

4-BTV	40/20/15/10m	£178.95
5-BTV	80/40/20/15/10m	£218.95
6-BTV	80/40/30/20/15/10m	£245.95

17-BTV-S 17m add on for 5-BTV or 6-BTV **£53.95**

Mobile Range
200W or 1kW, both stocked. RM10 to RM-80
10M to 80m single-band whips.. **£24.95** to **£56.95**

The full mobile and base range and accessories available from stock, including the high power 1kW mobile range.

Yaesu Rotators

The best available at very special prices.

Only £299.95

G-450C The most popular medium duty rotator available today. ML&S always guarantee to have the largest stocks in the UK and of course the best prices. With 25m of cable.

G-250 Ideal simple to use remote control Antenna rotator for light weight antenna installations. Ideal use for turning 4/6/9 element Tonna 2m antennas, 9/19/21 element 70 cm antennas. Also V/U Log periodic (i.e. Maldol LP-1300) and small single and HF dipoles.....Only £109.95

G-550 Elevation rotator for satellite operation .....Only £259.95

G-5500 Heavy-Duty PC Controlled Vertical rotator for satellite and EME applications. .....Only £469.95

G-650 Medium duty with higher brake torque than the G-450. Supplied with 25m control cable.....£339.95

G-1000DXC This new, high-performance rotator is ideal for heavy-duty applications. Its slim-line constructions is ideal for many crank-up tower installations. Rotation range: 450°, with presets. £399.95

G-2800DXC Yaesu's top-of-the-line rotator is for extra-heavy-duty antenna installations. It includes Auto Slow Start and Auto Slow Stop features to avoid sharp jolts to the antenna array and tower. The G-2800A includes a mast clamp and 40 metres of control cable, to simplify installation. Total rotation range: 450°, with presets.....£769.95

For the full range of the worlds most reliable Yaesu Rotator products, see our website.

COMET

Comet SWR/Power Meter
CMX 2300 2 separate SWR/Power Meters in one box! .£153.21

Comet Antenna Tuner
CAT-300 300W Antenna Tuner £194.08

Comet Wide-Band Vertical
NEW! Comet CHA 250BKII
80m to 6m with no ATU and no gaps.....£299.95

Comet Rotary Dipole
H-422 4 Band trapped dipole £275.82

Comet HF/VHF/UHF Base Antennas

CWA1000	80,40,20,15,10 trapped dipole	£99.95
GP1	144/430 MHz 3.0 / 6.0dbi 1.25m	£59.95
GP3	144/430 MHz 4.5 / 7.2dbi 1.78m	£69.95
GP6	144/430 MHz 6.5 / 9.0dbi 3.07m	£99.95
GP9	144/430 MHz 8.5 / 11.9dbi 5.15m	£139.95
GP15N	50/144/430 MHz 3/6.2/8.6dbi 2.42m	£99.95
GP98	144/430/1200 MHz 2.94m long	£139.01

Comet Handy Antennas

BNC-750	BNC HF whip 7-50MHz TX/RX	£81.69
CH32	BNC 144/433/900Mhz 45mm	£20.39
CH-99	BNC Tel Whip 70-1000MHz 195-1135mm L	£20.38
CHF816	16 3.5/28/50MHz 74cmL 10W/Yaesu FT817	£51.03
RX5	144/430/900MHz 44cm L 8W SMA	£30.60
RX7	144/430/900MHz 44cm L 8W BNC	£30.60
SH95	144/430/1200MHz 37cm L 10W BNC	£30.60
SMA3	144/430/900MHz 25cm L 10W SMA	£25.50
SMA99	70-1000MHz 1.1mm max L Tele SMA	£17.32

Comet Duplexers

CF360A	28/50MHz w/leads SO239 - PL259/PL259	£40.82
CF416A	44/430MHz w/leads SO239 PL259/PL259	£35.71
CF416B	144/430MHz w/leads SO239 PL259/N male	£35.71
CF503C	50/144MHz Sockets SO239 - PL259/PL259	£45.93
CF530C	50/144MHz w/leads SO239 - PL259/PL259	£45.93
CF530A	50/430MHz w/lead PL259 SO239/SO239	£40.825
CF4160B	144/430MHz Sockets SO239 PL259/PL259	£33.66

Comet Triplexers

CFX431A	144/430/1200MHz N socket/PL259/N/N	£51.03
CFX514N	50/144/430/MHz SO239/PL259/PL259/N	£51.03

DIAMOND

Base Antennas

X-30	2/70, 3/5.5dB, 1.3m Long	£51.04
X-50N	2/70, 4.5/7.2dB, 1.7m Long	£66.37
X-300	2/70, 6.5/9dB, 3.1m Long	£102.12
X-7000	2/70/23, 8.3/11.7/13.7dB 5m Long	£204.30
V-2000	6/2/70, 2.15/6.2/8.4dB, 2.5m Long	£127.67

Mobile Antennas

NR-770R	100W, 2/70, 3/5.5dB, .98m Long	£35.71
NR-770RSP	As above but spring loaded	£40.82
NR-7900	2/70, 3.2/6.4dB, 1.46m Long	£51.04

Duplexers/Triplexers

MX-72N	1.6-150/400-460MHz Duplexer	£45.94
MX-62M	1.6-56/140-470MHz Duplexer	£69.44
MX-610	HF/6+2+70 (for FT-8900)	£73.52
MX-2000	6/2/70 Triplexer	£85.78
MX-3000N	2/70/23 Triplexer	£82.71

Switches

CX-210A	2-way, SO-239 Die Cast	£47.98
CX-210N	2-way, N-Type, Die Cast	£74.54
CX-310A	3-way, SO-239, Die Cast	£83.74
CX-310N	3-way, N-Type, Die Cast	£109.28

SWR/PWR Meters

SX-100	1.6-60 MHz, 30W-300W-3KW	£132.78
SX-200	1.8-200 MHz, 5-20-200 Watts	£91.91
SX-1000	1.8-1300 MHz, 5-20-200 Watts	£230.87
SX-40C	144-470MHz X needle Mobile Meter	£88.85
SX-20C	3.5-150MHz X needle Mobile Meter	£88.85
SX-27P	COMPACT 144/430, 60W Portable Meter	£45.93

Power Supply
GSV-3000 25Amp 5-15V Variable Metered.....£224.74

Huge selection of Diamond products always available ex-stock.

bhi

Great British designed and built products

DSPKR Price £154.95
New Desk Top "Noise Away" Price £154.95
NES10-2MKII DSP Noise cancelling speaker Price £99.95
NEIM1031MKII Price £139.95
ANEM "Noise Away" MKII Price £124.95
NEDSP1061-KBD Price £99.95
NEDSP1062-KBD Price £104.95
Radio Mate Compact Keypad Price £89.95
CAT-MATE Electronic "Y" splitter for Yaesu FT-817 FT-857 & FT-897 Price £49.95
1042 Switch Box £24.95

British Designed & British Built!

Two new Books from Nifty!

Nifty E-Z Guide to D-Star Operation
Using easy to understand explanations and illustrations, this book describes how the D-STAR system operates and provides guidance for setting up transceivers to be able to access D-STAR's many features and modes of operation. **Only £13.00**

Nifty E-Z Guide to PSK-31 Operation.
Using the very popular DigiPan software as a basis, a detailed step-by-step approach is used for configuring your interface hardware, software and computer system for PSK31 operation. Detailed step-by-step instructions and computer screen shots are provided for several Windows operating systems, including Vista. **Only £13.00**

Plus the full range of Nifty Equipment Manuals available from stock.
Equipment Manuals and Quick Reference Cards for Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios.

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

WE WANT YOUR USED EQUIPMENT!

Used equipment sitting at home gathering dust?
MAXIMUM PRICES PAID
For genuine good condition equipment

Call us now and get an instant quote to buy & collect from your home. Or send your list to: sales@MLandS.co.uk

ISOTRON!

The most compact 1kW HF Antenna ever!

After 30 years of manufacture and Hot from the USA, these very clever compact antennas are available for all the HF bands. They are easy, quick and simple to install. Tunes & performs without radials or antenna tuners.

Unlike other compact designs (that aren't actually that compact) Isotron even offer multi-band versions for 80/40 and 20/15/10m.

- Solve Virtually Any Restricted Space Problem - 40 Metre Isotron only 22 inches x 16 inches x 15 inches!
- Easy, Quick, and Simple Installation
- Tunes & Performs Without Radials or Antenna Tuners
- Handles Up to 1000 Watts PEP
- Durable Construction, Can be Used in Extreme Weather Conditions
- Excellent For Portable Operation - Emergencies, RV's, Field Day, Motels
- Multi-Band Operation on One Feedline with Back-to-Back Mounting & NO Loss of Performance
- Can be mounted in ANY Position Without Loss of Performance
- Maritime Operation - Uncluttered Setup, with Stainless-Steel Fasteners & Not Dependent Upon Grounding for Performance
- SO-239 Connector on All Models

Mark, G8AWO showing off the assembled 10/15/20 & 40/80m Combo Isotron's before mounting on the roof at ML&S HQ.

The full range can be viewed on our web-site and prices start from only £100 through to £200 for the "Combo's".

G3TXQ HEX BEAM 5-BAND DXE-HEXX-5ATP

The G3TXQ 5-band HEXXAGONAL BEAM built by DX Engineering is a directional antenna kit made with fibreglass spreaders and wire elements for the 20, 17, 15, 12 and 10 meter bands. It looks like a very large inverted umbrella frame. Even at 22 feet wide and approximately 5 feet tall, it has a smaller turning radius than a two element 20 meter Yagi, and offers several enhanced operating characteristics.

The DX Engineering HEXX antenna can offer gain and front-to-back performance that exceeds your expectations for a 2 element beam, as its unique shape is much smaller, better balanced and has been reported to receive less noise than typical beams. This lighter, easier to handle antenna can be rotated with a light duty rotator, and it performs well, even when it is not mounted very high above the ground.

DX ENGINEERING

In stock, £599.95
more details see our website.

MyDEL CG SB-2000 USB Radio Interface

A one stop solution to your data and radio control. It employs a CAT/CIV interface as standard and supports CAT with RS232 protocol.

The MyDEL CG SB-2000 Interface connects to your PC via USB and Sound Card and connects to your radio via Custom leads. Once connected and configured you have Computer Control via USB and decoding via your soundcard using HamRadio Deluxe or other packages.

High quality ready-made leads for most rigs available at only £18.95.

Only £99.95

From only £99.95
Call to discuss your rig-to-cable requirements.

IN STOCK!

Tigertronics SL-USB

ALL sound card Digital and voice modes are supported by the SignaLinkTM USB. This includes traditional modes such as RTTY, SSTV and CW (to name a few), as well as today's hottest new modes like PSK31, MT-63 and EchoLink.

MyDEL POWER SUPPLIES

The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8 Volts at up to 120 Amps.

New Nissei PS-30SW11

Latest high performance switch mode PSU.
Die-cast Alloy chassis, full over-voltage protection and short circuit design.
RRP £119.95.
ML&S only £84.95

2 Year Warranty!

MP-925. £99.95
Linear PSU (Not Switch mode) 25-30Amps, 13.8V DC Variable, Metered with low current terminals for accessories. DC power supply.

SPS-8250. £79.95
25A continuous, fully metered power supply, switch mode.

2 Year Warranty!

MP-6A. £29.95
13.8V DC, 6A power supply.
Ideal for FT-817ND or most handhelds.

MP-8230 As used by CDXC. £69.95
13.8V DC, 25A power supply, switch mode.
Best Seller!

2 Year Warranty!

2 Year Warranty!

MP-9626. £299.95
"The Brick"
120A, 13.8V DC power supply, switch mode.

MP-9600. £179.95
60A switch mode power supply.
Ideal for TS-480HX or other 200W output radio.

2 Year Warranty!

Only £99.95

Only £169.95

Alinco DM-330MW PSU

The Alinco DM-330MW is a 30 AMP switch mode power supply. It is ideal for mobile/portable with its light weight and low noise.

Yaesu FP-1030A Linear PSU

25-30Amp 13.8V fixed DC PSU, Twin meters, near silent running.
2 year Warranty

MFJ Products from your favourite UK Dealer

MFJ-16010	Random Wire ATU 160-10M	£69.95
MFJ-949E	Manual ATU metered, Dummy Load, 1.8-30MHz, 300W	£179.95
MFJ-901B	Manual Mini ATU 1.8-30MHz 200W	£109.95
MFJ-971	Manual ATU metered, 1.8-30MHz 200W	£118.95
MFJ-904H	Manual ATU, metered, inc balanced, 1.8-30MHz 150W	£149.95
MFJ-969	Manual Roller ATU Metered 1.8-54MHz 300W	£209.95
MFJ-993B	Auto ATU Metered 1.8-30MHz, 300W	£249.95
MFJ-1786X	Magnetic Loop 10-30MHz 150W	£429.95
MFJ-1788X	Magnetic Loop 7-22MHz 150W	£469.95
MFJ-259B	Antenna Analyser 1.8-170MHz	£259.95
MFJ-269B	Antenna Analyser 1.8-450MHz	£349.95
MFJ-260C	Dummy Load 300W SO-239	£44.95

Lots more MFJ stocked!
See web for details

The World's Biggest Selling Virtual Radar System
Now includes built-in Airband & FM!

SBS-1eR Pocket Radar

£479.99

The ONLY Virtual Radar system available with Built-in AirBand receiver & Ethernet connectivity.

British Designed & British Built!

See web site for full specifications

See www.hamradio.co.uk for more details on all of these items ... and much, much more! E&OE

IOTA

Get ready for the IOTA Contest

QTH of CK8G on Greens Island.

John Boudreau, VE8EV outside the CK8G shack.

IOTA CONTEST. You may be reading this column close to the 2010 IOTA Contest (1200UTC on Saturday 24 July to 1200UTC on Sunday 25 July). This is not only a great opportunity to work some new IOTAs but if the other stations send their logs in you will be able to claim those credits from the database instead of having to send off for a QSL card. For the latest info on contest DXpeditions please check www.rsgbiota.org and click on the 'Activations' tab at the top, or consult the 425 DX News bulletins at www.425dxn.org.

Activations already notified to the IOTA website in early June include VK4LDX/P from Magnetic Island (OC-171). He will be using 100 watts into verticals for 40, 20, 15 and 10 metres SSB as a Single Operator All Band Low Power 24-hour entry. He hopes to set up early on Saturday to operate from 0000UTC using PSK on 20 and 15 and will QSY to the ANZA DX Net (0515UTC on 14183kHz) and after that should be back to 20 and 15m PSK until around 1100UTC. Check his website vk4ldx.blogspot.com for the latest information. QSL via home call.

Battle Island (NA-044) off the southern coast of Labrador will also be available around the contest time as W3HQ and KI4IW plan to be active as VO2/W3HQ on CW and SSB from 23 to 26 July. This group has only been worked by about 25% of active IOTA chasers. Battle is one of the former Marconi trans-Atlantic radio sites but little remains today. See www.battleharbour.com for more information on this historic location.

A German group including DF6QV, DJ2VO and DL9DAN will be QRV from the Westman Islands (EU-071) off the south coast of Iceland from 18 to 27 July as TF/home call. During the IOTA contest they will use the call TF7X. The Westman Islands are an interesting tourist destination but are a long way north and too far into the auroral zone to be a really good contest location. Few European stations turn their beams that way during the contest and it can be quite hard for TF stations to break pile-ups for new multipliers. The G6UW group from Cambridge University was QRV during the IOTA Contest a few years ago and struggled to make just a few hundred QSOs.

ARCTIC DXPEDITIONING. Last time I promised more information about the exciting VE8 trip to Greens Island in April. John Boudreau, VE8EV, has now posted details on his website at http://ve8ev.blogspot.com for those who want the full story. In brief this was a very well executed 1 week operation from a remote island 9 miles from the community of Paulatuk in the North West Territories. John was unable to rent a snowmobile for the week as nobody had a spare one they would part with so he was ferried out over the ice by a local guide – along with a 3.5kW generator, tower, operating tent and beam. As he remarks on his site, the generator made all the difference, allowing him to run a 1.5kW heater, 500W linear, and even a coffee machine! In a week of activity he made about 4900 QSOs including 4500 unique callsigns.

Not content with this achievement John was also QRV during a work visit to Sachs Harbour on Banks Island (NA-129). This time though the aurora was waiting for him and without a beam and linear he only managed a handful of QSOs.

OTHER NEWS. Gerard, F2JD, is back in Manila (OC-042), for at least six months and will be active as DU1/G0SHN on all bands and modes. He hopes to activate some of the rarer IOTA groups while in the country. QSL via F6AJA.

John, 9M6XRO and former *RadCom* editor Steve, 9M6DXX are planning a 4-day DXpedition to Sebatik Island (OC-295) in September. This group was activated for the first and only time back in July 2006 (9M4SEB), and remains high up the IOTA Most Wanted list with only 14% of active participants having worked it.

A Japanese group plans to be active from the DXCC entity of Wallis and Futuna from 14 to 24 July. They will spend most of their time on Wallis (OC-054) but plan a very short side-trip to the much rarer Futuna Island (OC-118) from late on the 15th to early on the 17th July. Futuna has only been worked by about 22% of participants whereas 66% have worked Wallis. Calls will be FW5M (QSL via JA2NQG), FWD2A (QSL via JH2BNL) and FW5FM (QSL via JI2UAY). They will sign /P when they are on Futuna. The FWD2A call may be changed on arrival as the group suspects a typographical error was made in the licence.

RIGS ON LOAN. The Chiltern DX Club (CDXC) has three DXpedition radio sets available for loan to RSGB and CDXC members. They come in a waterproof Peli case containing a Yaesu FT-450AT, MyDel switch mode PSU, Vibroplex iambic paddles, and Heil headset and footswitch. There is a further radio, a Yaesu FT-900, located in Kuala Lumpur, West Malaysia. This has been used several times to activate the Malaysian IOTAs. The equipment has been sponsored by CDXC, Martin Lynch & Sons, G3NUG, RSGB IOTA Committee, Vibroplex and Yaesu UK. See www.cdxc.org for more information and the terms and conditions for borrowing these sets.

EMC

Hot news of Ofcom's PLT Study

PHOTO 1: RF testing of a UK 13 amp double mains socket on a network analyser.

OFCOM PLT STUDY. Ofcom has commissioned a study on Powerline Telecommunication Devices (PLT) operating between 2 and 32MHz plus new devices operating up to 300MHz. The purpose of the study was to estimate the likelihood and extent of radio interference to various radio services over the next ten years. Before the Radiocommunications Agency (RA) became part of Ofcom, the RA had its own Radio Technology and Compatibility Group (RTCG) at Whyteleafe in Surrey who would have been well placed to do such a study. Since Ofcom closed RTCG, Ofcom uses external companies and organisations. In this case, Ofcom has used PA Consulting Group whose 156 page report is on the Ofcom website (see Websearch).

The PA Consulting report acknowledges input from various people and organisations including UPA (Universal Powerline Association) and the Homeplug Powerline Alliance together with PLT device vendors including Comtrend, DS2, Intellon (recently changed to Atheros), Gigle and BT Vision. Input from so-called 'victim' receiver groups is also acknowledged. These are (in alphabetical order): BBC, Civil Aviation Authority (CAA), EMC Industries Association (EMCIA), MCA (Maritime & Coastguard Agency), MoD (Ministry of Defence), RSGB and UKQRM.

The Executive Summary of the report states, "Our results show that users of sensitive radio systems may increasingly suffer interference from PLT devices. In this study we have taken a statistical approach to quantifying the probability of interference occurring as PLT devices become more commonplace. We have concluded that if uptake increases in line with our market forecasts, there will be a high probability of interference to some existing spectrum users at both HF and VHF by 2020 if PLT device features do not change from those currently implemented.

"However, within this timescale, in addition to the existing practice of notching International Amateur Radio Union (IARU) bands, interference mitigation features such as power control and smart notching are expected to have been implemented in PLT devices. Our results indicate that the introduction of these features will be enough to reduce interference to negligible levels in the majority of these cases. The exception to this is the safety critical aeronautical bands which we recommend are notched by default rather than by smart notching."

The key questions to ask Ofcom are what they intend to do next, whether they accept the report's recommendations, whether they intend to publish a response and whether they will consult on any response. There are also questions about the effectiveness of the mitigation measures which PA recommend and whether these go anywhere near to meeting the essential requirements of the EMC Directive.

The PA Report acknowledges that some devices already have notches in the amateur bands, but it fails to note that although these notches take the signal down just below the EN55022/CISPR22 levels, these devices emit far in excess of the standard's levels outside the amateur bands. It could be argued that this indicates non-compliance with the essential requirements of the EMC Directive, but the report does not comment on this.

The report addresses probability of interference and recommends ways to reduce this probability. That doesn't mean preventing interference, just reducing the number of radio users who suffer interference to a level that some might regard as negligible. The report makes no recommendation about what (if any) regulatory means should be used to cope with interference cases that do occur. Other significant points are:

- The report assumes that dynamic power control and 'smart notching' will be as effective as PLT manufacturers claim but this assumption has not been tested as devices using these techniques are not yet on the market.
- The report also assumes that the gain of UK mains wiring as an antenna at HF and VHF is –30dBi with a variation of ±5 to ±10 dB. It can be shown that this is optimistic for the UK, particularly at VHF.
- The report states that notching of VHF amateur bands by PLT devices is required in addition to the existing notches of the HF amateur bands. No devices currently on the market have VHF notches, however and the report doesn't say how deep the notches should be. The only interference analysis relevant to VHF amateur operation is for narrow band FM operation but this is based on a path loss equation that assumes an antenna gain of 0dBi. There is no analysis of SSB and CW operation in VHF amateur bands using antennas with gain but it can be shown that interference would be worse in such cases and would require PLT devices to implement deep notches to avoid interference.

The report is based on a detailed study of published literature together with simulation using a radio interference modelling tool, *Seamcat*, developed by the European Radiocommunications Office (ERO). There are also some laboratory tests but these are subjective tests rather than repeatable tests using standard EMC test equipment and test sites.

Predicting the gain of house wiring as an antenna is crucial to HF and VHF link margin calculations. On this subject, the PA report cites a NATO report and a report from Communications Research Centre Canada. As the PA report is specifically about the UK, it should concentrate on data applicable to UK mains wiring rather than averaging this with data applicable to other countries such as Germany and Canada. The NATO report cites five references and some of these

relate to German wiring practice, which is significantly different from UK. In the UK, each house normally has a single phase supply with neutral and earth joined together where the supply enters the house. This introduces a source of RF unbalance that is not found in other countries. Two of the five references in the NATO report, 55 and 60, refer to UK wiring practice. Reference 59 uses a gain of –20dBi and reference 60 is a conference paper published by myself and Prof. Y. Sun in 1999. This also shows typical antenna gains higher than –30dBi for UK house wiring at HF so the figure of –30dBi that the PA report uses appears to be too low for UK house wiring.

Section 10.1.1 of the PA Report considers the antenna gain for household wiring at VHF. In the absence of any existing measurements of radiated emissions from PLT devices above 30MHz, the authors assume that the PLT antenna gain at VHF will be same as it is claimed to be at HF, ie –30dBi with a variation of ±5dB to ±10dB due to variations in the wiring. This gain figure is rather important because it is used in all the VHF link margin calculations in the PA report. Is this figure likely to be achieved in practice? Let's find out.

VHF PLT RADIATED EMISSION TESTS.

The RSGB EMC Committee has some EMC test results from a type of PLT device that uses frequencies up to 300MHz for mains-borne communication. The device in question is a type mentioned in the PA report that uses spectrum up to 300MHz. The PA report also states that the transmit power of this particular chipset is –80dBm/Hz above 30MHz compared to –50dBm/Hz below 30MHz. This reduced transmit power above 30MHz is said to have been selected with the aim of ensuring that the radiated emissions from PLT devices using this chipset fall below the CISPR guidelines and are fully EMC compliant. Someone seems to have redefined CISPR EMC 'limits' as 'guidelines'.

First, let's look at how much power this device transmits and what field strength we would expect. The figure of –80dBm/Hz is a power spectral density (PSD) that equates to 10 picowatts measured in 1Hz bandwidth. To find the power of this broadband signal in any other bandwidth, we need to multiply the PSD by the measurement bandwidth in hertz. Radiated EMC measurements above 30MHz use a measurement bandwidth of 120kHz so the power in that bandwidth is 1.2 microwatts. It can be shown that if all that power is radiated by an antenna with a gain of 0dBi (ie an isotropic antenna) then the field strength at a distance of 10m would be 767 microvolts per metre or 57.7dB(μV/m). This is 27.7dB above the EN55022 Class 'B' Quasi-Peak (QP) radiated emission limit of 30dB(μV/m) from 30–230MHz. So if the PLT device is connected to mains wiring with an antenna gain of lower than –27.7dBi, then in theory, it should pass the EN55022 radiated EMC test. So what happens in practice?

We had a pair of such devices tested by a reputable EMC test laboratory. Radiated emission tests were performed with horizontal and vertical polarisation and the result for vertical polarisation is shown in **Figure 1**. The vertical units are dB relative to 1μV/m. The measurement distance is 3m but the limits in the standard are at 10m so the red limit line has been scaled by 10dB. This test follows the test industry convention of doing a quick scan with a peak detector that does not directly relate to the Standard's limits and then going back and making the time-consuming Quasi-peak (QP) measurements of the individual highest peaks identified by the peak scan. This particular product fails the QP limit by 12–14dB at some frequencies. The QP results are approximately 3dB lower than the peak measurement shown in Figure 1. This implies that the gain of the mains supply to the equipment under test on the EMC test site is significantly higher than –28dBi over a wide range of frequencies and is up to –14dBi at some frequencies. To get this product to pass the EN55022 Class 'B' radiated limit up to 300MHz, it appears to need carefully engineered and therefore unrealistic mains supply wiring that is well-balanced right up to VHF. The EN55022 standard does not define the characteristics of the mains supply to the equipment under test at VHF so there is nothing to stop anyone from doing this in order to pass the test.

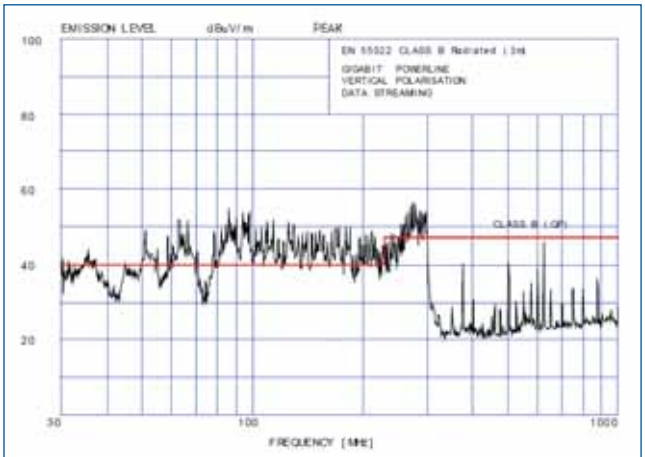


FIGURE 1: Radiated emissions from a PLT device that uses VHF frequencies up to 300MHz.

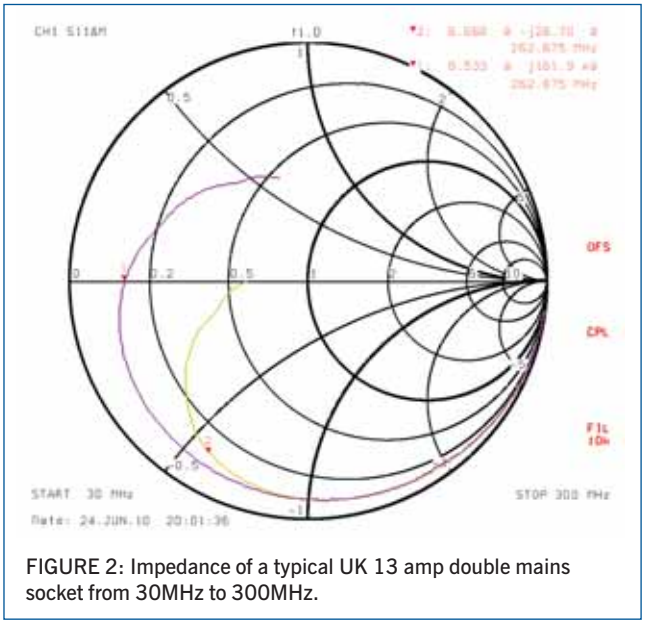


FIGURE 2: Impedance of a typical UK 13 amp double mains socket from 30MHz to 300MHz.

Based on the above data for a short length of mains supply wiring close to a ground plane on an EMC test site, the antenna gain figure at VHF that PA have used appears to be somewhat optimistic. Further work is required to see what it is in practice for actual UK house wiring, especially upstairs wiring. Before the RF signals from a PLT device even get to mains wiring, they have to pass through a mains socket. Are these well balanced at VHF? It's time to find out.

IMPEDANCE OF MAINS SOCKETS AT VHF.

UK 13 amp mains sockets are of course designed to operate at a frequency of 50Hz, not up to 300MHz. I tested two typical types of double switched UK 13 amp mains sockets on a network analyser (see **Photo 1**). The results for one socket made by MK are shown in **Figure 2**. On the Smith Chart, Marker 1 shows that the impedance between Phase and Earth at 262.875MHz is almost purely resistive at 6.5Ω. Marker 2 shows that the impedance between Neutral and Earth is 6.06 –j27Ω so it has a magnitude of 29.3Ω. That means it is rather unbalanced.

Another type of double mains socket tested had a resonance at 299MHz where the impedance between Phase and Earth went down to only 3.5Ω but the impedance between Neutral and Earth was 56Ω.

If something as simple as a double switched UK mains socket can introduce substantial unbalance at VHF, then keeping the antenna gain of the wiring down to –30dBi ±10 dB across the whole band seems unlikely.

WEBSEARCH

Ofcom Report *The Likelihood and Extent of Radio Frequency Interference from In-Home PLT Devices*, www.ofcom.org.uk/research/technology/research/emer_tech/PLT

Cross Country Wireless SDR

How good is this ready-built 30/40m SDR?

PHOTO 1: The CCW 40/30m receiver comes ready built in a smart ABS case.

DESCRIPTION. This new software defined radio (SDR) receiver from Cross Country Wireless (CCW) **[1]** is a one- or two-band fixed centre frequency unit for users who want a basic low cost entry to SDR techniques. Using direct downconversion (mixing) from HF to baseband in two parallel quadrature channels, the resulting signal (extending from near DC to several kHz) is amplified inside the SDR and fed to the left and right channel line inputs of a PC sound card. Digital signal processing (DSP) software running on the PC digitises the audio, filters and performs a further frequency conversion or demodulation to give audio that is reproduced through the PC speakers.

The CCW SDR offers a choice of two internal crystal oscillators or an external VFO. It has a combined low-pass high-pass filter in the RF path feeding the mixers and is described as being "optimised for use with any stereo input sound card so you won't need to buy an expensive sound card to use it".

The radio is available in several variants. There are single-band 30- and 80m-only versions, or the dual band 30/40m type reviewed here that has receive centre frequencies of 7.055MHz and 10.125MHz. The 80m version has centre frequencies of 3.580 and 3.668MHz, while the 30m one has a narrower front end band pass filter and centre frequencies of 10.125 and 10.140MHz. Using a 48kHz sound card, SDR software can tune ±22kHz from these values. The unit is compatible with SDR software designed for Softrock receivers (*Rocky, PowerSDR, WinRad, M0KGK SDR, CW Skimmer, SDR-Radio*) and is supplied ready built and tested at a price of £49.95 + £7.00 international postage. Units may be ordered using PayPal in any local currency, although prices are shown are in UK £. The operating manual can be downloaded as a PDF file from [1].

Housed in an ABS plastic case of 150 x 112 x 35mm and operating from 7-20V DC at 60mA, the receiver claims a minimum detectable signal of better than 127dBm using a 48kHz 16 bit stereo sound card with *Rocky Signal 3.6* SDR software.

FIRST IMPRESSIONS. The 40/30m unit reviewed here was a pre-production model and arrived bubble-wrapped with no manual or connecting cables. The plain ABS case has BNC and DC connectors for RF and power, a captive 1.3 metre long twin screened audio cable terminated in a 3.5mm stereo jack plug for the PC soundcard line input. **Photo 1** shows a slightly later production version of the receiver, which additionally has a power-on LED.

A power lead was made up with a suitable connector and the radio powered from a 12V benchtop PSU. Current consumption measured as 60mA – agreeing with the specification.

The frequency band has to be selected by opening the case and changing a jumper. The top is easily removed just by pulling it off – there are no screws to remove. The innards can be seen in **Photo 2**. The jumpers to change the frequency (labelled X1 and X2) are at the middle left just above the bottom left IC.

SOFTWARE. For a simple SDR like this, the software running on the PC is all-important. No software was supplied with the CCR SDR, although the manual suggested *Rocky*. I generally use *WinRad* (Version 1.32), a very simple and intuitive package that can be downloaded from **[2]**.

Users are advised to download and try several different SDR software packages to see which they prefer. All are free of charge and usually straightforward to install on most PCs. Use a search engine to find suitable download sites.

PERFORMANCE TESTS. The flying audio lead was plugged directly into the 3.5mm jack at the rear of a three year old Dell Desktop running Windows XP. The 7MHz band jumper was selected and RF input was supplied from a Rhode and Schwarz signal generator. The *WinRad* software was set up for 48kHz sample rate and SSB mode was selected. The signal generator was set to 7.058MHz and the *WinRad* software tuned to this value.

Minimum detectable signal, by ear, was only -116dBm, rather worse than the specification value of -127dBm. In order

PHOTO 2: Internal view of the production CCW SDR receiver.

for the signal to be visible on the *WinRad* waterfall display -109dBm was needed, although selecting a narrower frequency resolution would no doubt change this value. Aural reception is a bit subjective, but this result does suggest there is a 10dB lack in sensitivity over that given in the specification. Input overload level was determined by monitoring the audio output from the receiver on an oscilloscope while increasing the RF input power level until the trace showed compression. Visible overload (flattening of the output sine waveform) began at -30dBm where the audio output level was of the order of 6V peak to peak. This is a higher level than most sound cards can cope with, typically 3V pk-pk (1V RMS). An RF input of -40dBm gave an output of 1.2V pk-pk. The manual provides details of how to reduce the output level by adding two resistors and – out of the blue – CCW supplied a modification kit with instructions free of charge during the review period.

A feature of I/Q direct conversion is the opposite sideband rejection. With -70dBm input at 7058kHz, the wanted tone was read off as -47dB on the screen readout. The corresponding leakage tone the opposite side of the centre line was measured as 85dB, suggesting a sideband rejection of 38dB – an acceptable value for this type of receiver. At 7062kHz, sideband rejection was lower, at 22dB, suggesting perhaps some imbalance between I and Q channels in the audio filtering.

Unlike *WinRad*, *Rocky 3.6* allows for automatic adjustment of I/Q balance in order to improve sideband rejection. After a bit of persuasion I downloaded and tested this package. It's true, there is an automatic I/Q balance option and this produced, on average, some 7 – 10dB improvement in sideband rejection. Not a great improvement, but will lead to noticeably lower unwanted responses.

Returning to WinRad, the receiver was next connected to an antenna. The resulting *WinRad* display is shown in **Figure 1**. Note the bright line in the centre, which is caused by hum, noise and spurious breakthrough of computer-generated interference that gets injected into the audio path. It consists mostly of 50Hz harmonic components and is a feature of many low cost SDR packages. It means that the RF band is often unusable for a couple of hundred Hz either side of the centre frequency. Several signals can be seen, and the CW 'sounded fine'. PSK31 waveforms all decoded well when the audio was fed into the Digipan decoding software. SSB signals could be tuned easily using mouse clicks or the mouse thumbwheel.

Sideband rejection at 10130kHz was 24dB. At 10140kHz the value reduced to 19dB rejection and was 17dB at 10135kHz. In practice this will mean that when operating at the upper audio ranges (well away from the centre line), strong signals from one end of the 10MHz band will end up tuning in as if they were at the opposite end, with a reversed spectrum. PSK31 and other data may end up mixed with CW.

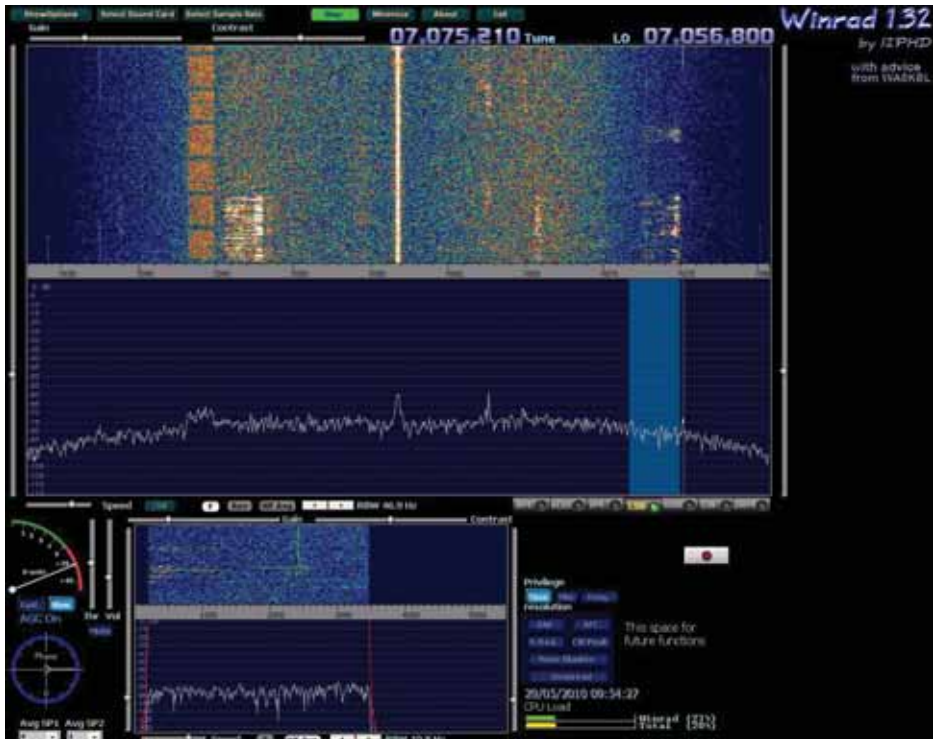


FIGURE 1: WinRad screen of the CCW receiver on the 7MHz band.

EXTERNAL VFO CONNECTION. Two jumper pins are provided for an external VFO input, which is active when neither of the internal oscillator outputs is connected. I supplied an external LO from another signal generator and an attempt was made to receive the upper end of the 7MHz band signals by supplying an LO at 28.6MHz. The manufacturer stated that a CMOS drive level was required, so a suitable buffer was made up using a 74AC00 device. However, the result was not satisfactory. A horrible comb of spurii could be seen on the display even with no RF input.

The reason for this is that the internal crystal oscillators are not disabled when their selection jumpers are moved. Both run at all times, with only the RF being routed to the mixers, but with all signals passing through a single hex-inverter IC. An external VFO input suffers leakage from the other two oscillators. The spectrum of the signal(s) present at the input to the 4066 mixer device in the range 0 – 150MHz can be seen in **Figure 2**. Redesign with a different input arrangement might make for more reliable external local oscillator use.

OVERALL IMPRESSIONS. This receiver is clearly positioned at the low to mid end of the SDR market and is in direct competition with the Softrock Lite kit and several similar web-published and homebrew designs. Being supplied complete and ready made will make it appeal to those unwilling or unable to construct a kit or roll their own. The £50-ish price tag appears quite reasonable. But compared with the Softrock, performance is lacking. The linearity and compression figures are lower and sideband rejection at 10MHz poor, a result that almost certainly can be attributed directly to the use of CMOS HC4066 gates in the mixer rather than the far superior signal handling and matching of the FST31xx bus switch family. These are universally used in all recent HF direct conversion projects and were first described in considerable depth by Pat Hawker in Technical Topics well over a decade ago.

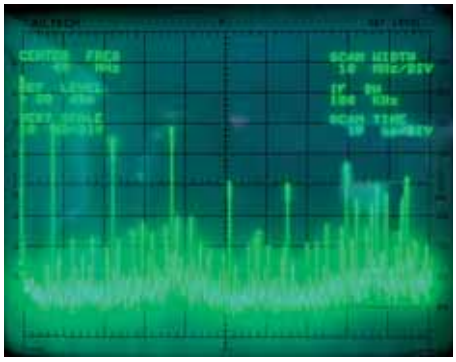


FIGURE 2: Spectrum of the LO signal at the 4066 mixer when supplied with an external VFO input at 28.6MHz.

However, the receiver does work adequately with off the shelf software to allow almost plug-and-play reception of most of the 10MHz band and a substantial part of 7MHz.

WEBSEARCH

[1] Cross Country Wireless: www.crosscountrywireless.net/sdr_receiver.htm
[2] *Winrad* SDR Software: www.winrad.org

LF

Who needs aerials when you can just use earths?

VE7BDQ's 136/500kHz transmitter using four 6146s. A good way to keep warm next winter!

VLF STAKE OUT. Good weather at last and the LF experimenters have been out in force. Roger, G3XBM has applied for an NOV for sub 9kHz experiments but, partly due to some concerns from the Met Office regarding interference to lightning detectors and other meteorological equipment, this may take some time. In the meantime Roger and a few other UK experimenters have been getting a feel for VLF by trying some 'earth current signalling'. This is an idea that was first used in battlefield communications where audio signals were applied across a pair of widely spaced earth stakes and picked up at a distance of a mile or so by a sensitive receiver connected to another pair of earth stakes. That was base-band audio and very easy to do, but better sensitivity is obtainable by modulating the information onto a carrier and using a selective receiver to separate it from the inevitable noise. Most people have created their 'earth base' by using the house earth as one end and running a single thick wire to an earth stake as far away from the house as possible. This technique will certainly work over a few km at ULF (Roger has achieved 5.1km with 838Hz CW) but experiments to see if an earth-loop signal will actually propagate into the far field have been going on too.

Stefan, DK7FC recently spent a happy day in a forest, constructing a 300m earth base using multiple earth stakes at each end to bring the resistance down. So far he hasn't got much beyond 5km but the signals were good at this distance so they may be propagating further – it's just that there was nobody there to receive them! Others have achieved this sort of distance too, but with ground loops it's always hard to know whether the transmission is being aided by underground pipes and cables. Stefan's experiment was out in some unspoilt countryside where this should have been less of a factor.

His next VLF tests will be with the kite aerial that he used on previous 'dreamers band' experiments but this time he has special permission to fly his kite at 300m. Using the same coil he estimates the resonant frequency of the system will fall to about 6.3kHz and he may try some experiments at that frequency. He may also try modifying the coil to get back to 8.97kHz, which should produce a 10dB better signal than last time. That should give some very interesting results.

A great exponent of the earth loop transmission principle was the late G0AKN who did many experiments using earth bases as aerials on 136kHz and other frequencies. He wrote up all his results as a website and this has been preserved by G0KZZ at www.aerthgroup.org.uk. It makes very interesting reading.

John had some good results on 136kHz using this method, I recall hearing his signals on several occasions from portable locations around the country. At the time he had access to the now-defunct 73kHz band which was probably a better candidate for this kind of work. A few experiments have been undertaken recently on 136 and even 500kHz using earth base 'aerials'. G3XBM used his 20m earth base on 500kHz with only 5W of WSPR and had reports from several stations including G0KTN who is about 130 miles away.

A useful characteristic of this kind of aerial is that it can be quite quiet on receive. Tony, EI8JK has been testing an 80m wire to an earth stake on 500kHz and reports a 6 S-point reduction in sky-wave noise. Switching from his G5RV to the earth-base enabled him to copy PA0A with a good signal-to-noise figure when he was not copyable on the G5RV. He reckons it doesn't have much advantage during the day though.

FIRST DREAMERS BAND QSO. On 4 June, DL2LF and DF6NM had a successful 2-way contact on 8.97kHz over a distance of 20.2km, well outside the 'near field' zone. They were using small back garden inverted L aerials with poor efficiency (no 300m high kites!). Both used 100W car stereo amplifiers and were each able to achieve an EMRP of about 5μW. *Spectrum Lab* software was used on receive and information was passed by using a frequency offset as an acknowledgement. QRN was quite high as it usually is in the summer, and the noise blanker in *Spectrum Lab* was used to improve copy.

VEs AND ZLs GET GOING. Although some Canadians have had special permission to experiment on 136kHz it has only recently been opened up for all. So far I have had reports that VE7BDQ, VE7SL, VE7TIL, VA5LF and VA7JX are preparing their stations and that many others are to follow. It should be an interesting winter season if they all come on!

Meanwhile on 500kHz the ZLs are getting good results. It's early days yet but they have already crossed the Tasman Sea and received reports from VK2AWD and VK1SV.

NEW LF-FRIENDLY ROS MODES. The latest version of the ROS digital software mentioned last time incorporates two new modes with 98Hz bandwidth. This makes them more suitable for use in the restricted space available on 136 and 500kHz bands and complies with some countries' 100Hz maximum bandwidth restriction. The modes are ROS7 MF, which runs at 128 characters per minute and ROS1 MF, which should have a 10dB advantage but runs at a slower 21 characters per minute.

Gary, G4WGT has devised an interesting way of using ROS and similar modes with push-pull Class D transmitters that need a 272kHz drive signal. He uses a linear transverter to produce the 136kHz ROS signal from an HF SSB exciter. This 136kHz signal is then frequency doubled with a buffer amp and tuned circuit, clipped and fed to the divider chip of the Class D PA. His first on-air test of the system earned him a good daylight report from F5WK who is 410 miles away. Gary reckons it should work with WSPR too.

nevada radio®

For the BEST DEALS & Fastest Delivery!

Ecoflex®

New Ecoflex Low Loss Cables & Connectors at Nevada!

New range of cables & connectors at Nevada! Flexible with PE-LLC dielectric and gas content of over 70% for very low loss and use up to 6 GHz

Ecoflex 15

Specification
- Diameter: 14.6mm
- Loss per 100m: 2.81dB @ 100MHz, 1.96 dB @ 50MHz

Price: £5.60 per metre, **£532** per 100m drum

Ecoflex 15 Connectors
- **PL259** connector (Part: 7350) **£8.95**
- **N type** connector (Part: 7395) **£9.95**

Ecoflex 10

Specification
- Diameter: 10.2mm
- Loss per 100m: 4.0dB @ 100MHz, 2.8 dB @ 50 MHz

Price: £2.65 per mtr, **£251.75** per 100m drum

Ecoflex 10 Connectors
- **PL259** connector (part: 7378) **£5.95**
- **N type** connector (part: 7367) **£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

Aircell

Aircell range is a highly flexible coaxial cable for use up to 6 GHz. The low losses in relation to the diameter and the small bend radius of the cable make it perfect for the Radio Amateur.

Aircell 5

Specification
- Diameter: 5.0mm
- Loss per 100m: 9.4dB @ 100MHz, 6.61dB @ 50MHz

Price: £1.35 per mtr, **£128.25** per 100m drum

Aircell 5 Connectors
- **PL259** connector (part: 7760).....**£2.25**
- **N type** connector (part: 7700).....**£3.95**
- **BNC type** connector (part: 7720) ...**£3.25**

Aircell 7

Specification
- Diameter: 7.3mm
- Loss per 100m: 6.28dB @ 100MHz, 4.52dB @ 50MHz

Price: £1.70 per mtr, **£161.50** per 100m drum

Aircell 7 Connectors
- **PL259** connector (part: 7390).....**£2.65**
- **N type** connector (part: 7392).....**£5.25**
- **BNC type** connector (part: 7371) ...**£5.25**

Aircom Plus

Operating up to 10 GHz, this semi Air spaced cable has a massive oxygen free copper inner conductor covered with a thin film of PE to prevent corrosion permanently

Aircom Plus

Specification
- Diameter: 10.3mm
- Loss per 100m: 3.8dB @ 100MHz, 2.6 dB @ 50MHz **Price: £2.95** per metre

Aircom Plus Connectors
- **PL259** connector (part: 7378).....**£5.95**
- **N type** connector (part: 7367).....**£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

Nevada Low loss cables - 100m Drums

Westflex 103...Semi Air-spaced.....**£130.00**
RG213U .....Mil Spec low loss ..**£119.00**
RG213TM .....Economy low loss....**£99.00**
Mini RG8.....**£69.00**
RG58U .....Mil Spec.....**£39.95**
WF-165..75Ohm double screened..**£129.00**
450 Ohm Twin feeder.....**£85.00**
300 Ohm Twin Feeder.....**£75.00**

PALSTAR

QUALITY POWER SUPPLIES

New shipment just arrived save 10% this month ONLY!

PS-04 4A 13.8V supply ~~£24.94~~ **£22.46**

PS-06 6A 13.8V supply ~~£29.95~~ **£26.96**

PS-15 15 Amp 13.8V DC supply ~~£59.95~~ **£53.96**

PS-30M 30A variable Voltage ~~£99.95~~ **£89.96**

PS-50 40A linear bench supply ~~£159.95~~ **£143.96**

SPA-8230 23A 13.8V switch mode ~~£59.95~~ **£53.96**

SPS-9600 60A switch mode ~~£179.95~~ **£161.96**

LDG Tuners

Popular Models NOW in STOCK!

AT-100 Pro ...160 - 6m) 125W.....£189.95
AT-200 Pro ...(160 - 6m) 250W.....£209.95
AT-897 Plus..for Yaesu FT897 Plus....£179.95
AT-1000 Pro .(160 - 6m) 1kW.....£499.95
IT-100.....for Icom IC-7000.....£209.95
YT100.....for Yaesu radios 125W .£199.95
Z-11 Pro2 .....(160 – 6m)125W.....£159.95
Z-817.....QRP for FT817 & others.....£119.95
FTL .....Meter for FT857, FT897 .£79.95

Daiwa Meters

801HP SWR Power Meter

Japanese high quality, huge twin needle display reading Average power, Peak power and SWR

- Freq: 1.8 - 200MHz
- Power: 20/200/2KW
- Connectors: SO239

SPECIAL PRICE ~~£129~~ £99.00

CN801VN..140-520MHz (N type Sockets)..£119.95
CN101L.....1.8-150 MHz .....~~£99~~ £89.00
CN103LN .....140-525MHz £99.00
CN801S.....900-2.5GHz N types.....£119.95
CN801V .....140-520MHz (SO239) £99.95

MFJ Accessories

MFJ 259B ..HF/VHF Analyser.....£279.95
MFJ 269 ....HF/VHF/UHF analyser £349.95
MFJ 941E ..300W Tuner £139.95
MFJ 949E ..300W HF tuner £179.95
MFJ 16C06...4 pack Ceramic insulators.....£4.95
MFJ 260C ..300W Dummy load £44.95
MFJ 550 ....Morse Key.....£16.95
MFJ 901B ..Portable ATU £72.95
MFJ 945E ..300W Tuner £129.95
MFJ 948 ....300W Tuner w/balun £159.95
MFJ 969 ....300W Tuner £209.95
MFJ 971 ....200W Portable Tuner.....£118.95
MFJ 993B ..300W Tuner £249.95

Antennas and Accessories

Nevada Wire Antennas Covered Flexweave wire
G5RV .....Half size (40 – 10) £34.95
G5RV .....Full size (80 – 10).....£39.95
Windom .....Coax fed size (10/20/40).....£39.95
Windom .....Coax fed F/size (10/20/40/80)..£44.95

Hard drawn Copper Wire
G5RV .....Half size (40 – 10) £24.95
G5RV .....Full Size (80 – 10).....£29.95

Heavy Duty – PVC flexweave
WDM3 .....Windom Half size 1kW.....£69.95
WDM4 .....Windom Full size 1kW £89.95

Moonraker Antennas
GP-2500 .....Vertical (80-6m).....£199.95
225P .....2/70/23cms Colinear.....£74.95
1010N.....2/70/6metres Colinear £84.95

COMET Antennas and Accessories

HF/VHF/UHF Base Antennas
GP1.....144/430 MHz 3.0 / 6.0dbi 1.25m 59.95
GP3.....144/430 MHz 4.5 / 7.2dbi 1.78m 69.95
GP6.....144/430 MHz 6.5 / 9.0dbi 3.07m 99.95
GP15N .....50/144/430 MHz 3/6.2/8.6dbi 2.42m .99.95
GP98.....144/430/1200 MHz 2.94m long 139.00

1.2GHz Beam
CYA-1216E....16 element 1.2GHz yagi 99.00

Muliti Band HF Mobiles
UHV5 .....7/21/50/144/430MHz 100/200W.....79.95
UHV6 .....7/21/28/50144/430MHz 100/200W 1.9m L99.95

HF Mobile Whips PL259 Fitting
CHS10 .....10MHz 1.05m long 250W 29.95
CHS21 .....21MHz 0.95m long 300W 39.95
CHS50 .....50MHz 0.95m long 300W 39.95
HA035.....3.5MHz 1.13m long 120W 59.95
HFB10 .....28MHz 0.95m long 120W 39.95
HFB14 .....14MHz 0.95m long 250W 39.95
HFB40 .....7MHz 1.6m 250W.....39.95
HFB6 .....50MHz 0.95m 250W.....39.95
HR50.....50MHz 2.13m long 200W 49.95

Magnetic Mount Antennas
M24M.....144/430MHz 1.7 / 4.17dbi 0.48m L....29.95
M72S .....144/430MHz 1.7 / 3.5 dbi 0.52m L 29.95

VHF/UHF Mobile Whips PL259 Fitting
CSB7500 ...Super Beam mob whip 144/430MHz...49.95
CSB7700 ...Super Beam mob whip 144/430MHz ..54.00
CSB7900 ...Super Beam mob whip 144/430MHz...59.00

Handy Antennas
BNC-750 ...BNC HF whip 7-50MHz TX/RX.....79.95
CH32.....BNC 144/433/900MHz 45mm.....19.95
CH99.....BNC Tel Whip 70-1000MHz 195-1135mm L19.95
RX5 .....144/430/900MHz 44cm L 8W SMA 29.95
SH95 .....144/430/1200MHz 37cm L 10W BNC.29.95
SMA3 .....144/430/900MHz 25cm L 10W SMA ..24.95
SMA-501...144/430 MHz SMA 19.95
SMA-701...144/430/1200MHz SMA 19.95

Antenna Mounts
RS6 .....Roof Rack Mount - adjustable.....19.95
RS550 .....Roof Rack Mount - deluxe adjustable..19.95
RS700 .....Gutter Mount adjustable.....19.95
RS730 .....Trunk lip Mount adjustable.....19.95
RMS .....Magnetically mounted Gutter Clamp ...29.95
WS1M .....Window Mount deluxe SO239 plug.....39.95
WS1B .....Window Mount deluxe BNC plug 39.95
RS840 .....Trunk Lip ant mount.....24.95
RS-020B ....Trunk/Hatch back (Black).....21.50
RS-020S ....Trunk/Hatch back (Silver).....21.50

Motor Bike Mounts
BMB-S.....Motor bike bracket (Silver) 25.95
BMB-B.....Motor Bike Mount (Black) 25.95

Car/Caravan Mounts
CAUBI .....Trailer Mount - for HF whip antennas ..49.95

Cable Assemblies
3K054M ....4 metre cable SO239 to PL259 plug....24.95
3K054N.....4 metre cable So239 to N type plug....25.95

Current Baluns
TFA-400 ....(1.3-500MHz) 400W 69.95
TF-1800 ....(1.3-500MHz) 1.8kW.....79.95
TF-5000 ....(1.3-500MHz) 5 kW.....99.95

Low Pass Filters
CF30H .....Low Pass Filter 32 MHz 2kW 119.95
CF50MR ....Low Pass Filter 57 MHz 1kW.....49.95

LOWEST PRICES!!
100m Drums Guy Rope
Guy Rope 100 metre Drums
Military style, pre-stretched Olive Green

SYC-11 .....5mm 295kg.....£54.95
8 plait.....4mm 330kg.....£69.00
8 plait.....6mm 700kg.....£89.00
KT3 Kevlar .....2mm 400kg.....£59.00
KT-3 Kevlar ....5.5mm 760kg Olive Green.....£129.00

ALINCO

SAVE £49!

DJ-175
VHF 2m Rugged Handheld
- Transmit freq: 144-148MHz
- Receive: 136.00-173.995MHz
- Freq steps: 5, 10, 12.5, 20, 25 & 30kHz
- New 2-touch repeater function
- 200 memory channels + CALL channel
- CTCSS, DCS & DTMF encoding
- 1000, 1450, 1750 & 2100Hz tone bursts
- 3 levels of output power 5, 2 and 0.5 W
- With Battery and Charger

Nevada SPECIAL! ~~£149~~ £99.95

DJ-G7E Full Duplex Tri-Bander with 1200 MHz!
- Wide band receiver
- 2m/70cm/23cm bands
- Rugged water resistant case
- Inc: Drop-in Charger, Battery Pack, Swing Belt Clip, Antenna

Nevada BEST PRICES! £299.95

NEW!

DX-SR8
Affordable HF Transceiver - with a QPR Setting!
- Covers all SW & HF Amateur bands
- TX: SSB, CW, AM, FM
- Power: 100W SSB/CW, 40W FM
- QRP Mode: (0.1 to 2.0)W
- RX: 30kHz - 35MHz
- 600 channel memories in 3 banks

Nevada BEST PRICES! £549.00

DR-635
Full Featured Dual Band Mobile
- Removable Control Head
- VHF/UHF full duplex
- 144/430MHz plus wideband RX
- 200 Memory Channels
- VHF: 50/20/5W, UHF 35/20/5W

Nevada BEST PRICES! £299.00

DX-70TH
Mobile HF plus 6 metre TX
- LSB, USB,CW, AM, FM & digital modes
- All mode squelch scan facilities
- Narrow filters fitted as standard
- 100W output on HF & 6mtrs

Nevada BEST PRICES! £599.00

DM-330MW
30A Switching Power Supply
- Input voltage 230VAC
- Output voltage: (5 -15) VDC variable
- Protection circuits
- Output:: 30A(max), 25A (continuous)

Nevada SPECIAL! ~~£129~~ £99.95

W-8681
Wireless Weather station

~~£79.95~~ £69.95

For unbeatable deals online 24hr shopping 7 days a week

www.nevadaradio.co.uk

Unit 1 Fitzherbert Spur Farlington Portsmouth Hampshire PO6 1TT email sales@nevada.co.uk

PHONE 023 9231 3090

showroom hours Monday to Friday 9.00 - 17.30

HF

Plenty of DX news

The CDXC loan rig, see text for more details.

TOUGH LOCATION. I wrote last month that the 3C0 effort had been delayed but was on track for later in June. In the event they did manage to become active, but closed down early for logistical reasons, although it's not clear exactly what happened. But this is a tough location from which to operate, in terms of climate, living conditions and much else, so thanks should be extended to the two operators for at least making the effort and achieving almost 12,000 contacts in 83 hours of operation. Looking at the statistics, their main efforts were on 40 through 15m. They made about 200 UK contacts in all. After being forced to cut short the 3C0C effort, they did reappear as 3C9B from Equatorial Guinea for a short additional operation (they had passed through there a few days earlier *en route* to Annobon).

The E4X Palestine operation, in contrast, started up on schedule and appears to have met with a great deal of success, racking up just over 80,000 contacts. They were very loud in the UK on most bands, though the 160m QSO total was just 176, compared with over 6,000 on both 10 and 12m (and on 6m too, but I'll leave that to *RadCom*'s VHF columnist). They made about 1700 UK contacts in all.

IMPROVED PROPAGATION. A word about recent propagation, as every year around this time there seems to be some confusion about what is happening on 10 and 12m. 6m enthusiasts will be familiar with summer Sporadic-E, but HF operators sometimes fall into the trap of thinking that the improved band conditions are a result of the sunspot cycle finally taking a turn for the better (which, sadly, is not yet the case). Sporadic-E leads to very loud signals around Europe but occasionally clouds of high ionisation in the E layer will line up in a way that allows so-called multi-hop propagation to take place. Because there are high losses with each hop, signals are considerably weaker than single-hop, but recent openings have not only included North America on 10m but, during the All Asia contest, UK stations even managed to work Japan on 10.

You probably won't experience this with a dipole and low power, simply because path losses are so high, but those with beams and a linear have been able to take advantage. That said, VHF operators tend to resort to the low-signal datamodes such as JT6M when signals are weak and, increasingly, these modes are being used on the higher HF bands for the same purpose, taking advantage of band openings which might otherwise be too marginal to be of use. I have previously mentioned the use of WSPR mode in this context, too. There is more on all this in my *6 Metre Handbook*; it is equally applicable to HF.

DX NEWS. Not too much to report this time by way of forthcoming operations. No DXpedition organiser in his or her right mind would plan a DXpedition in August, unless it is purely a holiday effort. Band conditions in the northern hemisphere are much better in the autumn as we approach the equinox, and in any case many people are away from their shacks and on holiday in August (indeed, much of Europe closes down almost completely for the month). It's perhaps a good opportunity to do some antenna work in anticipation of the DX to come and, as I have hinted in recent columns, there are some very nice ones promised, especially for October/November.

For my own part, I recently did some serious reworking of my antenna system, which involved relocating one of my towers and dismantling the other. It involved hiring a digger to dig two 6ft-deep holes. I have to say that amateur radio training generally doesn't cover the operation of a digger, which requires a remarkable degree of dexterity! Fortunately, my son grew up on computer games and the like and was happy to do the difficult bit! I confined my own efforts to 'project management'.

The above does beg the question of what antenna(s) are most appropriate for DX working. While a low dipole is ideal for single-hop high-angle working around Europe, longer-haul contacts benefit hugely from a higher antenna (at least half a wavelength, preferably somewhat more) or, where this is not possible (which is likely to be the case on the low bands), a vertical with a good earth system. If you can achieve a gain antenna of some sort, so much the better, maybe not as a permanent structure but as something you can erect when there is a contest or rare expedition on the bands. On 40m, for example, a couple of 10m fishing poles can easily form the basis for a low-cost phased-vertical system. When 10, 12 or 15m are buzzing, a Yagi for one or more of those bands is significantly smaller and lighter than one for 20m and can maybe be erected on a scaffold pole – I well remember putting up a 3-element monoband Yagi for 10m on one occasion for one of the CQWW contests, atop a 20ft scaffold pole, manually rotated. I had a ball, especially when the band opened to North America.

Freddy, F5IRO, has begun a two year stay in Djibouti. He will have two HF rigs and plans to be active as J28RO on CW, SSB and digital modes, mostly on his weekends (Friday/Saturday) and during his afternoons and evenings, starting about 1200-1300 UTC. Vincent, Francaise des Telegraphistes (UFT) President, has been assigned a work assignment in Djibouti. His exact length of stay is unknown but he will be there for at least a year, possibly two. He has been issued the call J28JV and at first he will operate from a military location on Fridays and Saturdays until he gets his own residence, where he will set up his own station and be active during his evenings. Activity is expected on HF, including 12, 17 and 30m, mostly on CW and the digital modes and possibly SSB. Freddy and Vincent plan multiple IOTA trips to Mucha and Maskali (AF-053). F8DFP is the QSL manager for J28RO either direct or via the French REF QSL bureau. Direct requests should include SAE (self addressed envelope) and IRC. Please do not send any kind of money. All direct requests that do not include IRC and SAE will be answered via the bureau.

Terry, W6/G3MHV has just returned from Tibet and writes "Tibet has always evoked an air of mysticism dating back to the early days of AC4YN and the creation of Zone 23. A recent visit to Lhasa gave an opportunity to check on the present situation. There are four licensed operators currently in Tibet: two in Lhasa (BG0GF and BG0GH) and one each in Chamdo (BG0GI) and Shannan (BG0GG). We met and had dinner with the two operators in Lhasa. Special regulations are in force concerning radio operation in Tibet and, unfortunately, none of the current licensees has permission to operate on HF".

60m REPORT (from G4TRA). Mid summer is not the best time for DX on 60m with high levels of static and only short late night propagation stateside; however there has been some good European activity.

Although not for the first time the guys were on from Svalbard, mainly giving their fellow Norwegians contacts. JW5YI, JW6XI, JW1YM and JW4LN were heard operating CW. For the first time Croatia has been active on the band too, with Kris, 9A5K adding a new country to the list of many keen 60m operators. His licence is valid until 30 May 2011 and permits operation from 5260-5410kHz all

Photo taken in G3MHV's hotel in Lhasa: (from left) Terry, W6/G3MHV; Mady, KP3YL/W6; Lin, BG0GH and Ceming, BG0GF.

modes. Also for the first time Joe, CT3BD in Madeira has been heard, putting a good signal into the UK.

From further afield John, K9EL has been active as FS/K9EL from French St. Martin as has VP2MDD in Montserrat and V31YY (San, K5YY) in Belize, all of which are quite rare for this band.

Finally I am pleased to welcome all new NoVs to the band and would point them to my G4TRA QRZ.com entry for further information on this fascinating and unusual band.

(In addition to the above, RSGB HF Manager John, G3WKL mentions that 5.289 and 5.291MHz are being recommended for CW use here in the UK (which avoids interference to the beacon at 5.290MHz), although some recent DX CW activity has been taking place on 5.260MHz – G3XTT.).

VOAcap ONLINE. Jari, OH6BG, writes that VOAcap (Voice of America Coverage Analysis Program) Online has been opened to the public. VOAcap is a well-known HF propagation prediction program. The online package uses a QTH locator based on Google Maps. The prediction is given as a colour-coded 'circuit reliability' graph showing the probability of achieving a CW-grade transmission quality between the transmitter and the receiver. VOAcap Online was developed by Jari, OH6BG, James, KZ1JW and Juho, OH8GLV.

REMOTE OPERATION. The ARRL has recently put out a reminder about remote operation and DXCC. There have been a number of remote activities from a station in the US Virgin Islands, for example KP2/EB7DX. This operation and any others operating remote (controlled via internet, radio, telephone, etc.) where the operator is not in the same country as the transmitter do not count for DXCC. This is point number 9 in the DXCC rules, which can be found on the ARRL website.

CDXC PORTABLE RIGS. CDXC President G3NUG has asked me to remind readers that CDXC now has three portable rigs that can be borrowed by CDXC and RSGB members. They

The EA5/M0XJP portable setup, see text.

have been partially sponsored by CDXC but also by Martin Lynch & Sons, Neville, G3NUG, the RSGB IOTA Committee, Vibroplex and Yaesu UK Ltd. CDXC wishes to make these rigs widely available so as to encourage CDXC and RSGB members to enjoy the delights of DXpeditioning. They are ideal for small teams and for IOTA operations. Each rig comprises a Yaesu FT-450AT transceiver, MyDel MP 8230 switch mode power supply, Vibroplex Standard iambic paddle key, Heil ProSet 4 headset and mic, Heil HS-footswitch, documentation pack including detailed contents and a waterproof Peli 1550 case. The kit weighs 13kg. External dimensions of the case are 52 x 43 x 21cm. There is a further rig located in Kuala Lumpur, West Malaysia. This rig has a Yaesu FT-900 transceiver and has been used several times to activate the Malaysian IOTAs. There are some straightforward conditions of loan, which will be advised on application. To borrow either rig please contact Neville, G3NUG, by e-mail to g3nug@btinternet.com.

CORRESPONDENCE AND TABLES. Jim, MM0DXH worked most of his recent DX on 20 SSB, which yielded CE4UJU, J6/VE3CZF (an all-time new one for him), J88CF, OA4CN, TN5SN, VP2MRT and VP8LP (Falklands). Terry, G1UGH reports plenty of short-haul DX on 10m, via Sporadic-E, including TF/F5UFX, while 12m was similar, with best DX being E4X. Graeme, G6CSY mentions just 4L0A for a nice one on 10m.

Peter, G3HQT has been busy on CW and datamodes again, mentioning TN5SN, E4X, VP2EMR and R1ANP (Progress Base, Antarctica) on 30 CW, A61BK and OA4AI on 30 PSK, E4X, PZ5RA and FM5AA on 12 CW, TL0A on 12 RTTY and 7Z1SJ, PJ4/K4BAI, BY8AC plus 7Q7BJ on 10 CW. Colin MU0FAL worked IS0R for a new one on 160, plus E4X on all three WARC bands, the 30m contact taking his score to 200 countries on that band.

QSL for BG0GF showing the Potala Palace that dominates Lhasa.

2010 ANNUAL TABLE

(starting 1/1/10, sorted this month by 10m totals)

Call	10m	12m	80m	160m
GW4BLE	82	27	41	57
G3HQT	51	46	81	0
MU0FAL	49	72	65	51
GW0RYT	38	23	6	0
GW1PJP	36	39	0	0
G3TBK	35	58	79	100
G1UGH	28	25	0	0
G3SED	27	85	46	68
MM0DXH (SSB)	14	0	25	10
MD0CCE	13	94	85	101
M0VKY	13	0	38	38
G6CSY	12	2	44	21
G4FVK	7	0	26	0
MW0DNF (QRP)	5	7	10	0
GW0LKJ	0	9	0	0
G4XEX	0	6	25	1
G4ATA	0	0	105	0

Martin, M0XJP writes, "I thought that you mighty be interested in my recent operation from La Romana, near Alicante Spain (IM98ni) as EA5/M0XJP. I operated from 17 to 26 May 'holiday style' from the house of a friend up in the hills with good take off all around. I erected a full-size G5RV up about 30ft, but unfortunately with the ends angled down. I used an Alinco DX70TH running about 75 watts phone only, matching EDX-1 ATU and the small Alinco DM30MV PSU. It was interesting to see the difference in propagation compared to my home QTH in Knebworth. I made 131 contacts without trying too hard and, apart from all the usual European countries, some of the more interesting stations I worked included GB1ST on 40, TA3AX, LA1CI (near the Arctic Circle) and G4AKC/M (bicycle mobile, Blackpool, see *RadCom* March 2010 page 70 and this issue page 16) on 20m, CO8LY, PT7CB, LR1ECZ, Z21BC, BD5BAJ and G4AKC/M on 17, plus HI3/W1NWZ on 15. I also worked stations on 12 & 10m, but nothing very exciting! I heard nothing but local Spanish on 80m.

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 **October** issue by **Friday 21 August**.

WEBSEARCH
VOAcap Online: http://online.voacap.com

VHF/UHF

More exciting Sporadic-E openings on the VHF bands

PHOTO 1: The 6m, 4m and 2m antennas at the summer QTH of EA8/DL3GCS.

PROPAGATION SYNOPSIS. Your reports show that Sporadic-E (Es) propagation was truly exceptional during June with almost daily openings being reported on the 50MHz, 70MHz and 144MHz bands. Indeed propagation was so good that at times you could have mistaken the VHF bands for 21MHz. Just to whet your appetite how about China (BY), Japan (JA), Malaysia (9M), Mongolia (JT) and Vietnam (XV) on 50MHz, Canary Islands (EA8), Cyprus (5B4) and the Dodecanese Islands (SV5) on 70MHz and Algeria (7X), Crete (SV9) and Russia (UA) on the 144MHz band. And that was just a very small taster – it really was an exceptional month.

THE 50MHz BAND. Contacts via Es propagation were reported every day during June with normal single-hop paths up to 2000km being worked from all regions of the UK. However, in addition to the daily run-of-the-mill European contacts there were also 23 days during June when multi-hop paths existed across the Atlantic Ocean enabling contacts to be made into South America, North America and the numerous Caribbean islands. There were also 4 days when multi-hop Es was reported deep into the African continent and surprisingly 8 days with openings to the Far East over 10,000km distant. Neil Carr, G0JHC reports that this has been one of the best Es seasons on 50MHz in the last 25 years. In a 6 week period between 13 May and 24 June he worked 100 countries (DXCC) and during that time he actually heard 112 countries in 5 continents.

The majority of single-hop contacts made from the UK were fairly routine but even so there were still some choice nuggets amongst them such as the stations of C31PP (Andorra), ER1SS (Moldova), HV0A (Vatican City), JW7QIU (Svalbard), TA7X (Turkey) and OX3KQ (Greenland). Another ionospheric hop away and stations located in the Middle East, Asia and northern Africa could also be contacted. Some of these 50MHz stations included 4L50 (Georgia), 4Z4TL (Israel), A71EM (Qatar), A92GR and A92IO (Bahrain), E4X (Palestine), EA9IB (Ceuta), EX8MLE (Kyrgyzstan), EY8MM (Tajikistan), JY5HX (Jordan), ST2AR (Sudan), SU1SK (Egypt), UK8OM (Uzbekistan) and UN3M (Kazakhstan).

But there was much better DX than this over the multi-hop transatlantic path to North and South America. These openings were reported on 23 days during the period and that's more than 75% of the month when contacts to the west from the UK could be made in the range 6,000 to 10,000km distant. The majority of these openings commenced in the early evening after 1630UTC and continued for a few hours until fading out around 2200-2300UTC. A small number of openings however started up around 1200UTC and lasted for about 4 hours or so. All in all there was plenty of opportunity to pick up relatively rare countries and locator squares. So let's have a look at the mouth watering DX that you might have missed down at the CW and SSB end of the 50MHz band.

Down in South America were the stations of FY1FL (French Guiana), OA4TT (Peru), PZ5RA (Suriname), PV8AZ (Brazil), YN2N (Nicaragua), YN4SU (Costa Rica), YV4ESN, YV5NWG and YV7RCM (Venezuela) and 5J0BV (San Andres). John Webster, MM0BQN reports working the CW station of OA4TT at 2150UTC on 24 June over a path length of 10,103km. Now moving up to the central Caribbean area and it was great to see so much activity from the 50MHz stations of C6ANX (Bahamas), J6/WB4WXE (St. Lucia), FG5FR and FG5GP (Guadeloupe), FM5AA (Martinique), FS/W6JKV and FS/K9EL (St. Martin), HI3TEJ (Dominican Republic), KP4EIT and NP3CW (Puerto Rico), PJ2BVU (Netherlands Antilles), VP2EMR and VP2MRT (Montserrat), WP2B (Virgin Islands), 8P6DV (Barbados), 9Y4D, 9Y4VU and 9Z4BM (Trinidad & Tobago). In mainland North America there was the rare station of XE2WWW (Mexico), Canadian stations in the VE1, VE3 and VO (Newfoundland) call areas and very large numbers of USA stations in the W1, W2, W3, W4, W5, W8 and W9 call areas.

Curiously the African path to the south of the UK was not as prolific as in previous years. The only stations worked at great distance being those of J28AA (Djibouti) and TN5SN (Congo), although the beacon stations S9SIX (Sao Tome & Principe), TR0A (Gabon) and 9Q1D (Democratic Republic of Congo) were heard on a few occasions.

To make up for the lack of African contacts the very difficult path skirting the polar region to the Far East was open on 8 days during the period. As is normal for this type of opening all contacts were made using CW as signals can often be quite weak. The stations worked from the UK over 10,000km distant included BA7IO, BA7MG and BA8AG (China), Japanese stations in the JA1, 2, 6, 7, 8 and 9 call areas, JT0YAB (Mongolia), XV1X and XV9DT (Vietnam) and 9M2TO (Malaysia). Most openings, as expected, were in the 0500-0900UTC time frame although an opening on 6 June to the station of JT0YAB occurred between 1730-1850UTC. The expedition run by UA9YAB managed to contact GW3NAS, GW3YDX, GW7SMV, MW0ZZK and 15 G-stations. On 9 June between 0645-1030UTC there was an excellent opening to Japan with UK stations working JE1BMJ (QM05), JG2BRI (PM84), JA6GCE (PM52), JA6JPS (PL29), JE6AZU (PM51) and JA6WFM (PM52).

THE 70MHz BAND. There was a tremendous amount of activity on the 70MHz band during June with Es openings being reported virtually every day during the period. This is very much a dynamic band with countries gaining (or losing) authorisations on an almost monthly basis. In at the beginning of the month came the Italians (I, IS0, IT9) and San Marino (T7) and out in the middle of the month went the Spanish (EA, EA6, EA8, EA9). I mentioned last month that the only way to keep up to date with the latest allocations is to log onto the 4m website www.70mhz.org and navigate your way to the Operating section. It is particularly useful as many IARU Region 1 countries have completely different frequency allocations from the 500kHz that we are allocated.

During June many operators throughout the UK reported making CW, FM and SSB contacts with stations located in the Balearic Islands (EA6SX), Belgium (ON4IMM), Canary Islands (EA8BPX), Croatia (9A2SB), Czech Republic (OK1DFC), Denmark (OZ1DJJ), Estonia (ES2JL), Finland (OH2MFE), Germany (DH8WE), Greece (SV1DH), Dodecanese (SV5BYR), Crete (SV9GPV), Gibraltar (ZB3B), Italy (IF9/I2ADN), Luxembourg (LX2LA), Norway (LA8AV), Portugal (CT1DHM), Romania (YO2IS), San Marino (T70A), Sardinia (IS0AWZ), Slovakia (OM3PV), Slovenia (S51DI) and Spain (EA7HG).

Propagation via Es was at times very intense and enabled a few contacts to be made over some very long paths. The period 12-13 June was particularly good with the stations of EA8BPX, EA8YT and EA8/DL3GCS, all located in the Canary Islands, working stations as far north as Scotland. Stephan Senz, EA8/DL3GCS reports that he was operating from a holiday house located at 550m ASL on the island of El Hierro (IL17). Although he was only running low power into a 2-element HB9CV beam (see **Photo 1**) he managed to complete 70MHz CW and SSB contacts with 13 G stations, GW3LEW, GW6TEO, GW8IZR, GM0USI, GM0HIK and GM4FAM. The contact with the 4m station of GM4FAM was his best DX over a path of 3473km. But even that distance paled into insignificance when EA8/DL3GCS reported hearing the WE9XFT beacon, peaking up to 579 over a path some 5,760km distant. Surprisingly, at 1808UTC on 26 June, the WE9XFT beacon was heard over an even greater distance. It was spotted by Joe Kraft, CT1HZE peaking 539 over a path length of 6,081km! Commissioned by Brian Justin, WA1ZMS the beacon in Virginia, USA (FM07) is licensed as a non-amateur experimental station operating 24 hours a day until September 1. It is GPS locked and operates on 70.005MHz with a 3-element Yagi beaming towards Europe.

Cris Henderson, GM4FAM mentions that he was really pleased to contact both EA8YT (3,366km) and EA8/DL3GCS (3,473km) on 70MHz as he is only running 20W into a 6-element Yagi. The 7m high scaffold pole (see **Photo 2**) is actually mounted against a green Portakabin shack with the beam normally pointing south-east into southern Europe. Some of his other CW and SSB contacts made during June included the 4m stations of 9A2SB, CT1RVM, DI2AR, EA4WT, ES1CW, IZ5ZWU, LA9DL, OH1FJK, OK1MP, OM3PV, ON5SA and T70A.

Norman Banks, 5B4AIF (Cyprus KM64) reports that during the morning of 13 June he made three cross-band contacts with UK stations. Receiving on 70.205MHz with a simple dipole and replying on 50.140MHz he contacted G8HVY (3,250km), G4ASR (3,393km) and GW8ASD (3,440km). Norman also mentions that he is the Beacon Manager for Cyprus. Coincidentally I heard the 5B4CY beacon (KM64) at 1655UTC on 24 June peaking 529 some 3,442km distant. Operating on 70.113MHz, it runs 10W into a 6-element Yagi beaming towards the UK.

TABLE 1: TOP VHF DX CONTACTS MADE FROM THE UK DURING 2010.

Band	Mode	Date	UK/Locator	DX/Locator	Distance
6m	Es	31 May	G0JHC (IO83)	9M2TO (OJ05)	10,370km
4m	Es	26 May	GM4FAM (IO77)	EA8/DL3GCS (IL17)	3,236km
2m	Es	11 June	G4LOH (IO70)	SV9CVY (KM25)	2,947km
2m	Au	2 May	G4RRA (IO80)	LY2WR (KO24)	1,943km
2m	Tropo	2 June	M0VRL (IO70)	EB8BRZ (IL27)	2,673km

A transatlantic cross-band contact was completed at 2126UTC on 24 June between CT1HZE (Portugal IM57) on 70.187MHz and K1SIX (USA FN43) transmitting on the 50MHz band. The CW signal from CT1HZE peaked 569 and was heard in New Hampshire over the 5,268km path for nearly two hours. However that contact was not the first time a transatlantic cross-band QSO has been made. The first evidence of DX possibilities on the 70MHz band came in January 1957 when the station of W2ZKE (USA) claimed to have heard G3EHY and later in the same year, in November 1957, the station of W2IDZ heard UK amateur radio signals around mid-afternoon but was unable to confirm any callsigns. The first authenticated contact was achieved surprisingly nearly 30 years ago at 1627UTC on 17 November 1980 when the 70MHz station of Gordon Pheasant, G4BPY contacted the 50MHz station of Andy McLellan, VE1ASJ over a distance of 4,591km. A year later, on 4 November 1981, the transatlantic path was broken again with the Canadian station of VE1ASJ making 28MHz cross-band contacts with the 70MHz stations of G4JCC at 1356UTC and GW4HXO, for the first GW, at 1422UTC. Further cross-band contacts were then made on 8 December 1981 with VE1ASJ, this time on the 50MHz band, completing QSOs with EI6AS, EI6DT, G2AOK, G3APY and GW3MHW. All these contacts were made via F2-propagation at the peak of the sunspot cycle. Three years ago during the evening of 25 June 2007 a 4,612km cross-band contact was achieved between Nigel Coleman, G7CNF transmitting on 70.102MHz and Mike Smith, VE9AA (Canada FN66) transmitting on the 50MHz band. What made that contact between G7CNF and VE9AA (and CT1HZE to K1SIX) particularly interesting was that it was accomplished via Es propagation around sunspot minimum rather than F2-layer propagation during the sunspot maximum period.

PHOTO 2: The 6m and 4m antennas at the QTH of Cris Henderson, GM4FAM.

THE 144MHz BAND. It was very noticeable that Es openings on the 144MHz band have been much more prolific this season than in previous years. Last month I reported two openings that occurred in May, the first on the 17th to Greece (SV) and the second on the 24th to Greece, Austria (OE), Balearic Islands (EA6), Croatia (9A), Germany (DL), Hungary (HA), Italy (I), Slovenia (S5) and Poland (SP). Propagation was infinitely better during the following month with 19 separate events being reported on 1, 2, 7, 9, 10, 11, 13, 14, 19, 20 and 24 June.

Last year the majority of 144MHz openings were in a southerly direction towards the Canary Islands (EA8), Madeira (CT3), Spain (EA), Portugal (CT), Gibraltar (ZB), Morocco (CN) and Ceuta (EA9). This year the Es openings have been spread over a considerable area, from the Baltic states of Belarus (EW), Latvia (YL) and Lithuania (LY), through eastern and south-eastern European countries such as Russia (UA), Ukraine (UT), Bulgaria (LZ), Romania (YO) and Turkey (TA), through the Mediterranean area, Corsica (TK), Malta (9H), Sardinia (IS), Sicily (IT) and south to Algeria (7X), Portugal and Spain. In total I recorded that 30 DXCC countries were worked from the UK via Es propagation during June so let's look at those openings in a little more detail.

Two 144MHz events occurred on 1 June, the first between 1415-1500UTC to the Czech Republic, Hungary, Romania, Serbia and Slovakia and the second between 1645-1830UTC to Belarus, Latvia, Lithuania and European Russia. In both openings stations as far north as Scotland could participate in the Es openings. The event to the Baltic area was relatively rare and included amongst

others the 144MHz stations of EW6BA (KO55), LY2CH (KO15), LY2GD (KO37), UY5UG (KO50), YL2OK (KO37), YL3GDF (KO26), RX1AS (KO59) and UA1WCF (KO55). Some of the longer distance SSB contacts made during this event included G4ASR (IO81) to RA3LBK (KO64) at 2,400km, GM4VVX (IO78) to RA3WDK (KO81) at 2,526km and G4HGI (IO83) to UA3XBF (KO84) at 2,627km.

Surprisingly, another Russian event occurred the next day, 2 June, between 0950-1050UTC. This one was generally restricted to stations located on the eastern side of England albeit in a line that stretched from Essex (JO01) in the south right up to Durham (IO94) in the north. John Wood, G4EAT (JO01) running 350W and a 9-element Yagi worked the SSB stations of EW6BA, EW6DX, RA1WU, RA3LE, RA3LX and RA3IS for best DX at 2,332km. Nick Peckett, G4KUX (IO94) reports contacting EW6DX at 1,940km, RA3LW at 2,097km and UA3YCV at 2,231km distant.

The main event on 7 June took place between 1010-1120UTC although some stations did report a very brief opening at 0700UTC to the station of SV3CYM (Greece KM08). The larger scale opening later in the morning saw operators in southern England making SSB contacts with stations such as LZ3RX, LZ5GM (Bulgaria), UX0FF, UT5JCW (Ukraine), YO7LGI, YO8RHI (Romania), YT3I and YU1EV (Serbia).

A short Es opening between 1738-1751UTC was reported on 9 June. At my QTH (Herefordshire, IO81) there had been a very strong opening to the Czech Republic (OK) and Slovakia (OM) on the 70MHz band for some hours beforehand. Suddenly the 144MHz band opened up to the same area and SSB contacts were quickly made with OK2BFH, OK2BMU, OK2PM, OK2VWB (all in JN99), OK1FPR (JO80), OM3WFC (KN18), HA5UK (JN97), SP6MLK (JO80), 9A1CAL (JN86) and 9A1CCY (JN85).

The Es openings on 10 June were most unusual indeed. The first event started around 1915UTC and lasted for an hour before fading out at 2015UTC. The opening encompassed much of the UK with stations from the Isle of Wight (IO90) right up to the Glasgow area (IO75) making SSB contacts into the Balearic Islands (EA6), Spain (EA) and Portugal (CT). Reg Woolley, G8VHI reports that he decided to check the simplex FM channels for possible DX stations and found 7X2RF (Algeria JM16) operating on 145.500MHz some 1792km distant. The Algerian (see **Photo 3**) was running 50W from FT-8900R transceiver into a vertical antenna. The station of G8VHI (Warwickshire IO92) and others in the Midlands area then managed to make a two-way FM contact with this rare DXCC country. At 2100UTC the band opened up again for about 15 minutes, SSB contacts being made with stations such as CT1EAT, CT1EEB, EA6SA and EA6VQ. Then just after midnight, at 2305UTC, the 144MHz band opened up yet again with stations in Portugal working into the UK and Ireland. This event went on until at least 0040UTC (1.40am!) before fading out. At my QTH I could hear the station of CT1HZE with a booming 59+ signal on and off between 2300-0035UTC. Unfortunately due to the lateness of the hour most DX stations had closed down but I still managed to work CT1EEB (IN50) and CR5A (IM59) both with 59 signals at 1am. The opening was quite widespread as CT1HZE reported contacting the stations of G7RAU (Isle of Wight, IO90), GI6ATZ (Co. Down, IO74) and GM4ZMK (Dunbartonshire, IO75) as well as hearing the GB3NGI beacon (Ballymena, IO65) operating on 144.482MHz. This event was completely unprecedented as Es propagation so high in frequency at this time of night has never, to my knowledge, been recorded before in the UK.

After such a late night opening I just knew that Es propagation would be good the following morning. And I was right, with the 144MHz stations of F1SNR (JN33), IK0SMG (JN61), IS0SWW (JN40), IT9BLB/9 (JM68), IT9CJC (JM76) and TK5JJ (JN41) all getting in the log book between 0650-0800UTC. This early morning opening on 11 June again covered much of the UK with stations in G, GI, GM and GW getting in on the action. The best DX during this event was made at 0658UTC between the station of G4LOH (Cornwall, IO70) and SV9CVY (Crete, KM25) over a 2,947km chordal hop path.

Three separate openings were reported on 13 June, one in the morning and two later in the day. The first event between 0815-0850UTC saw stations in southern England and Wales making contacts into Bulgaria, Croatia and Serbia. The next opening between 1608-1624UTC was locked onto the island of Sicily. The station of IT9VDQ/9 (JM68) running 500W into an 18-element Yagi reported making SSB contacts with EI4DQ, EI8IQ, G4RRA, G4DOL and GW7SMV. By 1650UTC an Es cloud had formed in a more convenient location enabling numerous contacts to be made until 1735UTC with stations in Austria, Czech Republic, Germany, Hungary, Italy and Serbia. The maximum usable frequency (MUF) was very high – over 200MHz at times – and many short-skip contacts were reported between southern England and southern Germany.

Although a minor opening to Greece, Italy and Sicily occurred around 1610UTC on 14 June the main Es event took place between 1745-1815UTC. This was a Mediterranean affair with contacts being made from southern England and Wales with stations in Malta, Sicily and the Balearic Islands. Interestingly the path extended for a few minutes into Algeria with the station of 7X2VX (JM16) working G6HKS and G8HGN on 144.300MHz.

PHOTO 3: Confirming the 2m Sporadic-E QSO between 7X2RF and G8VHI.

A lengthy opening between 1630-1915UTC on 19 June saw UK stations in south-eastern England making contacts into Bulgaria, Greece, Romania, Serbia and Turkey. Some of the DX contacts included the stations of LZ4KK, SV3BSF, SW6KRV, TA2AD, YO3DMU and YU7ACO.

The first opening on 20 June between 1104-1140UTC was yet another Russian event with the SSB stations of EW6BA, RA3IM, RA3LE, RK3AF and RV3YM contacting stations in central and southern England. Paul, G4RRA heard the Muscovite UA3ARC some 2,767km distant but unfortunately couldn't break the pile-up. A brief opening occurred between 1203-1216UTC and enabled stations in Cornwall (IN69, IO70) to make contacts into Croatia and Italy. A longer opening was reported between 1300-1430UTC with stations over much of the UK (G, GM, GW) working into the Balearic Islands, Corsica, France, Spain and further to the east into Italy, Slovenia and Romania.

The final 144MHz opening of the month, at 1612UTC on 24 June, was a very short event lasting only 10 minutes. The path geometry was such that it enabled stations in Wales and the Midlands to make contacts into Croatia and Slovenia. Further to the south the station of Syd Smith-Gauvin, GJ0JSY (Jersey, IN89) running an FT-225RD transceiver worked LZ3RX (KN12) and 9H5CY (JM75).

DEADLINES. What a tremendous month. The summer Es season is not quite over and you can still expect occasional openings on both the 50MHz and 70MHz bands. Openings on the 144MHz band in August are quite rare but not impossible so keep your receiver tuned to 144.300MHz. Good luck and if you do hear or work any DX stations on the VHF or UHF bands then please send your reports to g4asr@btinternet.com to reach me *by the end of each month*. Alternatively you can send letters to Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP.
73 David G4ASR

RSGB shop

NEW

FROM £11.04

Microwave Know How

for the Radio Amateur

By Andy Barter, G8ATD

Microwave Know How is a new compilation of articles aimed at those who are interested in building equipment for the amateur radio microwave bands. The designs in this book are from authors all around the world who are keen microwave constructors themselves. This ensures that all of the projects use modern techniques and up to date components.

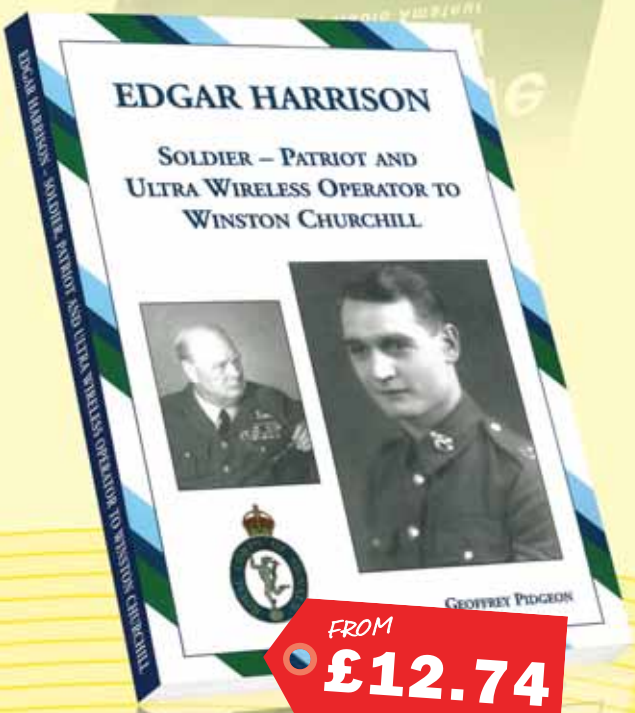
The book includes chapters covering:

- Antennas with designs for 23cm, 13cm, 6cm.
- Power amplifiers for 23cm and 10GHz.
- Measuring equipment, with different ways to use a spectrum analyser and a very useful noise source.
- Filters and design of filters, useful for the accomplished constructor and a Hybrid coupler for 13cm.
- Modifying commercial equipment with details for using surplus equipment to get on 5.7GHz, 10GHz and 24GHz.
- Converter for S band using a YIG LO and a 2m down converter for use with SDRs.
- Oscillators showing how to use a DDS and MMICs.

If you are already active on the microwave bands or simply looking for interesting projects *Microwave Know How* will show you how easy it is to become more active using modern devices and equipment.

Size 174x240mm, 184 pages, ISBN 9781-9050-8656-6

Non Members' Price £12.99 **RSGB Members' Price £11.04**



FROM £12.74

Edgar Harrison:

Soldier, Patriot and Ultra Wireless Operator to Winston Churchill

By Geoffrey Pidgeon

Edgar Harrison had the most extraordinary life, from joining the Army as a 14 year old apprentice and a posting to China he was moved out of the blue into MI6 and the British intelligence HQ at Waddon Hall. Following stints in Norway, Brussels and retreat via Dunkirk he was posted to Greece where he escaped from the advancing Germans in a rowing boat to rescue by a British warship. Edgar was soon parachuted into Yugoslavia with wireless gear for General Mihailovic before being sent to the Ukraine for the training Russian tank crews in the use of wireless equipment. Edgar even set up the agents' wireless station for the SAS and the Long Range Desert Group deep in the Libyan Desert. Eventually Edgar returned to MI6's HQ at Whaddon Hall, five miles west of Bletchley Park, before going to France and Germany. During this time he was also assigned to Winston Churchill as the MI6 wireless operator at meetings with Allied leaders. Passing the leader the decoded German Enigma signals know as Ultra. After the war Edgar became the Principal Signals Officer of the Foreign Office.

This biography provides a glimpse of one of the great WWII stories and is recommended to everyone interested in MI6 the work carried out by its signals operators.

Size 177x255 mm, 232 pages, ISBN 9780-9560-5150-9

Non Members' Price £14.99 **RSGB Members' Price £12.74**

Radio Society of Great Britain
3 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

GHz Bands

Lots of EME activity and the first 2010 10GHz Cumulative to report

PHOTO 1: R2/DL1YMK dish set up for 2.3GHz operation from the strawberry patch! Photo DL1YMK

BAND ACTIVITY. The increasingly-popular DUBUS/REF 1296MHz CW moon bounce (EME) contest took place in May, with lots of activity off the moon. The first 5.7, 10 and 24GHz Cumulative contest of 2010 was held at the end of May.

KALININGRAD (R2) EME EXPEDITION. Since I missed the EME report last month, it is top of the activity list this month. As a prelude to the DUBUS/REF 1296MHz contest the team of Michael and Monika, operating as R2/DL1YMK, visited Kaliningrad (R2) as the latest location for one of their EME expeditions. The former military restricted area opened in 1991 but has not issued any guest licences for VHF and above since then, so it was a much sought-after entity.

Arriving the week before the DUBUS contest, Michael and Monika set up their 4.1m stressed dish on a strawberry patch (with their host's permission). The dish is shown in **Photo 1**, set up amongst the fruit. On the evening of 13 May they began operating on 1296MHz EME, working OK1DFC for the first QSO, followed by many more stations who were eager to get R2 into the log book. The QSOs were mainly on CW but there were a few SSB contacts as well. As I was at Dayton I had to wait until 20 May to work them on 23cm using JT65C mode. The reports were -18dB/0.

In all, the expedition logged 209 contacts on the bands, 432MHz, 1.3GHz and 2.3GHz. On 1.3GHz they had 130 QSOs that included 79 initials (#) and 35 DXCC entities. On 2.3GHz they had 37 contacts with 28 initials and 20 DXCC entities.

Michael and Monika operated in the European World Wide Dubus/REF EME contest on the weekend of 22/23 May. They finally packed away the dish on 24 May.

DUBUS/REF CW 1296MHz EME CONTEST. By all accounts the number of QSOs was well up on last year, reflecting the growing interest in EME. At the time of writing it would appear that DL0SHF is the lead station with an unconfirmed 400,200 points; SM4IVE is close behind.

The following reports were extracted from *Moon-net* **[1]**, *Moon* **[2]** and the *432MHz And Above EME* Newsletter **[3]**.

Guenter, DL4DEA worked 49 stations on the Saturday and 11 on the Sunday. He uses an FT847 transceiver and an SDR running Winrad [4] to produce a waterfall display. On transmit he uses a TH347 valve at 750W RF output (less 2dB cable loss) to a 4.5m dish. His feed is a round septum horn with Chaparral choke. The LNA measures 0.3dB NF.

Doug, VK3UM worked 59 stations over the two days. His limited moon window (due to his southern hemisphere location) meant that several stations were worked at very low dish elevation (down to 0.3°!). At this elevation the ground noise contribution would be very high.

Luis, CT1DMK worked 37 stations and heard but didn't get a response from (called with no response – CWNR) 16 including yours truly. Luis uses a VE4MA scalar feed to a 5.6m dish on a polar mount.

Peter, G3LTF worked 50 stations including several through trees that were in leaf. He comments that activity levels were high except in the USA. This was a common comment from stations in Europe.

DL0SHF was initially operated remotely, over the internet, by Carsten, DL6LAU from 150km away. On the Sunday he drove to the dish location and operated manually, using a Flex5000 with DB6NT 1296H-28 transverter in order to get some comparisons with the existing receiver system. He comments that it did show an improvement when trying to pick out weak stations. Following his return to home in order to resume remote operation, he found that the server at DL0SHF had died, so no new stations were added to the score.

I managed to work 9 stations over the two days. That is one more than last year. I have to say that I am not a serious EME contest operator, but it is an opportunity to work new stations and see where the activity is.

I was impressed by the number of stations that were active and quite audible on my small (2.3m) dish. **Figure 1** shows a screen shot from *Spectravue* **[5]** running on an SDR-IQ at my QTH. There are 14 stations active in the shot period. One of the vertical lines is actually a 'birdie' from one of the many PC systems running here.

5.7/10/24GHz FIRST CUMULATIVE CONTEST. In its latest form the Cumulative contest now includes 5.7 and 24GHz together with 10GHz. Unfortunately, it would appear that for various reasons the first Cumulative of 2010 was not so well supported as in previous years. The following report is from Martyn, G3UKV, on behalf of the Telford group.

Telford & DARS (G3ZME/P) went to IO82. From there they had six QSOs on 5.7GHz with ODX as G4ALY in IO70 at 249km. On 10GHz the score was better with 18 QSOs, including a couple with fellow club members who went roving using borrowed equipment. Best DX was F6DKW in JO18 at 533km. Keith, GW3TKH went roving on 24GHz giving the Telford lads three QSOs. An exciting 'heard only' signal from John G4EAT in Danbury (JO01HR) at 235km was the other highlight on this now sparsely occupied band. Martyn says he is on the lookout for one of the Millitech 2.5 watt amplifiers in the hope of making the G4EAT contact a two-way next time out.

Steve, G1MPW, sent in a report that mainly details progress on the 24GHz

PHOTO 2: Some of the varied microwave surplus that was available at reasonable prices at Hamvention 2010.

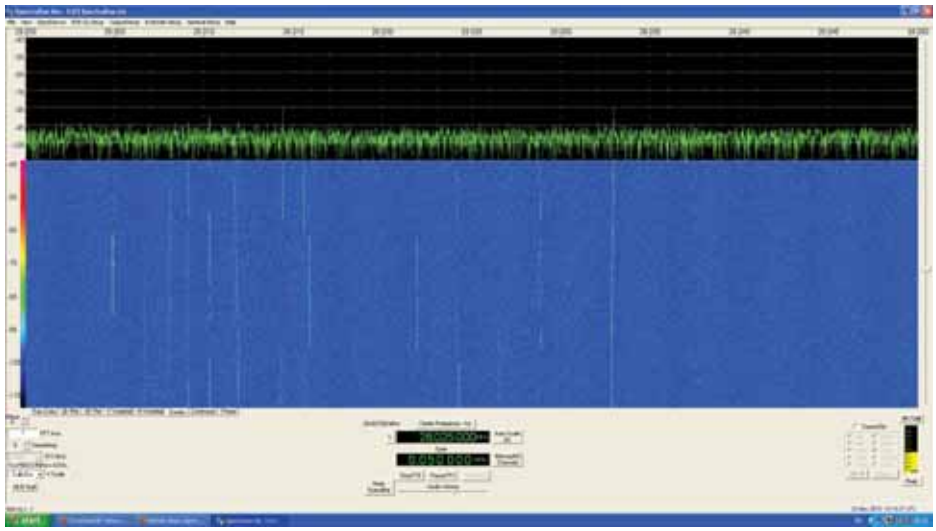


FIGURE 1: A *Spectravue* screen shot of activity between 1296.000MHz and 1296.050MHz in the Dubus/REF CW contest.

systems belonging to him and Dave, G6KIE. They now run G8ACE 10MHz OXCO and PLL controlled local oscillators. In the contest they went to Firle Beacon from where they both managed a 2 way QSO with G8CUB at 5/9 both ways at a distance of 54km. Steve came close to making a QSO with John, G4EAT. Steve could copy his RST (419) but sadly John couldn't copy anything more from Steve to complete the QSO. Brian, G4NNS heard and saw Dave's signal over a rather obstructed 118km path and sent them a screenshot from *Spectran* as confirmation. It looks like we have another two enthusiastic 24GHz operators for the coming season.

DAYTON 2010. Dayton Hamvention® is probably the largest get-together of microwavers from around the world. Combine this with the endless flea market area with its many 'booths' selling microwave related bits and you have a 'microwave heaven' for any visiting microwavers!

This was the first time I had returned to Hamvention since 2006 and it was noticeable that there were fewer people around than in that year and there were more open spaces in the large flea market area. However, I am told, the attendance was notably up on last year, at a little over 20,000. The great weather probably helped.

Why does Hamvention attract so many microwavers? Apart from the many bargains to be had, the social events are not to be missed. Just as the QRP enthusiasts have their '4 days in May' events at Dayton, so the microwavers and moonbouncers have evening dinner meetings, which are more than just a sit down meal. I attended two such events whilst there.

During previous visits the South East Weak Signal Group (SEWSG) had met on the Thursday evening at the 'Shuckin Shack' in Trotwood. The group had to move to another venue in downtown Dayton after the 'Shack' closed a few years back. Here I got to meet up with many of my old VHF and microwave friends, to discuss technical developments, what expeditions were being organised and, most important, what bargains to look for in the flea market on the following day.

A most convivial evening was had by all.

Friday evening is the big event for us. That is the evening when the microwavers and EME enthusiasts get together at a downtown hotel for the 'banquet', after dinner talk and prize giving event. The prize giving is a traditional event in the USA and consists of lots of 'door' prizes given away according to door entry ticket numbers. At least 150 people attended the meeting including a great many active and 'would be' EME operators from around the world. If you are visiting Hamvention in future years, contact Tony Emmanuel, WA8RJF, prior to going and arrange to attend this event.

As usual, I based myself at pitch 915 with Kent, WA5VJB, where we were selling everything from microwave parts to Kent's PCB based antennas. This is a great way to meet everyone as they browse the market. We take it in turns to man the booth to enable each other to go browsing other booths. We use elderly Yaesu 911 transceivers (handy talkies) on 1296.100MHz FM to keep in touch. We've found that 23cm FM manages to reach the parts (especially inside the main halls) that lower band radios fail to reach. It also avoids the very congested 6m, 2m, 1.25m and 70cm channels that tend to be well used at Hamvention. Even on 1296.100MHz we had at least one other on-site user! **Photo 2** shows some of the microwave 'goodies' I found on just one flea market booth.

Down East Microwave and Flex Radio had set up a demonstration 1.3GHz link between their booths in different halls (there are five halls at the Dayton Hara Arena) to show the effects on 1.3GHz signals of people moving around in the halls. The signal at the Flex Radio end was demonstrated on a waterfall display produced by Flex1500 running *PowerSDR* software. Both ends of the link used DEMI 1.3GHz transverters.

In addition to the Flex Radio and DEMI demonstration there was a very busy D-Star booth with, as far as I could see, a 1.3GHz repeater running at 128kbit/s. There can be little doubt about the enthusiasm for D-Star in the USA.

Just to round off my visit to Dayton (via Dallas and a long drive) I met up with well known Texas microwave and EME operators Gerald, K5GW and Dave, WW2R, at Dallas Fort Worth airport. I thoroughly enjoyed my return visit to Dayton this year. It is one of those events you just have to attend.

My thanks to Kent, WA5VJB, for hosting me and for being such a good travel companion on the long drive. In 2345 miles we didn't experience one traffic hold up or other delay.

FORTHCOMING MICROWAVE EVENTS - 2010

14th International EME Conference, Dallas, Texas, 12 – 14 August. Details: www.ntms.org.

Crawley Microwave Round Table, 12 September. Details: www.carc.org.uk/modes/microwave.shtml.

55th UKW Tagung (Weinheim), 11, 12 September. Details: www.ukw-tagung.de.

RSGB Convention (with VHF and Microwave stream), Horwood House, Milton Keynes, 10 – 12 October. Details: www.rsgb.org/rsgbconvention.

Microwave Update, Cerritos, California, 21 – 24 October. Details: www.microwaveupdate.org.

Martlesham Microwave Round Table, 13, 14 November. Details: http://mmrt.homedns.org or from John Quarmby, G3XDY, G3XDY@btinternet.com.

WEBSEARCH

[1] Moon-net: www.nlsa.com/nets/moon-net-help.html
[2] Moon: www.moonbounce.info/mailman/listinfo/moon
[3] 432MHz and above EME Newsletter: www.nitehawk.com/rasmit/em70cm.html
[4] Winrad: www.sdrham.com
[5] Spectravue: www.moetronix.com/spectravue.htm

Start Here

More on *Logbook of the World*

UPLOADING YOUR LOGBOOK. For those of you who already use some form of computer logbook, using *Logbook of the World (LoTW)* is fairly straightforward. To get your contacts into the right format, you need to export your logbook either as a Cabrillo file or as an ADIF file. Almost all major computer logbooks support one or the other of these formats. Save this file in the *LoTW* folder we suggested that you create last month and then open the *TQSL* program. Once in *TQSL*, you need to make a station location by selecting 'Add location' from the Station menu. Follow through the on screen help to supply station details such as your IOTA reference (if applicable) or locator square if you wish. If you want to change/add details later, select 'Edit location' from the Station menu and follow the directions. You can add multiple station locations to reflect your activities, such as operating portable on holidays or if you change QTH. Use the 'Add location' option as before but specify the details now for your new location and label it clearly and appropriately, see **Figure 1**.

Now that you have created a location, you can digitally sign your logbook using the *TQSL* program. Under File, select 'Sign an existing ADIF or Cabrillo file'. Follow the instructions on screen, selecting (highlight) the appropriate station location. Click OK and then navigate to your *LoTW* folder and open the file that you exported your logbook to. Next you need to choose a location and filename for the .TQ8 file – this is the signed, encrypted copy of your log that you upload to *LoTW*.

Caution: depending on how you exported your logbook, it may contain more than one callsign (such as previous Foundation/ Intermediate calls you may have held) or portable calls. It may also contain QSOs under your callsign but from a different location, eg because you moved house. In order for LoTW to accurately reflect your activities and for QSLs to be given, you must make sure that you sign each portion of your log with the correct certificate and station location. For this reason, TQSL allows you to specify start and end dates for the QSOs to be signed and uploaded. QSOs that don't fall within the range you specified aren't uploaded.

OTHER CALLSIGNS YOU MAY HAVE USED/ NEW CERTIFICATES. Each callsign that you wish to upload logs to *LoTW* requires its own certificate. In most cases you can sign these using your primary certificate but, as mentioned last month, some of the more unusual locations require additional material to be sent to the ARRL for the operation to become valid for DXCC.

To request another certificate, such as for your portable operation, open *TQSL* Cert. Under File, select 'New Certificate Request' and follow the onscreen instructions,

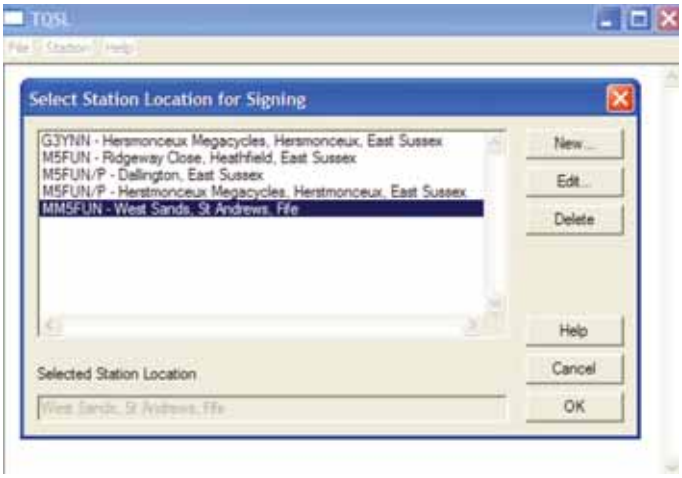


FIGURE 1: Selecting the station location in *TQSL*.

remembering that the start date is when the call was first issued to you and the end date may be left blank if the call is current or insert the last date that you last made contacts with the call if it is no longer valid. In the last window you are asked to sign the log using a primary certificate. This is a certificate for a call that you submitted documentation to the ARRL for. Highlight the appropriate certificate, make sure that the signed button is ticked and save the .TQ5 file to your *LoTW* folder. Finally upload the .TQ5 file to https://p1k.arrl.org/lotw/upload and wait to receive the resulting .TQ6 file from the ARRL.

Good Practice: depending on how your logging program exported your logbook, you may have to work a bit in order to make sure you sign each portion of your log with the correct certificate and station location by signing several files each with different date ranges. If you're lucky though and your computer log can produce one ADIF file per callsign then, for your first upload, you can simply sign your main callsign with the start date as the date that call was first issued to you and you can leave the end date blank.

To upload your latest QSOs to *LoTW*, assuming you have them sorted into a separate file for each call you use, simply use the end date of your previous upload for that particular call as the start date for the next upload and leave the end date blank. It's worth making a note in your logbook/calendar when you last uploaded to *LoTW*! Also, it's good practice to name each file you upload with something intelligible such as 'fun_May_10' so that you know that particular file uploaded your latest QSOs to the end of May 2010.

UPLOADING THE .TQ8 FILE. Now that you have at least one .TQ8 file, it's time to upload it to the *LoTW* computers. This is done by logging into *LoTW* via https://p1k.arrl.org/ lotwuser/default with your username and password, then click on the 'Upload' tab. Use the Browse button to locate the .TQ8 file that you wish to upload and click Upload. This will send your file to be queued for processing. Returning to the home page or checking back in a few minutes/hours is normally sufficient to see that your QSO total should have increased and you should see any resulting matches. If something doesn't quite seem to have worked, you can click on the 'Your Account' tab and on the left hand menu, select 'Your activity' (see **Figure 2**). This should show you the last files you uploaded. Clicking on 'Results' allows you to see the details of what happened.

PAPER LOGS/ONLY A FEW QSOS. It's understandable when amateurs say that they don't keep a computer log. Perhaps it's the thought of having to type up thousands of paper QSOs or maybe the original logs got lost in the past, ie you moved houses and your logs didn't follow. However, this isn't an excuse for not using *LoTW* as you can upload contacts in any order – indeed many amateurs often upload their current call first and then go back, uploading their oundation/Intermediate/ holiday calls etc when they have time.

You don't need to have a computer logging program to do this. To upload small numbers of QSOs, open *TQSL* and under File, select 'Create New ADIF file…'. This allows you to enter QSOs as you wish and create a file that you can then sign in the same manner above. This is great if you don't want to upload your whole log but would like to get credit for that DXpedition or special station that you worked (assuming they also use *LoTW*!).

CONTEST LOGS. Your Cabrillo contest logs are straightforward to upload. Use the same method given in the general description above. Make sure you sign it with the correct certificate. You need a new certificate for a short contest callsign for signing contacts made with the short call.

HOW OFTEN SHOULD I UPLOAD TO *LoTW*?

This is a tricky question – if you are a rare DX station, it's likely that lots of people would like your confirmation as soon as possible! However, if you only make a few contacts from time to time then it's not as pressing to upload. Generally speaking, uploading to *LoTW* between once a month and once a year is more than adequate depending on your activity levels and desire to chase QSLs/DXCC. If you operate in a contest and have your Cabrillo file handy, then there's no real excuse when you've submitted it to the adjudicators, not to sign it and upload it right away as there is minimal effort needed!

EEEK - I BUSTED A CALLSIGN!

Everybody makes a mistake at some point, perhaps it's from writing up your scrap paper QSOs or a bad decode in Morse/data. There are two main ways you notice this with respect to *LoTW*. Firstly you receive a traditional QSL card from a station that's not in your log, or secondly you believe you made a contact with that rare DX station who said they use *LoTW*, but have not received confirmation.

In the first case, you should check through your log to see if there is a similar QSO, either the station wrote the date/time down wrong or maybe you missed a dit when you decoded the callsign. If there is a genuine reason to think the QSO took place then you can reply with a QSL card but you should also update *LoTW* for completeness. *LoTW* doesn't allow you to remove QSOs that you've uploaded. If the data is wrong, then no QSL match should be possible. Instead, you should use *TQSL* to create an ADIF file containing the correction, sign it and upload it. If the other station is using *LoTW* then you should get a match. If there's not a genuine reason to believe that the QSO took place, then out of politeness you should return the card saying not in log or drop the other station an e-mail to let them know you're not ignoring them.

FIGURE 2: Your Activity section of Your Account in *LoTW*.

In the second case, you can use the Find Call feature on *LoTW*. Log into *LoTW* and select Find Call from the options. You can enter a callsign and if they have uploaded to *LoTW* it should tell you the date of the last time they uploaded or say that they have no data in *LoTW*. If they have uploaded since your QSO occurred, it's worth contacting them again or emailing to see if they made an error at their end. Otherwise you have to wait patiently for them to upload their log.

Logbook of the World is an evolving development in modern amateur radio. In the past two articles we've briefly touched on getting you started, but there are still plenty of features to explore and exciting ideas under development. If you need help exploring *LoTW* further, the ARRL website www.arrl.org/logbook-of-the-world has a wide range of help pages and a quick search of the Internet will usually supply the required information.

Making small metal boxes

The gentle art of 'chassis-bashing' for the computer generation

Tools for scribing a circle.

INTRODUCTION. Metalworking – 'chassis bashing' – isn't that difficult if you take a methodical approach and have a few of the right tools. In the first of two articles we look as the basics of making your own custom enclosure.

THE DESIGN. The first thing that needs to be considered is the layout of components and/or PCBs that your box will contain. In short, consider what needs to go where.

Are other pieces of metalwork required within the case, such as RF shielding? Perhaps heatsinks, or a fan or two? All these will take up space and require mounting. Another important consideration is to keep leads carrying RF signals as short as possible. This will affect where you place components or circuit boards inside the case and, subsequently, its design.

Collect all the larger components that are to be mounted in the case (eg meters, knobs, switches, indicators, plugs, sockets, transformers, fans, heatsinks, etc) and place them on a piece of paper roughly in the positions they will be inside the case. This paper forms a sort of dummy chassis.

Once this has been done, mark the 'best' positions of the components on the paper and, using a rule or a tape measure, measure and mark on the paper the distances from centre-to-centre of each adjacent component and other dimensions that you think will be useful. This will give you a plan to follow when it comes actually making the case/chassis.

While functionality of controls and indicators comes first, aim to make the front panel as attractive as possible. For example, with rotary switches and controls, make sure there is room so the person operating them can get their fingers comfortably around them – and leave sufficient space for labels. Try to group controls and indicators by function, eg put a receiver's RF and AF gain controls together.

MARKING OUT. You'll need a straight-edge, a 30cm/12 inch rule, an engineer's square and a scribe, awl or pointed knife to do your marking out. These can be obtained at a hardware shop or online. An engineer's square, even a cheap one, might come with a small scribe (small pointed tool for marking out) in the handle. It will double as a straight-edge, depth gauge, marking gauge and 45° bevel – all of which are very useful in metalwork. Incidentally, folding an A4 sheet of paper in half will give you a 90° angle that you can use for marking out - and folding the 90° angle in half will give you a 45° angle if you don't have a bevel or protractor handy.

Transfer the information on your plan/layout sheet to the metal sheet from which you are going to make your case/part of the case. First, scribe the outside lines/outlines of the case/panel, starting from a square corner. By scribe, I mean to use a pointed marking tool, such as a scribe or an awl, to mark out the physical shape/outline of the case/panel you are making.

Next, scribe the 'folding lines' – the lines where you intend to make a fold in the case. As it can be easy to confuse an unwanted scratch with your desired mark-out lines, draw a small circle around any centre points where you intend to drill a hole. Drilling and folding are described later.

To scribe circles you can use a pair of dividers or draw around a tin, a lid, a cup or anything at hand that is circular and close in size to the required diameter. You can also use a school drawing compass.

There is an old saying: "Measure once cut twice, measure twice cut once." What this means is that if you just measure something once and don't check to make sure the dimensions are correct you may end up making a second cut – on a second piece of metal…

STRAIGHT CUTTING. A guillotine is best for cutting sheet metal. If you have one you'll know how to use it. Operating it alone greatly reduces the chance of inadvertent amputation. Talking with your friends/children/wife/husband while guillotining metal is a good way to accidentally lose a finger.

Alternatively, a bandsaw with a general-purpose woodworking blade will easily cut aluminium sheet (and PCBs) but don't use it on steel. A jigsaw with a hollow-ground woodworking blade will cut aluminium smoothly if lubricated with thin spray-on oil like WD40. Make sure that you hold the aluminium firmly, as it will probably be thinner than the tooth-to-tooth distance of the saw blade and will readily 'snatch' (move sharply when the blade is moved).

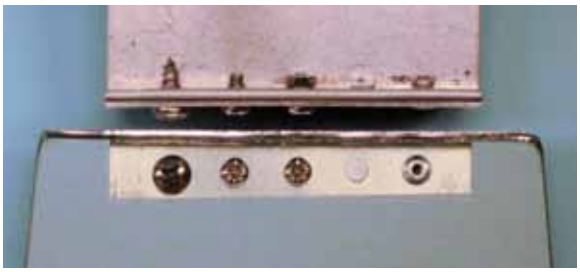
When cutting, carefully follow the scribed line. Two parallel lines, a saw's cut apart (a kerf width, as the professionals say) will make it easier. Once you have finished cutting a line, finish off the cut with a file or sandpaper on a block of wood, so it is smooth and splinter-free.

Another way of cutting a line is to use a pair of tin-snips, preferably of the higher quality aviation type. You can cut right across a wide sheet of thin metal without distorting it by alternately snipping with left and right aviation snips along two scored lines about 12mm apart. Pull out the 12mm-wide waste strip with pliers as you cut; snip it off if it gets in the way of your cutting. Duct snips (which have three blades) will do the same job with less waste (4mm) but are expensive and may jam (mine do).

A nibbler – either a manual one or a drill attachment – will cut straight lines and curves, but leaves a pattern that looks wobbly. This will be of no consequence if the cut made by the nibbler is covered by a panel meter

or another flanged component.

A cheap but tedious method of cutting aluminium is to scribe the cutting line on both sides of the sheet and continue scoring along the line using a tile cutter (or anything with a hard, sharp point) until it's deep enough that the metal will 'snap' along the scored line. Clean up the edges with a flat file – draw-filing works well. To do this, hold the edge of the sheet in a vice. Even a small clamp-on vice will serve, but protect the sheet (and the kitchen table-top) with card or cloth. Place the middle of the file on the rough edge of the chassis, hold the blade of the file with a hand on each side and pull or push from one end to the other.



Different types of fastening. From left to right, self-tapping screw, screw for threaded hole, nut and bolt, flush rivet and pop rivet.

CUTTING CURVES. First, mark and centre-punch the centre point for scribing the curve. If this centre-punch mark is going to be in a place where it will later show, clamp or otherwise temporarily fix a piece of scrap aluminium to the chassis/case to take this mark.

Trace the curve with a pair of dividers, a compass or even a clamped pair of scissors. If you are going to cut the curved hole with a nibbler, drill an access hole just inside the circumference of the curve.

Large square and round holes can be made fairly quickly by marking the perimeter and then drilling a line of almost-touching small holes right around the inside of the perimeter. To join the holes, cut between them with a pair of snips or side-cutters and wriggle the resulting waste piece out. Clean up the resulting (ugly) hole with a half-round or flat file, as appropriate.

For shallow curves, angle the file to more-or-less fit the curve. Smooth and finish the edge with sandpaper, steel wool or a small, sharp knife.

Left and right aviation snips make quick work of larger holes and are excellent for outside curves. To snip a hole, you'll first need to drill an access hole so you can start snipping.

In order not to distort the edge of the curve or larger hole, first roughly trim out the waste metal and then carefully snip off the last few millimetres of the waste all around the hole, right on the scribed line.

I usually make all the large holes (for meters and fans) after doing whatever folding needs to be done to the case/chassis/panel, as large holes can make it difficult to obtain a clean, uniform fold, especially if they occur close to the folding line.

When making holes for meters with embedded mounting bolts, cut the hole first, then mark the positions for the bolt holes and drill them.

DRILLING HOLES. Always use a centre-punch in combination with a small hammer to punch the marked position for a hole to lessen the likelihood of the drill bit wandering.

For holes greater than about 6mm in diameter, first drill a smaller 'pilot' hole. For drill bits over about 9mm make sure you secure the chassis/case/panel that you are drilling using a vice, clamps or similar – you don't want the workpiece coming around at you with the force of the drill.

To avoid a burr forming as the drill breaks through the back of a hole, clamp or hold a flat scrap piece of hardwood or ply hard against the underside. If you keep the wood in place by hand, do not have any part of your hand in line with the drill.

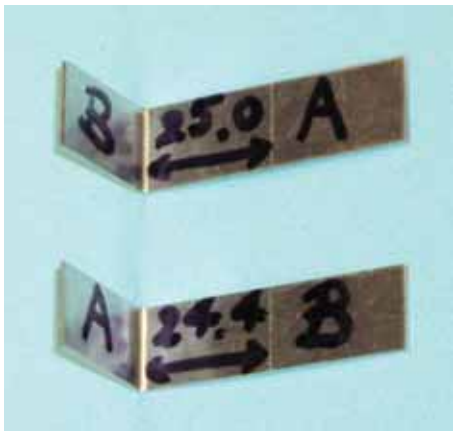
To remove any sharp metal from the edge of a small drilled hole, I use a much larger drill and rotate it by hand in the hole until the sharp bits of metal (often referred to as swarf) fall away. Do not use a power drill to get rid of the swarf; you may end up with a much larger hole than you really wanted. Of course, a countersinking drill bit will also do this kind of job well, but must be sharp or it will burr the edge of the hole.

BENDING. When sheet metal is folded, it is stretched around the outside of the fold and compressed on the inside. The result is that side being folded (but not the clamped side) is shortened by an amount of approximately half the thickness of the metal. To check this amount, take a scrap of the metal, mark three lines (say 25mm apart), clamp on the middle line in a vice, fold the projecting piece 90° and measure the shortening. Repeat the process and take an average.

Another important step is to make a note of which side of the piece of sheet metal that you will hold in the vice when you come to make a fold. This is because if you make the bend in the wrong direction/from the wrong side, you're likely to snap the sheet when you try to unbend and re-bend the metal.

A sheet metal folder helps to quickly make neat and accurate folds in aluminium up to 1mm thick and up to about 300mm long. You can make your own with a using a vice, a clamp and two stiff pieces of metal. I use two 300mm pieces of 3 x 25 x 25mm angle iron.

After you have sorted out your folding apparatus, decide which side of the scribed line that you will bend the sheet/panel/chassis/case. Place the 'arris' of one piece of angle



Shortening can occur when you bend toward or away from a scribed line. A is the part of metal you clamp, while B is the part that is folded up. The top piece of metal shows what happens when the bending process is carried out successfully (25mm), while the bottom piece is an unsuccessful attempt (24.4mm).

iron on the scribed line, the second piece of angle iron behind the sheet and close to the scribed line. Secure one end of this folding aid in a vice and the other with a clamp. This is one of those jobs where you may need a third hand – find someone to help you. Now, adjust as necessary so the scribed line is just visible. To do this, I usually tap the piece of metal lightly with a small hammer, until the scribed line is in the right place.

Tighten the vice and clamp. With a flat piece of wood, push the free side of the sheet over the angle iron on the scribed side. If the sheet looks like bending rather than folding neatly along the line, place the edge of a piece of hardwood at the fold and repeatedly strike this with a large hammer, to make a neat, crisp crease rather than a bend.

For longer folds, strike near one end of the piece of hardwood, then at its centre, then at the other end, then in the centre again, and so on. Finally, flatten at 90° along the fold using light strokes of a small mallet or hammer. A small mallet made of wood or polycarbonate is preferable to a hammer, as it leaves fewer marks on the sheet/panel/chassis/case. A large hammer will try to push everything away – a small hammer is better for local deformation.

If you are making a small box, the sides can be formed around a block of hardwood or dense ply. Make sure this 'pattern' block is square and the exact inside size of the box you wish to form.

RIGHT-ANGLED ALUMINIUM – WITHOUT BENDING. No, it's not magic. Simply join two pieces of aluminium sheet together using 10mm or 12mm aluminium angle. This is easily cut with a hacksaw at 90° or 45° and filed smooth. The pieces of sheet can be fastened to the aluminium angle with rivets, pop rivets, self-tapping or machine screws.

Pieces of sheet can also be glued to

Draw filing.

Cutting a round hole by using a series of drilled holes.

aluminium angle with epoxy resin. To do this, first roughen the surfaces and clean the surfaces to be joined. Use the high-strength epoxy glue - not the five-minute variety as the joint will be too weak in my experience.

FASTENERS. Use screws for joints that will or might need to come apart. Self-tapping screws and machine screws (bolts) that are screwed/threaded into thin aluminium will very easily strip the thread. However, they are quite satisfactory if used in aluminium that is at least 2mm thick and are always carefully tightened.

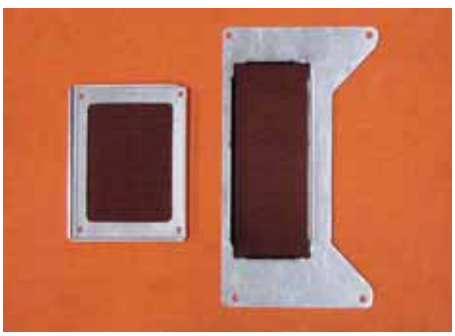
Thread aluminium with great care – it easily strips. Drill the hole one or two sizes smaller than the screw that you want to use. 'Guesstimate' the size by holding a drill shaft on the thread of the tap you are going to use to put a thread in the hole. The shaft should just cover the bottom of the thread.

Now lubricate the tap and/or hole with thin oil. Hold the tap in a hand drill or variable speed/reversible cordless drill. Both of these allow you to 'feel your way' when tapping the hole. Don't let the tap wobble around or you are likely to strip the thread. Stop the tapping process when you feel an increase in resistance and back out. Clear swarf from the tap and continue with care.

It is a good idea to practice tapping a hole first on a piece of scrap. You'll soon get the hang of it and make threaded holes with confidence.

If you accidentally strip a thread, the options are to use a larger bolt, a self-tapping screw, or clear the hole and use a bolt and nut. This nut may need to be glued or held in position if it's in a closed box.

Solid aluminium rivets are not very common these days, but can be made from scraps of high-voltage aluminium power line (try a scrap metal yard for suitable material). Rivets of this kind can be 'tapped' flush into a countersunk hole and provide a completely flat surface.



Two ways of cutting a vent in a panel.

Pop rivets make a simple, quick and neat 'permanent' joint but can always be drilled out if necessary. Only use aluminium or stainless steel pop rivets. When pop-riveting I drill all the holes for the rivets in the top piece and then just one at each end of the bottom piece. Pop-rivets placed through just these two end holes will 'locate' the position of the rest of the rivets without the need to mark out any more holes in the second bottom piece that is being riveted. Make sure that the first two pairs of rivet holes are right. If one (or both – shock horror) are misplaced/misaligned, drill the other holes with more care, rivet them and then run the drill through the original misaligned holes before riveting them.

VENTILATION. For natural airflow to remove heat produced inside your box, you'll need low-sited intake and high-sited exhaust holes of a fair size. Even with a fan to help the ventilation along, the inlet and outlet holes should be located with care. An air intake can be underneath a box/chassis/case as long as the latter has feet and these are tall enough to allow adequate airflow.

If a particularly heat-sensitive component will be mounted in the box, try to direct air from the intake over it. Have the exhaust hole closest to the bits that are generating the most heat (eg RF output semiconductors and their associated heat sinks).

A coarse wire mesh or grille over a fan or intake/exhaust holes will keep out human fingers, mice and macro-fauna generally but insects and dust require something finer. I have used household fly-screening, speaker grilles from junked radios and the excellent RF screen mesh from microwave oven doors (it's an effort to get this out – a metal guillotine helps). 'Expanded' aluminium sheet is effective.

Fine mesh can be stiffened enough to be self-supporting if it is shaped into a shallow tray. Form the tray-shape using a small block of ply or other wood as a pattern. Softer mesh can be glued to a small 'tray' of flat aluminium with its centre removed after folding up the sides.

You could simply drill an array of holes to provide ventilation. Be accurate with your marking out, punching and drilling or it will look decidedly unprofessional.

SAFETY. One good way to think about safety when carrying out a process is to think along the lines of 'what will happen if this goes wrong?...'

Most safety rules when carrying out metalwork are common sense but here are just a few pointers to keep you out of trouble.

- As a drill breaks through the bottom of a hole it may grip and try to rotate the workpiece. Don't let it happen. Firmly hold the piece of metal you are working on and keep the drilling rate constant, especially when near the point of 'break-through'.
- The smaller the piece of metal being drilled, the more securely it needs to be held. Locking pliers or a vice should always be used to hold small bits of metal being drilled.
- Slip-joint clamps are useful to hold things in place, but do not use them in any situation where there may be vibration or an impact as they easily loosen.
- If you use scrap wood as a backing behind the object being drilled, this backing should also be secured so it doesn't catch and spin.
- Don't have any part of your body (or anyone else's) in line with a drill when it is in use.
- Wear safety goggles or a visor when drilling or grinding or doing anything in the workshop when bits of metal might fly around.
- Only blow swarf out of a chassis when wearing safety goggles or a visor or after closing your eyes. If you don't, painful punishment will follow the crime so swiftly you'll never forget it or do it again.
- Be careful with power cords; don't trip over or drill through them.
- Clean up as you go, so you never have a dangerous accumulation of work pieces, off-cuts, tools and unconnected paraphernalia on the bench.

REFERENCE

[1] *Radio Communication Handbook*, 10th Edition, edited by Mike Dennison, G3XDV and John Fielding, ZS5JF. RSGB, 2009.

LAM COMMUNICATIONS

The North's Leading Radio Emporium

52 Sheffield Road, Hoyland Common, Barnsley, S74 0DQ, South Yorkshire

www.lamcommunications.net

sales@lamcommunications.net

New Sales Hot Line 01226 351037

Tel : 01226 361700

Check Our website for more up-to-date and keener Prices!

Check Our website for more up-to-date and keener Prices!

WE ARE MAIL-ORDER SPECIALISTS for all of the UK- EU

Tracked FedEx

The NEW APRS handy from Kenwood is almost here... Reserve yours at LAMCO NOW!

USED EQUIPMENT

See **"NEWS"** page on our website.

12 Months warranty unless otherwise stated.

USED EQUIPMENT

HF- VHF- UHF- D Star LAMCO's have all ICOM Rigs in Stock CALL NOW

ICOM Authorised Dealer

IC-7800 Flagship HF 160-6M Dual Receiver base station @ **£7995.95**

IC-7700 Single receiver version of the 7800 HF160-6M, Free SM20 desk mic @ **£5499.95**

IC-7600 HF160-6M 100w base or portable, All mode, RTTY-PSK without a PC, USB, Wide Screen display @ **£CALL**

IC-7200 HF160-6M 100w base or portable @ **£799.95**

IC-718 HF160-10M @ **£519.95**

IC-910H 2m/70cm Base @ **£1269.95**

IC-910HX 2m/70cm Base including 23cm module @ **£1469.95**

IC-7000 HF160-6M+2m/70cm@ **£1079.95**

IC-2820 50W VHF-UHF, D-Star complete @ **£579.95**

IC-V80E 2m handheld 5W @ **£119.95**

IC-T70E dual band VHF-UHF handheld 5 watts @ **£179.95**

Icom PS-125 25 Amp PSU @ **£319.95**

ANTENNA TUNERS

MyDEL

MyDEL CG3000 ATU @ **£285.95**

1.8 - 30 Mhz minimum wire length 8 meters, 10 - 200W PEP, SWR: <2:1, 12V Auto tuning 2 sec (1st tune).>1 sec to memory 200 Memorys Remote switch optional @ **£ 39.99**

CG5000MKII 500W as above @ **£559.95**

LDG ELECTRONICS

Z100 Plus 100W auto ATU160-6m @ **£143.95**

AT100PRO 100 W 160-6m @ **£194.95**

AT200PRO 200 W 160-6m @ **£214.95**

Z-11PRO2 portable QRP100 watts ATU @ **£159.95**

IT100 (AT7000) for the Icom IC7000 rig @ **£153.95**

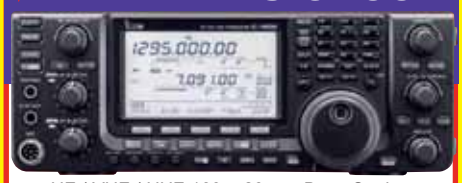
AT897 100 watts 160-6m @ **£183.95**

MFJ

A range of MFJ products catered for!..... Call LAMCO for availability

Superfast "Next Day Delivery" On all orders placed before 2pm

THE NEW IC-9100



HF / VHF / UHF 160m-23cms Base Station

Arriving Soon - be the first to own this new Rig ORDER YOURS NOW!

GO DIGITAL

Future proof your next 2 & 70 radio purchase with ICOM

All these radios have exceptional analogue capabilities to use on your existing local repeaters, add the Digital module and you enter another world, the future is here! Digital Voice & global positioning on the D-Star network when it comes to your area.

IC-2820 D-Star and GPS compatible, inc UT-123 digital board and GPS antenna @ **£579.99**

IC-2820 "XB" **D-Star Complete** This model has cross band Repeater enabled for analogue use. D-Star and GPS compatible, inc UT-123 digital board and GPS antenna @ **£599.95**

IC-E92D waterproof dual band VHF-UHF handheld @ **£369.95**

HK-175GPS speaker-mic @ **£229.95**

shown here with the optional HK-175GPS speaker-mic

IC-E880D 50W dual band Mobile, detactable head unit, Small but powerfull, @ **£439.95**

IC-E80D 5W Dual band handheld wideband RX, Rugged, Water Resistant @ **£329.95**

ALINCO

DX-SR8 New HF Transciever 1-34MHz 100w All mode @ **£539.95**

DIAMOND ANTENNA

Diamond Antennas Famous for Quality

LAM stock a Comprehensive Range

Call for Our Best Price ££££

bhi Products

NES 10-2 MKII Noise eliminating speaker @ **£99.99**

NEIM 1031 DSP Inline Module@ **£139.99**

ANEM 10-2 MKII Amplified Noise cancelling module @ **£99.99**

RADIO MATE Compact Keyboard for the FT817, FT857, FT897 @ **£99.99**

VISA MasterCard SWITCH Maestro PayPal

KENWOOD

Listen to the Future

New TS590 HF Rig coming soon Order Yours from LAMCO NOW!

TS-2000 HF/50/145/430Mhz Free HS5 Headphones @ **£1444.95**

TS-2000X HF/50/145/430Mhz with the 23cm module fitted @ **£1689.95**

TS-480 SAT HF/6 100 watts, includes ATU @ **£739.95**

TS-480 HX HF/6 200Watt High power version, No ATU @ **£839.95**

TM-D710E 145/430Mhz, 50 watts, APRS ready with built in TNC, EchoLink ready @ **£439.95**

TM-V71E 145/430Mhz Dual bander, 50watts, wide band receive @ **£294.95**

THF-7E 145/430Mhz Handheld Wide band receive inc SSB @ **£234.95**

YAESU

Choice of the World's top DX'ers

FT-950 HF 160-10 + 6M All modes, 100 Watts, DSP @ **£CALL**

FT-450AT HF 160-10 + 6M All modes,100W, DSP including internal ATU @ **£CALL**

FT-897D HF 160-10 + 6M All modes, 100 Watts @ **£CALL**

FT-857D HF/50/145/430Mhz @ **£CALL**

FT-817ND the ultimate portable rig HF/50 145/430MHZ all mode QRP @ **£CALL**

FT-8900R 10/6/2/70 dual receive + DTMF 50watts @ **£CALL**

FT-7900E 145/430 mobile @ **£CALL**

FT-1900 145 Mobile 75w @ **£CALL**

FlexRadio Systems

Software Defined Radios

FlexRadio 3000 SDR HF & 6m, Just add your own PC, **available now @ £1399.95**

junksale.co.uk -Buy-Sell-Exchange-Wanted-

All prices quoted @ 17.5% VAT E&OE

Fantastic & Fearsome Flannan Isles

Putting a remote Island on the Air

The Flannan Island team L – R: Simon, IZ7ATN, Christian, EA3NT, Vincent, F4BKV, Col, MM0NDX, Bjorn, SM0MDG and Jorge, EA2TA Photo by Jorge Moreno Laiz, EA2TA.

IOTA DXPEDITION. The first seeds of an expedition to a remote IOTA were planted in early August 2009. One month prior I had visited St Kilda (EU-059) intending to activate that particular rare island group during the IOTA contest. Unfortunately poor weather and sea state thwarted my efforts to remain there during the contest weekend; I spent only a few hours on St Kilda then returned home. A few weeks later and in conversation with another IOTA activator the words 'Flannan' and 'Expedition' were first uttered together.

Christian, EA3NT and I had longed to form a team to activate a rare IOTA. Indeed, in 2007 we seriously considered Rockall EU-189, but soon realised the enormous effort and danger involved in this. We looked at many islands and options within the Scottish (GM) coastline and eventually decided Flannan Isles (EU-118) was worth the effort. Checking various most wanted IOTA listings, it confirmed Flannan was in demand, especially in Japan.

By November 2009, the callsign MS0INT was issued. (This callsign will be used for future rare Scottish IOTA activations). A Google group was formed and all kinds of relevant info detailing the Flannan Isles soon appeared, we learned very quickly the history of the place and just how impressive an Island group it is. If you like white sand beach islands, then EU-118 is not for you!

By the end of 2009, our team was formed. All were seasoned IOTA activators; we felt the group was as strong as it possibly could be. Vincent, F4BKV, Simon, IZ7ATN, Bjorn, SM0MDG, Christian, EA3NT, George, EA2TA and Col, MM0NDX. Between us, over 100 IOTA activated. Our QSL manager would be Tim, M0URX with Nico, DD1MAT being webmaster. Things were taking shape and the excitement rolled on.

PREPARATION. Planning and organising an expedition to EU-118 is time consuming and costly, albeit worthwhile. We had booked our boat charter way back in October 2009, some eight months before we would leave for Flannan Isles. Due to the fact our team consisted of six, accommodation and transport was required. A 12 seat minibus was hired and our base camp on the west side of Isle of Lewis (EU-010) was situated just two miles from our boat charter; a perfect location. We would use the base prior to and after the expedition.

HELP FROM MANY. February to late May 2010 was constant planning, logistics and organising. A monumental effort was given to this. We considered everything from how many litres of water we would need to what type of generators would work best to power the three stations. Norman, GM4KGK based in Stornoway, Isle of Lewis was a huge help in locally sourcing various items we required to make the expedition a success. Ant, MW0JZE very kindly loaned us a G3TXQ Hexbeam. Icom UK supplied us with two IC-7000 transceivers and Alloa Hire Centre (AHC) provided 2kW generators to charge our battery banks. GDXF and CDXC (Clipperton) provided cash support. Donations came in from all corners of the world too. These would greatly help offset costs incurred. Even the guesthouse at our base camp stored hundreds of kilos of gear ahead of our arrival, thus saving us flying into the Western Isles with literally tons of kit.

Tuesday 15 June was when the MS0INT story really began! That evening Christian, EA3NT and George, EA2TA arrived at Edinburgh airport. We kept a close eye on recent weather conditions/forecasts and decided we had a great chance of pulling this off as the weather looked unusually good out in the North Atlantic for the foreseeable future! By next day, the entire team met at Edinburgh and off we set to Stornoway, full of optimism. On arrival at Stornoway airport we met Norman, GM4KGK. He handed over all our 'goodies' purchased locally – the least we could do was treat him to fish & chips! Next stop was the local supermarket. Six guys buying food for three days camping on a remote island is quite a sight to see! By late evening, we travelled from east to west across the Isle of Lewis on mostly single track road. The surrounding terrain resembled a moonscape! Soon we arrived at the guesthouse, settled in, checked all our equipment had arrived and fell asleep exhausted.

ASSEMBLE AND EXPERIMENT. The G3TXQ Hexbeam worked very well in testing and we were confident in erecting it on the Flannans. (This is testament to MW0JZE's instructions). Soon MM/IZ7ATN, MM/F4BKV & MM/EA2TA

Bjorn operating CW. Photo by Bjorn Mohr, SM0MDG.

had pileups as it seemed the waiting world knew our next stop would hopefully be EU-118.

Friday was a truly beautiful day. Clear skies and a gentle breeze. Perfect for a sailing out into the Atlantic. We left our mooring at 0900 and soon Sea Trek boat charter had us on the high seas looking for basking sharks – we saw one or two. After 90 minutes at sea, from the distance the Flannan Isles appeared. At first glance they looked tiny, but then they grew… and grew…

Vincent, F4BKV operating SSB. Photo by Bjorn Mohr, SM0MDG.

QSL Card. The photo of Eilean Mor used on the QSL card was courtesy of Calum MacAulay .

On approach, Eilean Mor (the main island with the lighthouse) made us feel tiny! Our skipper, Ian, surveyed the best landing site and opted for the slightly 'easier' east landing as we had a good amount of equipment that needed hauled up by rope onto a platform just above this particular landing site. We anchored and then, two at a time on a small hard Zodiac, we headed for the east landing. Once we all landed, we breathed a huge sigh of relief and immediately got to work in hauling up all our gear from the Zodiac to the platform.

The steps at the east landing are not in good condition, although considerably better than the west side! One small slip could have been fatal so we really had to be aware when we ascended. As we climbed further, the steps were in better condition. The climb itself is steep and tiring. It takes 45 minutes from landing to reach the island lighthouse, some 88m (264ft) in height. We had to do this trip three or four times with heavy equipment, food, water and outdoor gear all hoisted on our backs.

We quickly realised the lighthouse was a perfect base, the take off for all antennas was ideal. The area below the solar panels of the lighthouse would be our 'shack'. Three lightweight tarpaulins were used to provide a waterproof shelter/roof. The remains of an old outhouse building next to the lighthouse was our cooking area and near to the ruined chapel we pitched tents. The Hexbeam was the first antenna to be erected. We decided not to begin operations on three bands simultaneously as the main target was to give out as many QSOs as quickly as possible. To wait until all stations were complete would waste valuable 'on air' time.

ON THE AIR. Shortly after 1630 local on Friday 18 June, Christian, EA3NT was first to transmit on 14260MHz. "CQ, CQ, MS0INT, EU-118 Flannan Isles". Instantly, Ukraine was first to make the log, followed by JA8MS. Within one minute, and being spotted on the DX Cluster, the pileup was (as we expected) huge! The first 100 stations were logged in no time. By end of day, two stations were on air, and we quickly made 2000 QSOs. The opening to Japan on 20m was particularly pleasing as we knew how much EU-118 was needed there.

CW OPS WERE EA3NT & SM0MDG. A special mention to them for working through the following nights as the SSB camp slept! By Saturday morning we had two HF stations and 6m on air. Pileups were impressive and we noted how well behaved/controlled the callers were. Deliberate QRM appeared non-existent, which was pleasing to say the least. By end of Saturday, 4000 QSOs in just over 24 hours were made. We were delighted. However, by late Saturday afternoon, poor weather approached. A party from the Hebridean Book Trust were due to visit and land the Flannan Isles on the Saturday. Sadly for them the sea state was too rough to land. For us, we knew that landing on the islands at all was lucky – to depart three days later without any issues would be exceedingly lucky!

WEATHER PROBLEMS. Sunday, 20 June was a difficult day, weather-wise. The wind was blowing from the north making it feel nothing like summer! The rain and low level cloud added to an already miserable weather day. Coupled with this, the seas were far choppier than previous days, and I didn't think we would get off the island on Monday morning, such was the change in conditions. Of course we couldn't do anything about this, so continued to operate 24/7. 10m was going great guns on Sunday. The whole of Europe seemed like they were calling in. Split operation was a necessity until the pileup eased a little.

Other bands continued to impress, with JA being worked easily on 17, 20 and 30m. By end Sunday, we erected the 80m dipole as we knew some ops needed EU-118 on this band for an all time new one. Propagation was not good on 80m as daylight never really left us – but we soldiered on and made around 100 QSOs on a seemingly dead band. After midnight on Sunday, we continued to run 3 stations and with contacts being worked so very quickly, the QSO count reached 7000 in 55 hours of operating.

In the early hours of Monday morning, 30 and 40m were still going well. A few hours later, all three stations were back on air and 20m had a pileup that resembled the start of MS0INT operations three days earlier. Sadly, we had to take two stations off air at 0800 on Monday morning as the boat was coming. We kept 20m SSB going until the last minute.

BACK DOWN THE STEPS. Once packed up, we had to carry all gear back down the steep descent of Eilean Mor. This was no fun as we learned we would not be using the platform used to haul the equipment up on arrival. We would need to use the broken steps at the bottom of the east landing, as our return boat was a RIB (we used motor vessel *Lochlann* on the outward journey). George, EA2TA was the mainstay of this operation as we passed gear down to him, who in turn passed it onto Bjorn who was already on the RIB. Suffice to say, a little bit of the Atlantic soaked George as the swell picked up!

Finally at 1105UTC on 21 June we left EU-118. A total of 8,273 QSOs were made in 66 hours; of those, 5,661 were unique callsigns.

THANKS. The team would like to thank everyone who called in, no matter how many times you made the log. Every QSO was welcome and we're delighted EU-118 is now so much less wanted, particularly for Japan. Special thanks to CDXC (Clipperton), GDXF, F5CWU for the loan of band pass filters, Norman, GM4KGK for local support, Niko, DD1MAT for maintaining and updating our website, AHC, SeaTrek, Icom UK and everyone who kindly donated. We also acknowledge the sea gods were with us!

QSL cards are available from Tim, M0URX and planning for our next trip has already started.

WEBSEARCH
www.ms0int.com

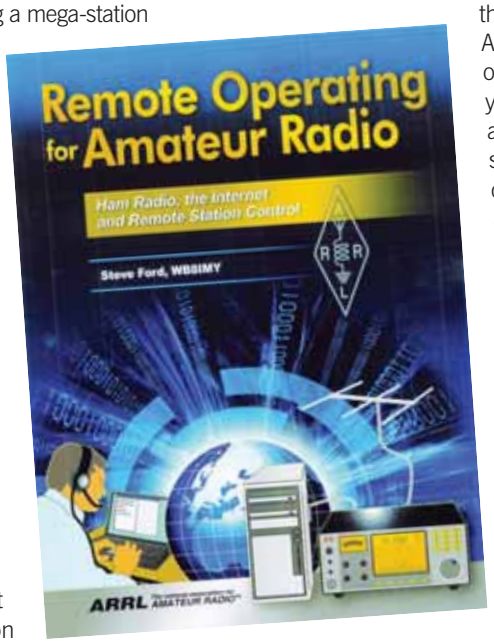
Book review

A bumper selection of excellence this month

Remote Operating for Amateur Radio

by Steve Ford, WB8IMY

Remote operating has become a hot topic of debate in some circles. Is it fair to still call yourself Gxxxx if you're sat at home, remotely operating a mega-station on top of a mountain somewhere? Or, conversely, are you 'truly' DX, and should you be operating on a 'local' callsign relevant to the station location? Whatever the niceties, remote operation is here to stay. But how do you actually go about doing it?



The clue is in the book's subtitle, Ham Radio, the Internet and Remote Station Control. It contains pretty much everything you need to know about the various different ways you can control a complete amateur radio station at a remote location. Of course, it's not just a matter of getting the PTT there and the audio both ways. A proper remotely operated station lets you control your radio as though you were sitting next to it, able to change band, frequency and mode at will. And how about switching aerials? Controlling your rotator? All of these things and more are covered.

There are very few specific recommendations within the book. On the one hand this can be frustrating: you definitely don't get spoonfed a line like "the ideal system is a KenCoCom 3 rig with Deluxe Radio 7 software and a Wassamatta diagnostic interface". Instead, once you have read this book you'll have a good understanding of all the aspects involved so you can intelligently specify and choose your equipment and solutions. For instance, many people use Skype to run audio to and from the remote radio via the internet, but there are other options too – how about using a good old-fashioned telephone? Audio bandwidth is OK and you don't get any of the latency issues inherent with voice over IP (internet). If you have an all-calls-free phone tariff but a limited amount of data on your broadband contract, this could be the way to go. I wouldn't have thought of it, though, without reading the book.

I thought this was quite a thought-provoking book that gave me a lot of insight into the problems and possibilities of remotely operating a station. I live in a suburban area but have relatives out in the open country, so I may even give remote operation a go myself.

ISBN 978-0-87259-092-2
112 pages, 210 x 275mm
Published by ARRL
Non members' price £19.99
Members' price £16.99

ARRL's PIC Programming for Beginners

by Mark Spencer, WA8SME

When I joined the RSGB 25 years ago the computing landscape was very different from today. Microcontrollers were quite primitive devices, usually mask-programmed so that you had to have thousands the same before it was worthwhile. But in recent times this has changed dramatically with Microchip's introduction of the PIC processor range. These devices share a generally common architecture but range from tiny 6-pin devices to I/O rich 40-pin implementations.

But how do you go about making one of these useful devices do your bidding? You have to write a program, possibly in assembly language. But where do you start? That's where PIC Programming for Beginners comes in. It takes you by the hand and, using a building block approach, shows you everything you need to know to write your first programs.

The thing I liked about the book is the way that it not only tells you about the PIC micros, but also about the (free) tools you need to download in order to be able to work with the devices. The central tool is Microchip's MPLAB integrated development environment (IDE), which is used extensively to write and check software, compile and even emulate it on target processors. Unlike some books that assume a high level of previous knowledge, I thought this one told me everything I'd need to know. If you're not much of a typist, you'll be pleased to know that there's a free supplementary CD that also has data sheets, video files and much more information.

Once you have worked your way through PIC Programming for Beginners you will have a thorough grounding in PIC programming principles and be able to develop your skills on your own. On the way you will have made some interesting projects, ranging from a simple LED blinker to a Morse keyer.

If you have ever wondered how to get started in the wonderful world of PIC programming then this book will suit you down to the ground.

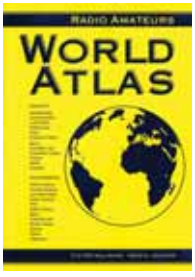
ISBN 978-0-87259-089-2
256 pages, 210 x 275mm
Published by ARRL
Non members' price £32.99
Members' price £28.04

Radio Amateur's Map of the World

Every shack should have one of these. Every country of the world, all the prefixes, CQ Zones and ITU Zones, all in one place for instant reference. Having one of these on your wall not only gives you an excellent aide-memoir, but it is a great talking point for visitors. Fire up the radio, tune in a VK station and simply point to the map – "He's there". Throw in time zones, a comprehensive prefix list plus zoomed-in views of European countries and the Caribbean islands and you have an attractive and unbeatable at-a-glance reference for all your international radio needs.
Available while stocks last.

980mm x 680mm approx
Published by Czech Radio Club
Non members' price £4.99
Members' price £4.29

Radio Amateurs World Atlas



Whilst the Radio Amateur's Map of the World shows everything at a single glance, there will always be a place for a more detailed publication that shows call areas and geography with a greater degree of finesse. This is where the Radio Amateurs World Atlas comes in. Its colour pages show countries and regions of the world in a variety of projections for minimal distortion of land areas. Amateur prefixes are located by their appropriate region (with boundaries) so, for example, you can clearly differentiate between, say, the VE3 and VE4 areas of Canada. In addition there are also political (country) and DX Zone boundaries.

16 pages, 210 x 297mm approx
Published by DARC
Non members' price £9.99
Members' price £8.49

Homebrew Cookbook

by Eamon Skelton, EI9GQ

One of the privileges of being *RadCom*'s Technical Editor is that I get to read everything *first*. Every month brings a new instalment of the experiments at Skelton Towers, as EI9GQ delivers his latest Homebrew. Now, *RadCom* Editor Elaine Richards has taken the first two years' worth of his columns and re-arranged them by theme, which works well in book form. A monthly column sometimes has to mention subjects only lightly in passing, returning to them later for coverage in more depth. The genius of this book is that everything has been laid out so that there is constant coverage with no flipping backwards and forwards. It is so much more than a simple reprint of the Homebrew column.

The book has sensibly been broken down into five general subject areas: construction methods, building a receiver, frequency measurement, transmitter & receiver projects and aerials. Regular readers will know that Eamon takes a very down-to-earth approach to all his work, always finding inexpensive, simple and low-stress ways of achieving his aims. This is well demonstrated throughout the Cookbook where, time and again, you get those little hints to make things easy. For instance, wherever possible Eamon tends to use 1mm copper wire when winding coils. Why? Because that's the diameter of the centre core of 75Ω TV coax and most amateurs probably have some offcuts lying around. And, similarly, other components are often ones that may be lying around – or purchased cheaply – with alternatives also listed so that substitutions are easy.

The construction methods chapter takes you right through all the main techniques from dead-bug layouts through to dedicated printed circuit designs. The PCB section is packed with simple ideas that will allow you to make your own boards cheaply and easily without any specialist equipment. He even shows you how to use sunshine or cheap halogen security lights as a UV source! These suggestions contain all you need to know, including typical exposure timings for different UV sources.

All of the designs and projects are accessible and eminently buildable and down to earth. You don't generally need any test equipment other than perhaps a multimeter; on the occasions that something else is required then Eamon will often show you how to build what you need for yourself. Projects include a simple direct conversion receiver followed by a more sophisticated superhet. On the transmit side, *Homebrew Cookbook* includes an SSB transmitter, PA and a VHF transverter. All the designs are modular, making it very easy to extract sections for other uses. In addition to describing these practical designs, Eamon explains the design process in plain language which makes it very easy to adapt these basic designs. A good example is the way in which he describes the construction of a crystal filter using surplus crystals. A range of ingenious techniques are employed to produce excellent quality filters using easily obtainable components. He even tells you how to make the most of eBay to find what you need.

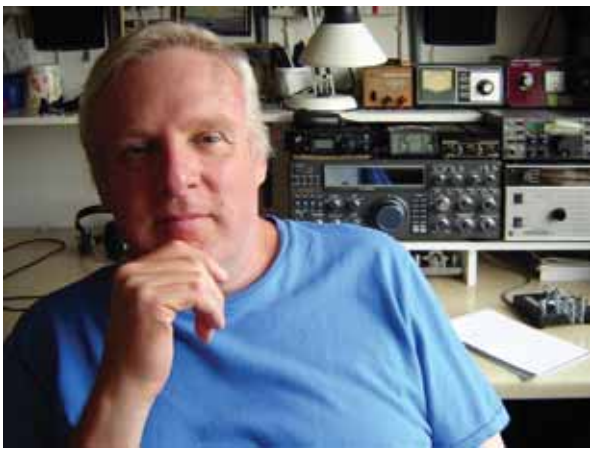
This is all about making homebrew accessible. I particularly like the attitude to the novice constructor. The whole message seems to be, "Don't worry if you don't understand it at first, just build it. Once you *have* built it, it'll make a lot more sense!" Amateur radio is traditionally about self-training in radio and communications and (to paraphrase Nuffield) there is no better way to find out than by doing.

All in all it's a superbly practical book that draws on the fine body of Homebrew work and presents it in a logical, easy-to-follow fashion. It is a fantastic reference with simple, well-proven solutions to many construction problems. If you are considering homebrew – or are already homebrewing – then this book is for you.

ISBN 9781-0-5-8661-0
202 pages, 210 x 275mm
Published by RSGB
Non members' price £12.99
Members' price £11.04

Sport Radio

Sprint contesting and a look forward to 2011



Tim Raven, G4ARI, who was one of last year's winning team in the 80m Club Sprints.

A DIFFERENT SKILL SET. In most contests it is possible for some participants to stake out a frequency and run on it; maybe not for the entire contest, but certainly a large part of it. Sprint contests are very different and require a very different set of skills to do well in them. This month the 2010 series of 80m Club Sprints begins, and you only have to look at the results tables from previous years to see that teams who do well in, say, the 80m Club Championships do not do as well in the Sprints (and vice versa).

The format of the 80m Sprints is pretty-much the same as all sprints – if you call someone and complete the QSO, you are then permitted to call CQ on that frequency and work one more station before you have to QSY. For this reason you don't get anything like the same amount of 'frequency warming' that takes place in most contests, because there's simply no point. Of course there's nothing to stop you from continually hunting for a clear frequency and calling CQ on it, but then you have to QSY after every QSO, so practice dictates that you call someone, work him, then call CQ to make a second QSO. But what if you call a station that hears and then works someone else? Well that's just too bad, the station you wanted now has to QSY and you have to try to find him! Tim Raven, G4ARI, was one of last year's winning team from De Montfort University. Here he gives some tips for successful operation in sprint events.

"Sprint contesting techniques are quite different to that of conventional contests. Often the QRP operators who have traditionally made all or a lot of their QSOs through S&P now find that the skill and techniques they have called upon previously enables them to compete much more competitively with the 100 watt boys, some of whom may be quite unfamiliar with the finer points of S&P!

"In a conventional contest, waiting your turn to work a station who has a pile-up might lose you time, but patience and perseverance will eventually pay off and you will work it. This is not the case in the Sprint contests, because the station calling CQ, who you need to work, will QSY after making the QSO, so if the QSO isn't with you, your target station will no longer be there. Consequently, developing a good technique in calling is very important, because you need to be the first station he hears and goes back to!

"I find that carefully listening to the station that your target station worked to get the frequency can be very worthwhile, because often the station handing over the frequency will end by saying "Your frequency". If your timing is right and you are quick, you may just manage to interject with your callsign after "Your frequency", so the other station doesn't even need to call CQ, but instead can go straight back to you. And then it's your frequency and you also might be lucky and get a quick callsign before you need to call CQ.

"If that doesn't work, then maybe it's still worthwhile listening on the frequency and having a go at calling the new 'owner', especially in the early stages when you will not have worked many stations. And if that doesn't work, try other alternative strategies for maintaining the QSO rate, such as carefully tuning and looking for weaker stations that tend not to attract multiple callers. I take the view that just because a station is weak doesn't necessarily mean he can't hear you; remember that QRP operators often have very good ears! Also don't forget on CW to check the QRS Corral. And finally, if all else fails, you always have the option to find a clear frequency and call CQ.

"On SSB, effective and clear phonetics are very important. Think about making subtle changes to the phonetic alphabet that might help your callsign stand out under noisy band conditions, such as replacing Romeo with Radio and replacing India with Italy. Just say the words and you'll know what I mean. To avoid any uncertainty, consider both saying your name and also spelling it phonetically; it doesn't take long and avoids a multitude of possible pitfalls, such as mixing Jim and Tim or Jon and John." Or Ron!

2011 CONTESTS. It might seem to be a bit soon to look forward to next year, but the Contest Committee has recently finalised its contest calendars for 2011. The list was communicated to contesters via the UK Contesting e-mail reflector in June.

As far as HF events go, there are some significant changes.

1. The 21/28MHz Contest is being dropped. As I reported in this column last December, the demise of this event was likely because of the continued low level of participation, which has remained stubbornly in the 80s since the 21/28MHz CW Contest was merged with the 21/28MHz SSB Contest.
2. RoPoCo 1 is switching from CW to SSB and will be held on a Sunday evening. Although a lot of CW enthusiasts rushed to the event's defence when they heard that this was going to happen, the fact that participation has remained broadly level for ten years – while participation in some other events has rocketed – speaks volumes. My personal thoughts on the new event are that the more sociable time of day (not many people like getting up early on Sundays) and the fact that inter-UK propagation will be better will result in much greater participation. I wouldn't mind betting that 90 minutes will be seen as not long enough.
3. The rules of the 1.8MHz Contests are being changed to permit non-UK to non-UK QSOs to count for points, the intention being to encourage greater participation from non-UK stations. The attraction of working UK stations for Postcodes bonuses is being maintained.

On VHF there is only one change. From next year the 2m Low Power Contest and the 4th 2m Backpackers will be held on the same date, with the 2m Low Power running 0800-1400 UTC and the 4th Backpackers from 1000-1400 UTC. The 70cm Low Power Contest will take place on the day before.

A new initiative that might affect contesters across the spectrum is the starting of an AFS Super League, whereby the scores that clubs make in the 2m AFS Contest in December, in 80m CW AFS and 80m SSB AFS in January, and in 70cm AFS in February will be normalised and combined. The rules of the individual events will remain the same, for now at least.

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Aug 1	RoPoCo 2	0700-0830	CW	3.5	RST + full PC received
Aug 12	80m Club Sprint	1900-2030	CW	3.5	SN + name
Aug 25	80m Club Sprint	1900-2030	SSB	3.5	SN + name

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Aug 3	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Aug 7	144MHz Low Power	1400-2000	All	144	RS(T) + SN + Locator + PC
Aug 8	432MHz Low Power	0800-1200	All	432	RS(T) + SN + Locator + PC
Aug 10	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Aug 15	70MHz Cumulative	1400-1600	All	70	RS(T) + SN + Locator
Aug 17	UHF UKAC	1900-2130	All	1.3/2.3	RS(T) + SN + Locator
Aug 22	4th 2m Backpacker	1100-1500	All	144	RS(T) + SN + Locator + PC
Aug 24	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Aug 31	70MHz UKAC	1900-2130	All	70	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Aug 7	European HF Championship	1200-2359	CW/SSB	1.8-28	RS(T) + yr first licensed (Eu works Eu only)
Aug 14-15	WAE DX CW	0000-2359	CW	3.5-28	RST + SN (Eu works non-Eu only)
Aug 29	IRTS 2m Counties Contest	1300-1500	All	144	RS(T) + SN (EIs & GIs also give county)

For all the RSGB contest information and results, visit www.rsgbcc.org.

PUBLICITY. It is easy to assume that everyone interested in contesting keeps themselves up to date by checking the various websites, subscribing to e-mail reflectors and reading magazines such as *RadCom*, but not everyone who might be interested in dipping their toe in the contesting waters does. To that end the Contest Committee recently took the decision to actively promote RSGB contests to a wider audience. Ed Taylor, GW3SQX, the Chairman of the Committee, picks up the story, saying; "As a Committee, we recognise that we are no longer in the situation where the world will flock to our doors as soon as we announce a contest. We are now in a competitive market, where we need to advertise the events that we offer, both at home and abroad. The Committee has put together a leaflet to promote RSGB contests, which will be distributed at international events such as those in Dayton and Friedrichshafen, as well as domestic rallies and so on." If anyone would like to distribute leaflets amongst the members of a club, they can be obtained by e-mailing AR.Dept@rsgb.org.uk.

The question of publicity was brought into sharp focus recently when I worked someone just ahead of a session of the 80m Club Championships who was under the impression that he was not allowed to take part unless he had given prior notification. Neither did he realise that there is no formal requirement to submit a log (although they are always welcome).

THIS MONTH'S EVENTS. August is not a busy month for RSGB HF contests, but there are nonetheless three 80m events to enjoy. The first is RoPoCo 2, the Sunday morning CW quickie in which you send each QSO partner the postcode you received in your previous contact. The RSGB 80m Club Sprint series begins this month, with the CW leg on the 12th and the SSB leg on the 25th. Work everyone, but remember that once you have made a QSO as the result of calling CQ, you have to vacate the frequency. Remember also that the contest exchange is different for the Club Sprints; being serial number and your name (no signal report).

There are nine RSGB VHF events in August, starting with the 6m UKAC on the 3rd. It's a five Tuesday month, so the other UKACs take place on 10th (70cm), 17th (13/2.3GHz), 24th (2m) and 31st (4m). Over the weekend of 7/8th the Low Power Contests take place. The 2m event lasts for 6 hours on the Saturday and the 70cm 4 hours on the Sunday. In both cases you need to exchange the first two letters of your postcode, in addition to the report, serial number and locator. The final 4m Cumulative of the year takes place on Sunday 15th. There's only a slim chance of Sporadic-E propagation in this one, because it's very late in the season. On the 22nd the 4th 2m Backpacker Contest is one in which you also have to exchange the first two letters of your postcode.

The Slovenian-run European HF Championship is the first non-RSGB contest contest of August that I'd like to highlight. It's a 12-hour event in which Europeans work Europeans only. Exchange a signal report and a two-digit number corresponding to the year in which you were first licensed. There are high and low power sections for CW only, SSB only and mixed modes. The next weekend its pretty much the exact opposite, because in the WAE DX CW Contest European stations work non-Europeans only. Finally, the IRTS 2m Counties Autumn Contest takes place on Sunday 29th. If you're outside EI/GI, work EIs and GIs only, giving them a signal report and serial number. Expect to receive a signal report, serial number and their county. In the 2008 and 2009 running of this contest no entries at all were received from outside of EI, so if a UK station had made just one QSO it would have put him in top spot. That said, if any GIs are active, their proximity to EI means you'll have to do well to beat them.

Would you like to distribute these contest leaflets?

QRP

Buildathon group win award

The solar power pedestrian mobile station run by Dave Starkie, G4AKC.

AWARD. In previous columns I have mentioned Buildathons, events where less experienced radio constructors build projects under the guidance of experienced constructors. The Bath Buildathon group and the DVD they produced were awarded the Kenwood trophy for outstanding contribution to amateur radio training at the RSGB AGM in April. All five of the Bath Buildathon members received certificates of merit: Mike Coombs, G3VTO, Lewis Thomas, G4YTN and Steve, G0FUW (the mentors), Robin Thomson, G3TKF and Julian Baldwin, G3UHK, (the film crew) and Tim Walford, G3PCJ, (kit supplier and 'industry' representative in the DVD). It represented genuine team effort under the leadership of G0FUW. The DVD, which explains how to organise a Buildathon, was intended to encourage radio clubs to pick up their soldering irons and start raising solder smoke. To date, over 60 copies of the DVD have been sent out across the UK and abroad. From the feedback received it appears to be having the desired effect.

The video from the Bath Buildathon DVD can now be viewed online. To watch the video follow these steps: go to www.batc.tv. Click on the 'Film Archive' icon at the top left. Select 'QRP Buildathon' from the drop-down list. Click on the > icon to start the player and click on the icon to the left of the volume control to display the picture full screen. There is a link just under the player to save the video to your computer. Incidentally, you could also choose 'G3RJV QRP Lecture' from the drop-down list for a version of the talk I gave at the Loch Erne Rally earlier this year. These videos are examples of the wide variety of services offered by BATC (British Amateur Television Club) to the amateur radio community. New members are very welcome. Further details of this interesting group can be found at www.batc.org.uk.

THE 'RETRO-75' AM TRANSCEIVER KIT. Dave Benson, K1SWL, of Small Wonder Labs is now offering a rather novel QRP Kit. Well known for kits like the SW series of QRP CW transceivers and Rock-Mite miniature QRP CW transceivers on a 2.0 by 2.5 inch board, Small Wonder Labs now produce an 80 metre AM transceiver board kit called the 'Retro-75'. It is so called because the band we call 80m in the UK is called 75m in the USA.

K1SWL says, "This project is a frankly nostalgic look back at our hobby of 50 years ago. It's now been updated using all modern components. Despite the relative inefficiency of AM as compared to SSB, it just sounds better!" The 'Retro-75' Board size is 3.5" x 5.27" with a varicap-tuned receiver covering 50kHz of the band, with a selectable 4kHz receiver crystal filter and room-filling speaker volume. It uses a crystal-controlled transmitter (3885kHz supplied) with board pads for a remotely switchable second crystal frequency. The transmitter output power is 2.5W carrier/ 8W peak with transmit and receive ALC. The transmitter uses readily-available and inexpensive dynamic microphones. The kit has a built-in alignment function. Outside the USA and Canada the price is $70 including shipping. Payment can be made via PayPal to nn1g@earthlink.net. Further details can be had at www.smallwonderlabs.com. There is now a user group at http://groups.yahoo.com/group/SWLRetro75.

UK TO ZL SOLAR POWER PEDESTRIAN MOBILE. Most QRP operation uses CW and sometimes I am asked if low powered operation is viable using SSB. Recently I received a report on an interesting QSO not only using QRP SSB but also completely solar powered. Dave Starkie, G4AKC, of Blackpool, reports, "I am very active on the HF bands, mainly pedestrian mobile, but some bicycle as well, however I am delighted to report that on 22 April at 1130UTC, I had a 2-way QSO with John, ZL2JBR in Wellington, New Zealand on 20m SSB whilst using only 'solar power' from my pedestrian mobile 2 wheel trolley (without the use of any batteries) with a 5/3 report. The QSO was witnessed by Lee, G0DBE. The radio on the trolley was a Mizuho MX-14S 20m 2 watt SSB/CW handheld transceiver powered by a double solar panel mounted on a 2 wheel trolley, and the antenna was a full size quarter wave again mounted on the trolley, the ground was a homemade tuned frame ground tuning unit without radials. It was sunny and, fortunately, it remained sunny throughout the QSO as if the sun disappears then so does my transmit and receive! I operated from Lytham on the Lancashire coast; very close to the sea water. Please visit my page on www.qrz.com/db/g4akc there are some pictures of the solar powered trolley listed under Latest Developments". *[There is more about David's work on page 16 of this issue – Ed.]*

FOUR DAYS IN MAY WON BY KE6TI. This year, the Four Days in May QRP event run by the American QRP ARCI included a real challenge to those who design and build QRP equipment. The FDIM 2010 QRP Challenge was to design and build an amateur band transceiver with 72 (or fewer) components! Roughly, the rules said "The transceiver is limited to a maximum of 72 parts. The receiver must be a superhet or other 'single signal' receiver. Keying and muting must be included. It must cover at least one of the standard QRP frequencies. Only one part may be an integrated circuit, all other parts must be discrete components." I was invited to be one of the three judges, the other two being long-time QRP stalwart Jim Stafford, W4QO and Ed Hare, W1RFI, the ARRL Laboratory Manager. W1RFI brought along test equipment from the ARRL headquarters laboratory. I must confess to a dislike of judging other people's homemade amateur radio equipment; I can only see good in them all.

The judging proved to be a delight. When the challenge was first announced several people said it was a foolish idea; a superhet transceiver with only 72 component parts was improbable. There were only four entries, with a fifth that just missed the deadline, but the ingenuity was amazing. Unfortunately, the entries could not be tested on the air but they underwent a series of stringent bench tests. The winner was Harold Smith, KE6TI, with an 80m VXO (variable crystal oscillator) transceiver covering 90kHz of the band. The design was well implemented in a smart case and although there were some problems, it won on the basis of design, bench testing and cosmetics. Well done to KE6TI.

Harold Smith, KE6TI, with his 80m variable crystal oscillator transceiver.

Data

A new look for the Data column

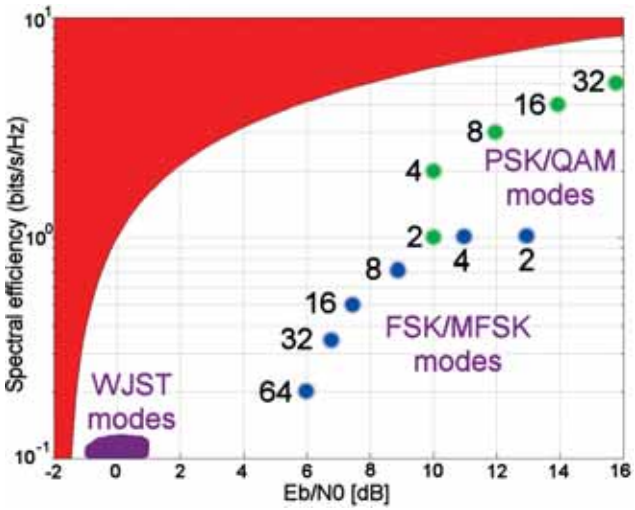


FIGURE 1: Curve showing the Shannon limit for communications efficiency (vertical axis) versus normalised signal to noise (horizontal axis). Several of the well-know data modulation types are marked. Communication cannot take place in the red-shaded area.

LEANER, FITTER. You may notice that we're down to one page this month. Don't panic - we're not reducing content or dumbing down, it's all part of a planned reorganisation. Data will remain bi-monthly but will now concentrate on the operating and medium of data communication. Some things we've looked at in the past such as DSP, SDR, hardware and software etc will move to the new, monthly Design Notes (see page 38). I do need your input for the Data column though. What is your data activity? What contests do you take part in? What experimentation are you doing? Please send me your experiences, stories and photos of the amateur datacomms world.

ROS UPDATE. Last time we looked at the new mode ROS and some of the issues it had raised. These seem to have mostly resolved themselves and many operators are now using this potent new data mode and coexisting with other users. There have been a few developments. On 500kHz band several EU countries were limited by their licences/NoVs to transmissions bandwidths of no more than 100Hz, less than ROS's minimum 125Hz. The author responded quickly and added a 100Hz MF mode specifically for 500kHz use.

A couple of ROS users e-mailed to say they had problems running it. Both were using Windows Vista. Peter, G3IRM wrote "ROS runs and starts to receive a message but then stops with a message stating that MSWINSCK.OCX or one of its components is faulty or not found - ERROR 339." Morrice, M5ADZ stated "I installed the program on my modern computer with plenty of resources (Vista). Transmission was not a problem but every time there was a decode of an incoming signal the program failed due to a runtime error. I could not find any help on the internet. I wonder if you had any problems with the program?"

Have you managed to install and run ROS without problems on a modern PC? Please send in your experiences, especially if you think your findings will help others.

SHANNON'S LAW. In 1948 mathematician Claude Shannon analysed data communications on noise-limited channels from a purely mathematical perspective. He formulated some rules and an equation that specified the theoretical capacity of a communications channel and the signalling rate it could support, but didn't say how or if it could be done. Shannon's findings can be summarised by the surprisingly simple-looking equation:

$C = B \log_2 (1 + S/N)$ or $R = \log_2 (1 + S/N)$

where C is the capacity in bits per second, B is the bandwidth in Hz and S/N is the signal to noise expressed as a ratio (not dB). In the second equation, R is the rate of the channel in bits per second per Hz – a sort of normalised way of expressing the channel capability. The equation shows that data rate, or capacity, is proportional to bandwidth and, as the channel quality improves with improving signal to noise, higher data rates become possible for a given bandwidth. We see this happen when we move from binary to quadrature phase shift keying, doubling the capacity for a given symbol rate with a more complex signal constellation that needs a higher S/N ratio to support it.

The equation suggests that at S/N = 1, or 0dB, a data rate exactly equal to the channel bandwidth is theoretically possible – which sounds a bit, well... far fetched. But remember, Shannon only gave this as a theoretical limit. Only in recent years have we have managed to even approach the Shannon limit, using the very latest techniques. Here's how it's done.

First we need to note that the N, or Noise term, itself contains bandwidth, as noise power is directly proportional to bandwidth. So now, we can see that the Shannon equation actually contains bandwidth twice, both inside and outside the LOG term.

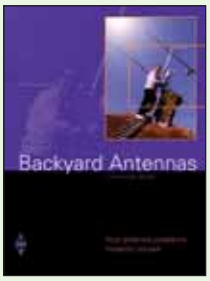
Now comes the interesting part. Communications efficiency can be improved if we widen our bandwidth for a given rate. But this has to be done in a proper, controlled way, for example adding extra information in the form of error correction in ways covered previously. So we might send, say, twice as many bits for the same data, doubling our bandwidth for the same original information rate. But the huge error correction advantage allows the S/N to be lowered way down, well below the original value that would have been needed for error-free copy of the uncorrected data. We have now improved our communications efficiency by increasing the bandwidth. Weak Signal Propagation Reporter (WSPR) waveform by Joe Taylor, K1JT is a practical example. The source information consists of a callsign, locator and power level, compressed into 50 bits, then expanded to 162 bits with error correction. It's sent (along with synchronisation) using FSK at about 1.5 bits per second. Our original 50 bits now take 110 seconds to send at 1.5Hz; the normalised rate is now only 0.3 bits/second/Hz. But the error correction allows reliable copy at a S/N ratio of around -1dB. Normal FSK (eg RTTY) needs about 10dB S/N in a bandwidth of about 1 – 2 times the signalling rate for reliable copy. So we have gained about 10dB in signalling efficiency at the expense of increasing our occupied bandwidth by around three times.

ROS does something similar to give its excellent low-noise signalling capability – and it would be nice to know how!

Figure 1 shows several modulation formats. Normalised signal to noise is along the bottom and rate in bits/sec/Hz on the vertical axis. The red shaded area is the Shannon limit, where communication is impossible. The closer we can get to it, the more efficient the modulation. The green blobs are PSK and QAM modes; PSK31 would sit close to the green blob labelled '2'. The blue marks are FSK and MFSK modes – normal RTTY on the one marked 2 – and are a long way from the Shannon limit. Contrast this with the heavy error-corrected coding in the WSJT modes in the purple area on the bottom left. It's only recently that we have got close to the Shannon limit – we are now about 0.5dB away.

Further information on Shannon and efficient information coding can be found at http://marconig.wordpress.com/2007/07/03/the-shannon-capacity-curve and www.dsplog.com/2008/06/18/bounds-on-communication-shannon-capacity.

Antenna



Backyard Antennas

By Peter Dodd, G3LDO

Radio amateurs and short-wave listeners all want to achieve the very best from their HF and VHF equipment. Receivers and transmitters are available to professional standards, but very few people have the real estate to erect the sort of antenna used by a commercial radio station.

Antenna guru Peter Dodd explains how, by using a variety of simple techniques, it is possible to achieve very high performance from a compact antenna. Also detailed is how to make an antenna efficient on several bands at once.

The book covers end-fed and centre-fed antennas, rotary beams, loops, tuning units, VHF/UHF antennas, antenna and mast construction, transmission lines, and how to estimate and measure the performance of your antenna. Whether you have a house, bungalow or apartment, Backyard Antennas will help you find the solution to radiating a good signal on your favourite band.

Size 244 x 183mm, 208 pages, ISBN 1-872309-59-3.

Non Members' Price £18.99 **RSGB Members' Price £16.14**

Building Successful HF Antennas

By Peter Dodd, G3LDO

Any metal structure can be made to radiate - to work as an antenna - provided it can be persuaded to accept RF power from a transmitter. But is it working efficiently? How can it be improved?

Well-known antenna expert Peter Dodd explains what makes an effective HF antenna, how to build one and how to measure its performance. The book deals with real locations, such as small gardens, apartment blocks, lofts, etc and how to obtain optimum performance within the constraints of your location.

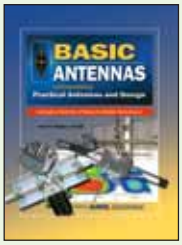
The construction of all manner of antennas is described including single and multi-band antennas, with and without the need for an ATU. There are also simple wire antennas, loops alongside beams such as the Quad and Yagi. There are variations on these which use less space. Feeding, matching and tuning are included as well as how to terminate coaxial cable in a variety of plugs. Peter's construction experience really comes into its own in the chapters on hardware, construction and masts. There is advice on how to check that your antenna is working using a few simple pieces of test equipment.This is quite simply everything you will need to make the best use of your location, and to build a successful HF antenna.

Size 240x174mm, 224 pages, ISBN 9781-9050-8643-6

Non Members' Price £14.99 **RSGB Members' Price £12.74**

For more antenna books visit

www.rsgbshop.org



Basic Antennas

Understanding Antennas & Design

By Joel R. Hallas, W1ZR

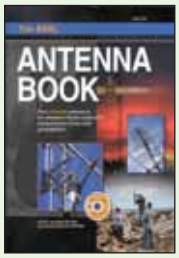
Basic Antennas Understanding Practical Antennas and Designs is a comprehensive introduction to antennas. Providing, basic concepts, practical designs, and details of easy-to-build antennas that really work!

Antennas are one of the most critical elements of a radio system, yet perhaps one of the least understood. This book is written in an easy to read manner and uses the minimum of mathematical concepts to allow introduction of basic principles. It also contains information on antenna impedance, transmission lines, antenna measurements and even antenna modelling. Readers will find included designs for dipole, reflector, microwave, loop and vehicle antennas. There are also wideband and multi-band antennas, Yagis for HF and VHF, two element arrays and much more.

Simply *Basic Antennas Understanding Practical Antennas and Designs* provides the ideal foundation in antenna theory and design for everyone interested in antenna construction.

Size 216x279mm, 216 pages,
ISBN 9780-87259-999-4

Non Members' Price £24.99
RSGB Members' Price £21.24



The ARRL Antenna Book

21st Edition

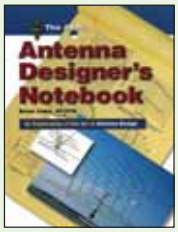
All the information you need to design your own complete antenna system.

Since the first edition in September 1939, radio amateurs and professional engineers have turned to The ARRL Antenna Book as THE source of current antenna theory and a wealth of practical how-to construction projects. Use this book to discover even the most basic antenna designs, wire and loop antennas, verticals, and Yagis–and for advanced antenna theory and applications. Many of the antennas in this edition benefit directly from advances in sophisticated computer modelling.

This 21st edition has been extensively revised to include information you can use to build highly optimized or specialized antennas. The book includes new content on Near Vertical Incidence Skywave (NVIS) techniques, phased arrays, S-parameters as used in modern vector network analyzers (VNA), Beverage receiving antennas, mobile, screwdriver antennas, ionospheric area-coverage maps, and much, much more.

944 pages, ISBN 0-87259-987-6

Non Members' Price £30.99
RSGB Members' Price £26.34



ARRL Antenna Designer's Notebook

An Exploration of the Art of Antenna Design

By Brian Cake, KF2YN

Radio amateurs continue to make true advances in antenna experimentation and *ARRL Antenna Designer's Notebook* looks at that process. From the idea through to a workable design this book presents the use of computers, antenna modelling software in arriving at an antenna solution.

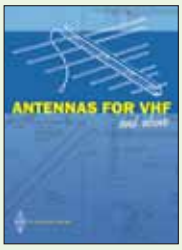
ARRL Antenna Designer's Notebook opens up the world of the antenna designer as the design is imagined, perfected, and finally constructed. This book provides a description of new components of antennas, such as the FZ element and the C-pole and provides designs of practical antennas made from them. The book also explores the details of an improved tunable HF loop, theoretical analyses of linear loading and ground losses, and practical designs for beams and omnidirectional antennas. Readers will find much besides including long Yagi antennas, box kite Yagis, Vertical Antennas, C Pole Antennas, Twin-C Antennas, Big Loops, Ground Plane Antennas and much more.

Size 210 x 270mm, 208 pages,
ISBN 9780-8725-9147-9

Non Members' Price £27.99
RSGB Members' Price £23.79

books

RSGB shop



Antennas for VHF and Above

By Ian Poole, G3YWX

The VHF, UHF and microwave bands provide an exciting opportunity for experimentation with antennas. This book from well known author Ian Poole is a fascinating guide to what can be achieved in these bands.

Antenna sizes at these frequencies mean that they do not occupy great amounts of space and most people can experiment with constructing their own antennas. Antennas for VHF and above, provides both the basic theory and constructional details for many antenna designs. The reader is taken through the essentials with details of the way the antenna works and the constructional information needed. You will also find helpful chapters covering measurements and installation techniques.

Antennas for VHF and above, is a mine of information for anyone wishing to understand or construct antennas for the VHF, UHF and microwave bands. This book is a valuable resource for anyone interested in antennas, whether a newcomer or experienced hand.

Size 240x174mm, 144 pages
ISBN 9781-9050-8645-0

Non Members' Price £12.99
RSGB Members' Price £11.04

Practical Wire Antennas 2

Edited by Ian Poole, G3YWX

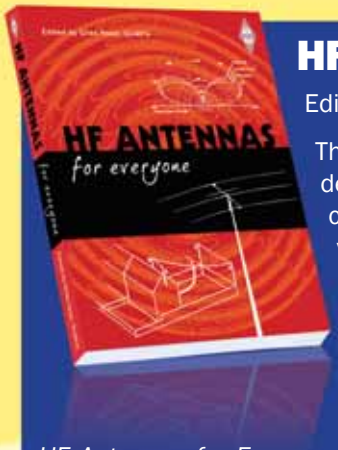
"Probably the best book on wire antennas ever"

Based on the hugely popular *Practical Wire Antennas* by John Heys, G3BDQ this book is a hugely extended and fully revised for the 21st Century. Nearly doubling in size with even more designs this book this practical book holds many complete and easy to understand recipes for a wide range of wire antennas.

Practical Wire Antennas 2 provides a collection of antenna designs and ideas that will help capture the enjoyment of experimenting in the true spirit of amateur radio. This book will help improve any station and is a must have book for anyone interested in antenna construction.

Size 240x175mm, 176 pages
ISBN 9781-9050-8604-7

Non Members' Price £11.99
RSGB Members' Price £10.19



HF ANTENNAS *for everyone*

Edited by Giles Read, G1MFG

The RSGB has always published the very best antenna designs available to the radio amateurs. From the most complex, to the very basic, these antennas have provided radio amateurs with much food for thought and practical designs to build. *HF Antennas for Everyone* draws on 90 of these *RadCom* and *Radio Communication* articles from the last forty years, providing a comprehensive collection of HF antennas, with something for everyone.

HF Antennas for Everyone is a deliberate mix of designs which have been divided into sections covering horizontal, vertical and loop antennas. The book also shows that no matter the size of the available space you have, there are antenna designs here that will help you get your signals in and out. There is also a Feeder section and even if your local regulations prohibit the erection of antennas *HF Antennas for Everyone* provides a section on Stealth antennas that are essentially invisible.

It is often said that there is nothing new in aerials, but *HF Antennas for Everyone* shows the considerable developments and innovations from the last 20 years. Whichever bands you want to work on and however small your garden, HF Antennas for Everyone will provide an antenna that will get you heard.

Size 240x174mm, 336 pages, ISBN 9781-9050-8659-7

Non Members' Price £14.99 **RSGB Members' Price £12.74**

More Antenna Books

More Vertical Antenna Classics	£13.99	**£11.89**
International Antenna Collection	£12.99	**£11.04**
International Antenna Collection 2	£12.99	**£11.04**
HF Antenna Collection	£19.99	**£16.99**
HF Antennas for all Locations	£19.99	**£16.99**
The Antenna Experimenters Guide	£17.99	**£15.29**
ARRL Simple & Fun Antennas for Hams	£16.99	**£14.44**
ARRL Yagi Antenna Classics	£13.99	**£11.89**
ARRL Antenna Compendium VOL 1	£10.99	**£9.34**
ARRL Antenna Compendium VOL 2	£12.99	**£11.04**
ARRL Antenna Compendium VOL 3	£12.99	**£11.04**
ARRL Antenna Compendium VOL 4	£14.99	**£12.74**
ARRL Antenna Compendium VOL 5	£14.99	**£12.74**
ARRL Antenna Compendium VOL 6	£15.99	**£13.59**
ARRL Antenna Compendium VOL 7	£16.99	**£14.44**
ARRL Wire Antenna Classics	£12.99	**£11.04**
ARRL More Wire Antenna Classics VOL 2	£12.99	**£11.04**
ARRL Vertical Antenna Classics	£12.99	**£11.04**
ARRL VHF/UHF Antenna Classics	£12.99	**£11.04**

RSGB Members' Prices displayed **BOLD**

Radio Society of Great Britain
3 Abbey Court, Fraser Road, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496

www.rsgbshop.org

E&OE All prices shown plus p&p

Using Wi-Fi instead of PLT

How I connected my TV box to the internet without wires or PLT

PHOTO 1: Belkin Wireless G Gaming Adapter – wireless TV connection without PLT problems.

PLT: SPECTRUM OFFENDER. I was faced with the problem of connecting a TV set-top box to my BT Home Hub. There was no easy way of running network cables without ripping up floorboards – which the YL wasn't keen on – which left me looking for a wireless solution of some sort. As we know, PLT adapters provide a convenient means to run network connections over mains wiring. Unfortunately, they can 'trash' most of HF in doing so – something I am naturally keen to avoid. So I needed another solution.

THE PROBLEM. My set-top box is a Freesat+ HD receiver and, like many other modern set-top devices, it has an RJ45 socket on the back for an internet connection. On my receiver this connection gives direct access to BBC iPlayer without using a computer, so is of significant benefit to me. But actually getting a physical connection to my BT Home Hub (broadband box with integrated wireless and wired router) was nigh-on impossible. All my computers connect to the Hub via Wi-Fi; the laptops have built in Wi-Fi adapters and the desktop machines have either a USB Wi-Fi dongle or a PCI card.

Wi-Fi operates between about 2.4 and 2.45GHz – in the shared part of the 13cm band, very close to the microwave oven frequency. Whilst it is a wideband mode and does cause problems to some 13cm enthusiasts (me included), there is a lot more of 13cm that is not shared with Wi-Fi and is relatively interference-free. As I already run a Wi-Fi system (as do many of my neighbours) I figured that one more Wi-Fi device in an already crowded, shared band was not really a problem.

There are any number of USB Wi-Fi dongles on the market but unfortunately none of the set-top boxes I've come across are compatible with USB cards. I did some research on the internet and eventually came across the Belkin Wireless G Gaming Adapter. It's a magic device that does exactly what I need – a standalone Wi-Fi adapter with an RJ45 socket that behaves just like a wired connection to the Hub. Brilliant! Inside, there is a Wi-Fi transceiver and a small web server – more on that later.

I found my Belkin Wireless G Gaming Adapter on eBay. There also several other types of similar adapter available from different manufacturers, all (at the time of writing) in £30-ish price bracket. One word of warning: do read the description carefully, because I encountered several "wireless gaming adapters" that were actually PLT devices, not Wi-Fi. *Caveat emptor!*

IMPLEMENTING THE SOLUTION. Like most wireless networks these days, my BT Home Hub is encrypted. This means that the Belkin adapter requires a bit of configuration before it'll work. If you've ever set up a Wi-Fi device before, many of the steps will feel familiar. I expect that other Game Adapters will have similar configuration steps; refer to their documentation for details. There are even, apparently, two different versions of the Belkin Wireless G Gaming Adapter – one with a single aerial, like mine, the other with two aerials. The detailed configuration steps differ but the same basic information is required.

The Belkin configuration CD that came with my Adapter was problematic. It tries to shield you from some of the complexities but does require some technical input. I found it quite hard to use and unreliable – it stopped working several times when I attempted to use it. Eventually, I discovered the Adapter's built-in web interface. Getting to it isn't that easy – I had to switch off my PC's wireless connection and then use the supplied LAN cable to connect it to the Adapter. The next step is manually changing the PC's IP address so it can 'see' the Adapter (**Figure 1** shows this for Windows XP). After applying the change I launched a browser and connected to the Adapter at http://192.168.2.225. Once logged in to the adapter (there is no default password; leave the field blank) I could start configuring it.

The main steps were to run a Site Survey to identify my network, select the encryption type and enter the wireless password. After saving the changes I found I could access the internet on the PC – it had picked up an internet connection via the Gaming Adapter. I had a quick browse round the web to check all was OK, then disconnected Adapter from the PC and plugged it into the Freesat box. I was rewarded with perfect internet connectivity and access to BBC iPlayer on my TV. If I'd been using another kind of set-top box then the connection would have given me perfect video on demand or whatever other services were available.

CONCLUSION. While Wi-Fi type G connections are 'only' rated at 54Mbps, this is far in excess of what a TV set-top box will need. It is also, for that matter, rather faster than a standard broadband connection so it should always have plenty of capacity to stream video. It happily and peacefully coexists with my other PCs that connect to my BT Home Hub using Wi-Fi. But the greatest advantages are that Wi-Fi does not pollute the HF spectrum – and the price is the same or less than a pair of PLT adapters.

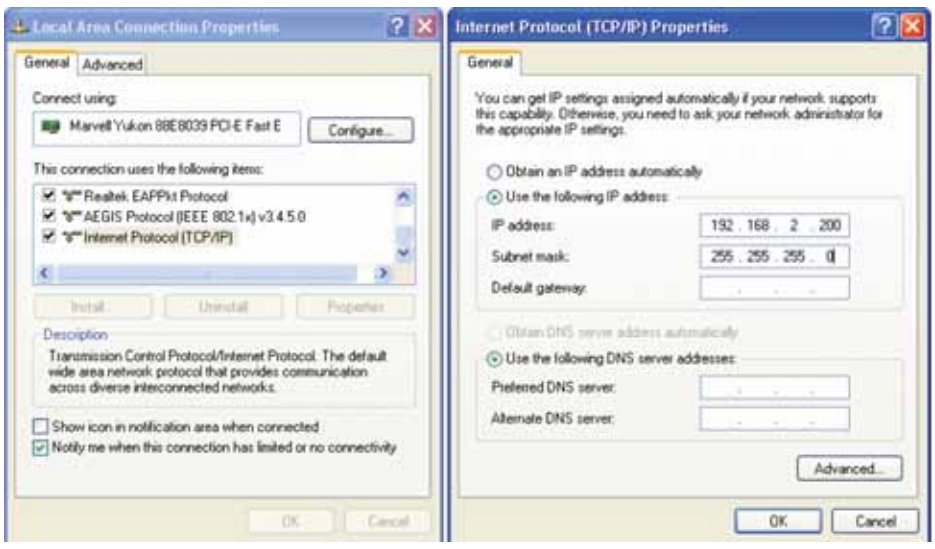
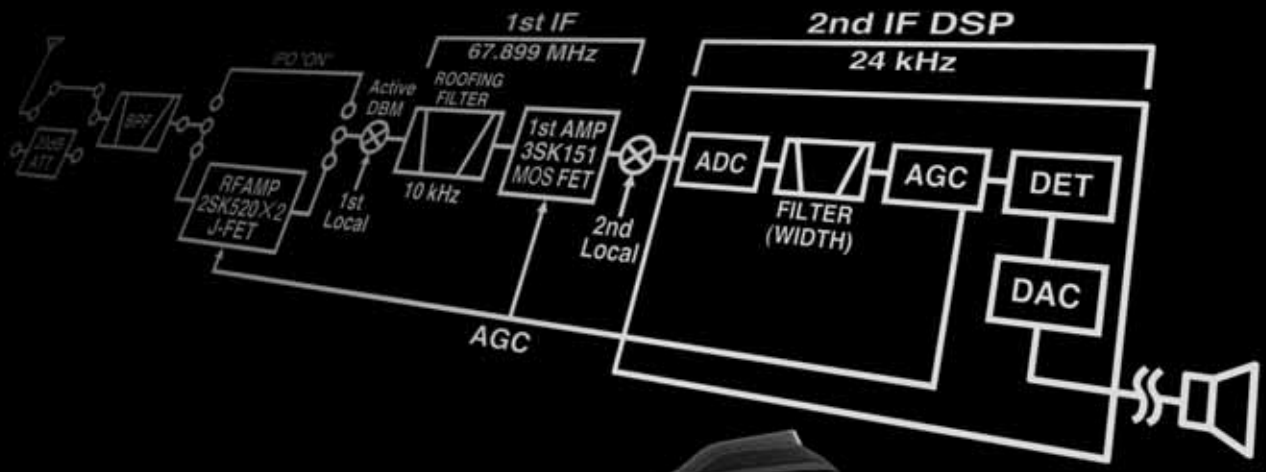


FIGURE 1: Manually setting the PC IP address so it can 'see' the Gaming Adapter.

FT-450/AT

HF/50MHz 100W All Mode Transceiver

World CLass Performance in an easy to operate transceiver, with Yaesu's unique IF DSP



FT-450 / FT-450AT

The FT-450 may be fitted with the optional automatic internal antenna tuner, the ATU-450.
The FT-450AT has the ATU-450 already installed.

YAESU

www.yaesu.co.uk

Getting listed here and on GB2RS is easy. E-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. The deadline for the September *RadCom* is 1 August and for the October edition it's 1 September. For GB2RS, the deadline is 10am on the Tuesday for the week of broadcast.

1 SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, GM0ONX@RSGB.ORG.UK

AYR ARG
Charlie, MM0GNS, 01563 551704, cgnstewart@hotmail.com
6 Weekend event Ayr International Flower Show
21 Weekend event ILLW at Turnberry, Ayrshire

BORDERS ARS
Ray, GM0CDV, 01573 228730
13 Club Closed

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
6 Normal club night
13 Annual mini-rally night
21 Lighthouse Weekend Barns Ness GB2LBN

KILMARNOCK & LOUDOUN ARC
Graham, MM3GDC, mm3gdc@btinternet.com
10, 24 Club Night

LIVINGSTON & DARS
Norman, 07740 946192, uk.groups.yahoo/group/ms0liv
3, 17, 31 Club evening
10 Operating evening
24 Morse code practice

WEST OF SCOTLAND (GLASGOW) ARS
Fred Coombes, 2M0BIN, 01415715512, www.wosars.org.uk
4, 11, 18, 25 Construction projects & licence training
6, 13, 20, 27 Presentations, guest speakers, raffle & quiz

2 SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, GM1BAN@RSGB.ORG.UK

No entries received this month

3 NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, M1CNY@RSGB.ORG.UK

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
9 30 years of radio contesting by David, G8ZRE
23 2m DF field event from the Britannia Hotel

MORECAMBE BAY ARS
Martin Hazel, M0ZIF, 01524 848193, martin@mbars.internationalham.com
3 Treasure hunt
10, 24 Social evening
17 Committee meeting
31 Film night

PRESTON ARS
Richard, M0RDZ, 07855873566, secretary@prestonars.co.uk
12 The G5IJ antenna by Roy, G0TAK
26 HF OTA

WORKINGTON & D AR&IT GROUP
Barry Easdon G0RZI, 01946 812092
2 OTA and club meeting
16 Demo of meters and test gear by Glyn, M0UXH

4 NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, G0UGE, G0UGE@RSGB.ORG.UK

ANGEL OF THE NORTH ARC
Nancy Bone, G7UUR, 0191 477 0036, nancybone2001@yahoo.co.uk
2, 9, 16, 23 OTA, natter night
6 Advanced exam
30 Closed

EAST CLEVELAND ARC
Alistair, G4OLK, 01642 475 671, alistair.mackay@talk21.com
6, 20 OTA
13 Technical forum
27 Radio components catalogues evening

HALIFAX & DARS
Anthony Vinters, 01422 822636, tony@g0wfg.demon.co.uk
17 Working /P at Blackstone Edge from 7.30pm

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240573, gmacnaughtwov@yahoo.co.uk
4 Committee meeting
11 Y Service Intercept by Ted, G3UOZ
12 80m Club Sprint - CW
18 Fox hunt - first call 7.30pm
25 80m Club Sprint - SSB

OTLEY ARS
Paul, 2E0PAK, 07768 996370, m6wat@pekae.co.uk
3 144MHz UKAC
10 Member presentation: DXpedition to Robben Island
17 Open shack night
24 50MHz UKAC & village hall natter night
31 70MHz UKAC

SCARBOROUGH AMATEUR RADIO SOCIETY
Jerry Scarr G6LBL, 01751 476601, jerryscarr@googlemail.com
2 Club Discussion Night
9 Scarborough & Ryedale Mountain Rescue talk, Andy Crossley
16 Final SSB NFD / digital evening
26, 30 Closed

SHEFFIELD ARC
Trevor Wood, M0TWS, trevorwood6@yahoo.co.uk
2 My Shack: 4 mini talks
9 How to build an outside shack by M1ERS
16 Grand summer junk sale
23 Talk or video
30 Social evening & final prep for SSB field day

5 WEST MIDLANDS

REGIONAL REP: TREVOR BAILEY, M0KMB, M0KMB@RSGB.ORG.UK

CHELTENHAM ARA
Derek Thom, G3NKS, 01242 241099, G3NKS@blueyonder.co.uk
19 Mobileers Meet

COVENTRY ARS
John, G8SEQ, 07958 777363
6 Mini lectures
13 BBQ & society portable night – Newbold Comyn
20 3rd round G4ZMC trophy – Hartshill Hayes
27 Radio workshop, VHF/UHF operating

GLOUCESTER AR&ES
Anne, 2E1GKY, 01452 548478, daytime, www.g4aym.org.uk
16 Saul Junction Canal picnic/operating
30 Bank holiday operating at Crickley Hill

KIDDERMINSTER & DARS
Barry, G4CTU, 01562 823966
3 OTA & planning for SSB Field Day

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
4 Ragchew and training classes
11 Laptop computer evening
18 OTA and training classes
25 Review of rallies to visit, training classes

MID-WARWICKSHIRE ARS
Don G4CYG, 019 2642 4465
7 HF Field day
24 Chairman's BBQ

SOUTH BIRMINGHAM RS
Don, 0121 458 1603, www.radioclubs.net/southbirmingham
2 Telford rally planning meeting
4 Lecture, BBQ afterwards
6, 13, 20, 27 Construction evening
9 OTA and contest meeting
16 Natter night
23 Contest planning and aerial review
30 Closed

TELFORD & DARS
Mike J Street, G3JKX, 01952 299677, mjstreetg3jkx@blueyonder.co.uk
4 Committee meeting at Heath Hill, HQ closed
10 HamFest committee at Heath Hill
11 VHF NFD, μwave & 6m contest debrief
18 Preparation for Hamfest
25 Fox hunt, meet at Rugby Club

WYTHALL RADIO CLUB
Christopher Pettitt, G0EYO, g0eyo@blueyonder.co.uk
2, 7, 9, 16, 23 Foundation course
3 2m UKAC contest
10 Committee meeting
14 Weekend special event Steam Rally, Bromsgrove
17 Homebrew
24, 31 Natter / OTA
26 Foundation Exam
28 Weekend special event, Land Rover Show, Stoneleigh

YOUR RSGB SUPPORTING YOUR CLUB

6 NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, MW1MDH@RSGB.ORG.UK

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620733
2 Quiz night
16 A Panadapter for the Elecraft K3 by GW0ETF

7 SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, MW0EQL@RSGB.ORG.UK

CHEPSTOW & DARS
Wil Oliver, MW6KGB, 01291 621342
3 Use of Radio by HM Coastguard by Terry Baldwin

LLANELLI ARS
Craig, MW0MXT, 01269 840292, craig@mw0mxt.co.uk
2 OTA
9 Club raffle
16 DVD night
23 Junk sale & club raffle
30 Closed

8 NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, MI5JYK@RSGB.ORG.UK

No entries received this month

9 LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, G8ROG@RSGB.ORG.UK

AYLESBURY VALE RS
Roger, G3MEH, 01442 826 651
11 HF aerials by Roger, G3MEH

BROMLEY & DARS
Andy, G4WGZ, 01689 878089
17 Bring a toy

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
2 Pub meeting
16 Natter night

COULSDON ATS
Andy, G8JAC, g8jac@btinternet.com
9 BBQ at G4RWW QTH

CRYSTAL PALACE R&EC
Bob, G3OOU, 01737 552 170
6 Summer BBQ

DORKING & DRS
Garth, G3NPC, 01737 359472, www.ddrs.org.uk
24 Social evening, fish & chip supper

EDGWARE & DRS
Mike, G4RNW, 020 8950 0658, michael.stewart5@ntlworld.com
12 Closed
26 Natter night

MILTON KEYNES ARS
www.mkars.org.uk
2, 16, 31 Shack open night
9 Antenna workshop
22 Lighthouse weekend at Beachy Head lighthouse
23 Portable night
29 MKARS rally, Bletchley Park

NEWBURY & DARS
Richard, G3ZGC, 01635 46241, richard.jolliffe@vodafone.com
25 G6ALU 80m SSB kit

RADIO SOCIETY OF HARROW
Linda, G7RJL, 0208 386 8586, www.g3efx.org.uk
29 Weekend event GX3EFX/P, Harrow in Leaf Show, Harrow Museum

READING & DARC
Pete, G8FRC, 01189 695 697
12 OTA plus Tony, G1HBD with his ATV OB van

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
11 BBQ

SURREY RADIO CONTACT CLUB
Ray, G4FFY, 01732357474
2 Club talk
16 Fix-it and natter night

SUTTON & CHEAM RS
John, G0BWV, 020 8644 9945, info@scrs.org.uk
19 ATV by John Stockley, G8MNY

WEY VALLEY ARG
www.weyvalleyarg.org.uk
6, 20 Club night

WIMBLEDON & DARS
Jim, M0CON, 020 8874 7456, www.gx3wim.org.uk
6 BBQ at annual camp
8 Dismantle annual camp
13, 27 Closed

10 SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, G6DGK@RSGB.ORG.UK

ANDOVER RAC
Martin, M0MWS, 07776181646, www.arac.co.uk
3, 17 Club Night
22 Autumn boot sale

FARNBOROUGH & DRS
Derek, G3OFA, mail@farnboroughradio.org.uk, www.farnboroughradio.org.uk
11 Natter night
25 Club night

HARWELL ARS
Malcolm, G8NRP, 01235 524844, info@g3pia.org.uk
14 BBQ

HASTINGS E&RC
Gordon, 01424 431 909, gordon@gsweet.fsnet.co.uk www.herc.uk.net
25 Interference problems

HORNDEAN & DARC
Stuart, G0FYX, 023 9247 2846, www.hdarc.co.uk
3 Natter night/social evening
24 Interference by Paul, G0VEP

HORSHAM ARC
www.harc.org.uk
5 Club Closed

HORSHAM ARC
www.harc.org.uk
19 Social, The King's Head, Rudgewick

ITCHEN VALLEY ARC
Charlie, M0WYM, 02380 439560, secretary@ivarc.org.uk
13, 27 Club night

MID-SUSSEX ARS
Peter, G4AKG, 01444 239371
6 Boules evening at The Crown, Newick (Cyprus Hall shut)
13 Talk on BBC by Tony Crake
20 Radio night
27 Radio night & table top sale

SOUTHDOWN ARS
John, G3DQY, 01424 424 319
2 Chaseley Talk and DVD on Radio St. Helena, Tristan Da Cunha by Tony, G0EYE
4 Operating at Hailsham shack

SWINDON & DARC
Den, M0ACM, 07810 317750, www.sdarc.net
5, 12, 29, 26 Natter night

TROWBRIDGE & DARC
Ian, G0GRI, 01225 864 698, E/W
15 Natter Night

WORTHING & DARC
Roy, G4GPX, 01903 753 893
4 BBQ
11 Discussion evening
18 Closed
25 GX3WOR OTA

11 SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, G7SME@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473251
16 SSTV, by Mike, G3PGA

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420442
30 The Falkland Islands by Steve Hartley, G0FUW

SOUTH BRISTOL ARC
Len, G4RZY, 01275 834 282
5 Technical topics with Len, G4ZRY
12 Summer table top sale, Len, G4ZRY
19 Summer darts match, Fred, G7LPP
26 OTA supervised by David, G7PKJ

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
4 Quiz, Dave, M0CIF
11, 25 OTA

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417048, tonytsgarc@btinternet.com
4 Fox hunt
11, 25 OTA
18 Video night

WEST DEVON RC
Jules Cuddy, M1AGY, 01752291588
10 Open evening, all invited, M0WDC OTA, tea, coffee & chat
24 Backyard & loft antenna evening, Jules, M1AGY

YEOVIL ARC
Steve Crask, G7AHP, steve@g7ahp.co.uk
5 Fox hunt
12 Practical evening kit building
19 Talk on the Tone RX, G3PCJ
26 OTA

A well-equipped club shack, available for members to use.

12 EAST & EAST ANGLIA

REGIONAL REP: PHILLIP BROOKS, G4NZQ, G4NZQ@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404154, secretary@bittern-dxers.org.uk
12 Informal club meeting
21 Weekend ILLW event - GB2BML, Blakeney Mariners Light
26 Planning SSB field day

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008, www.g0mwt.org.uk
3 Re-licensing your licence by CARS members
10, 17, 24, 31 Club net night
11 Committee meeting - Danbury

COLCHESTER RADIO AMATEURS
Kevan, 2E0WMG, 07766543784, kevan2e0wmg@live.co.uk
19 BBQ and portable operating on school field

DARENTH VALLEY RADIO SOCIETY
Ray, G0FDU@G0KDV.com
11 D-Star update by 2E0ULA
25 HF field day preparation

GORLESTON ARS
David, G3OEP, QTHR, 01493 662 323
28 Lunch time meeting at the Short Blue Hotel, Gorleston

KING'S LYNN ARC
Ray, G3RSV, ral-g3rsv@supanet.com, www.klarc.org.uk
1, 5, 12, 19, 26 Club night and 2m club net
21 Weekend event Lighthouses on the Air at Hunstanton Lighthouse

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC, 020 8502 1645
13 HF OTA
14 Weekend get-together, Rainbow and Dove, Hastingwood
27 Visit by RSGB R12 Manager Phillip, G4NZQ & Essex DRM Mark, M0IEO

LOWESTOFT & DISTRICT ARC
Phil, G0JSG, 01502 585448, pholden433@btinternet.com
5, 12, 19, 26 Club night at shack

NORFOLK ARC
Chris Danby, G0DWV, 01603 898678, cmdanby@btinternet.com
11 Informal, construction and workshop
25 Informal, construction, workshop & Bright Sparks

SOUTH ESSEX ARS
Norman, M0FZW, 01268 692776, secretary@southessex-ars.co.uk
11 A humorous look at the internet by Vic, G6BHE

13 EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, G0EJQ@RSGB.ORG.UK

DERBY & DARS
Richard Buckby, radio@dadars.org.uk
3 Junk sale
10 Committee meeting
17 Quiz night
24 Technical topics
31 OTA

FRISKNEY AND EAST LINCOLNSHIRE COMMUNICATIONS CLUB
Chris M0MFP, 01507 442240
3 Anything goes night
15 Radio rally

KETTERING & DISTRICT ARS
http://kdars.co.uk
1 General meeting 11am, followed by social meeting
3, 10, 17, 24 OTA 7 – 9pm
4, 11, 18, 25 Gentleman's group afternoon
5, 12, 19, 26 Training 7 – 9pm
8, 15, 22, 29 Social meeting

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO, 01427 788356, pamelagrose@tiscali.co.uk
4 G5FZ on the air
7 East Kirkby RAFBF EK Airshow. Ticketed event.
11 Photoshop tips, tricks & possibilities, Alistair, M0TEF
14, 21, 28 G5FZ OTA and jobs around the shack
18 G5FZ OTA & natter night
25 G5FZ OTA & contest planning

LOUGHBOROUGH & DARC
Chris, G1ETZ, 01509 504 319
3 Kite night, subject to weather
10 DF 160m - new rules
17 HF OTA
24 Practical evening

SPALDING & DARS
Graham Boor G8NWC, 07947 764481, www.sdars.org.uk
3 144UKAC at the Portakabin
20 Antenna natter night

STENIGOT CHAIN HOME ARC
Steve Burke, M5ZZZ, 01507 600202, m5zzz@btinternet.com
20 Planning permission for the amateur by Steve, M5ZZZ

WELLAND VALLEY ARS
Peter D Rivers, G4XEX, QTHR, 01858 432105, g4xex@fsmail.net
16 OTA (PSK/SSTV etc)
22 Rugby Radio Rally (new venue)

FREE MEMBERS' ADS

Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 88).

FOR SALE

10GHz TWT & PSU. ITT W3MC/F3 25W O/P £75. 12m Heliax LDF5-50, N male to N female, £50. Hy-Gain 500W balun dipole feed, SO239 input £20. Waveguide, attenuators, diode mounts etc, too much to list, call for more info. Adrian, G4UVZ, 01823421751, adrianwhatmore248@btinternet.com (Taunton).

30' WINCH UP, TILT-OVER MAST, wall mounting. All fittings intact but probably needs new cable. 3.5" square section outer with 3" tubular inner section 15' when fully retracted. £50 buyer collects. Heavy but can be handled by two people for transport so bring a friend. Full details on request. Rob, G4FAX, rob.macfie@googlemail.com (Luton).

4-BTV HUSTLER 40-10m vertical 1kW. Spec as per ads in *PW*/*RadCom*. Erected and used for 3 months, but is still good as new. £125 ono, P&P (DHL) £11 or collect. B Rayner, G1VZT, 07910 439848 or 01473 687224 evenings (Ipswich).

AVO MODEL 9 MK 2. Works on all ranges but no batteries or leads, £15. Prefer buyer collects due to fragile meter movement. Ian, G6PSO, 02476 467265 (Coventry).

CLASS D WAVEMETER. S Sutherland, GM4BKV, 01224 691716 (Aberdeen).

CODAR AT5 TRANSMITTER + original power supply & interconnecting lead. Pristine original condition, good metalwork, working. Valves included. Unmodified. A good home required for this classic 160/80m Tx. Copy of manual. Offers by SMS only, 07549 160011. Ipswich, Suffolk (A12/A14).

GAP TITAN-DX VERTICAL ANTENNA. New Oct 2009. Covers 8 bands from 80m to 10m incl. WARC. Centre fed, no radials required. Length 25ft. Can be mounted any height above ground from 1ft upwards. Price reduced to £185. Eddie Lane, M0NOV, 01636 626520 (Beckingham, Lincoln).

KENWOOD TRANSCEIVERS. TS 570 DGE HF, 100W, DSP, £450. TS 711E, 144MHz all mode, £300. Both excellent condition (non smoker operator), boxed with instructions. Inspect and collect or + postage. Gordon, G7MHQ, 01484 329886, gordon.g7mhq@ntlworld.com (QTHR, Huddersfield).

KENWOOD TS-520SE (HF non WARC) with extra CW filter fitted and DG5 digital readout, £175. External VFO-520S inc cable, £40. MC 50 mic, £40. Or £225 the lot. All clean, tidy and working FB. Steve, G1MPW, 0208 688 3641 (Croydon).

LDG Z11 PRO AUTO-TUNER. As new, never been used, £85. Yaesu FT897 HF/VHF/UHF transceiver. Mint, box, manual etc, £485. Carriage extra. Wanted, FT840 HF transceiver, must be in excellent condx and TS50S HF transceiver. Ray, G4OWY, 0777 649 5381, g4owy6@gmail.com (Dorset).

MILITARY RADIOS. Russian ex Special Forces, R853. As new, c/w all accessories, 100-149MHz, 0.5W AM. Used for ground to air comms. £325 or trade for Mk. 123. GRC 9, LV 80, amp. GWO c/w spares, £275. Chas Wilson, M0CDD, 01755 766398 (eves) (Spalding).

NATIONAL HRO MX Rx & coil packs, working order, fair condx, suit enthusiast or collector. Other vintage gear inc absorption frequency meter, GW9205 250V/25mA stabilised PSU, Ediswan stabilised PSU type R1095. Best offer secures, buyer collects. Mrs Higgs, 01566 86403 (Launceston, Cornwall).

RACAL RA17L £80, Racal RA117E £150 Racal MA79 Universal drive unit with manual £120, 19 inch rack 5 feet high on casters, £50. Various RA17 spare subassemblies. Marconi CR100, £70; CR300 £50. C Young, 01637 875848 (Newquay).

***RADCOM* BACK ISSUES**. Most of 1983-1994 plus complete set from 1995-2009 inclusive, all the latter in pristine condition, many unopened. Free to a good home, just come and collect. Property of Maurice, G3FFY (SK). Tim Stedman, 01708 251370 (Upminster, Essex).

RF DIP OSCILLATOR, transistorised, 0.44–280MHz in 6 ranges. Power 9V battery. Small crack in meter cover. £20 including p&p. LM13 frequency meter, 125–20,000kHz. No charts. Bendix made 1939 for US Navy. Nice slow motion dial and capacitor. Free. Collect only. Peter Ball, G3HQT, 01489 570735 (Warsash, Southampton).

SHURE 444 mic £25, eight pin plug fitted for Yaesu radios FT920, FT1000 etc, also fitted up/down button. Alan, G4PPW, 01933 388443 (QTHR, Northants).

SK SALE DE G2OT: TS530SP £175 OVNO, TS830S+VFO230 £250 ovno. Both believed in GWO with additional filters (CW & SSB). Both VGC and mostly used CW. Trio 9R59E Rx + matching spkr £30. All with manuals + original packing. Carriage extra at cost. Prefer buyer inspects and collects. Pete, G3WXC, 01983 296958, peter.brooker@waitrose.com (Cowes).

TELEGRAPH KEY RESTORATION BOOK. 8-1/2" x 11", 107 pages, 254 colour photographs. No pages are missing, no marks, etc however there is light yellow line crossing some pages which doesn't affect the reading. £25 recorded postage paid UK. PayPal or cheque. Marcelo, LW3EOV, 07986 699554, marcelo0680@yahoo.co.uk (London).

TEN-TEC OMNI V1 PLUS, £700. Kenwood TS 570 G, £490. Yaesu FT 920 A/F, £700. Expert 1K-FA automatic linear amplifier £1400. Paul, G8IYG, 01785 259898, paulgobey@tiscali.co.uk (Stafford).

YAESU FRG-100 radio, £200. Kenwood. TM 241E, £60. Yaesu FT 840, £250. Alinco DX-70, £180. Yaesu FT-5100, £95. MFJ tuner 948, £70. MFJ tuner 969, £70. Marconi TF 2015A sig gen, £50. Trio 9R-59DS receiver, £35. Lots more. Buyer collects. Pascal, GI0SFT, 028 7135 2804 after 6.00pm, pascalmcd@aol.com (Londonderry).

YAESU FT-920, HF plus 6m in near mint condition, boxed, complete with manual and original mic (MH31), AM filter plus FM fitted. £600 ono. Reason for sale: to fund new hobby. Mick, G0IET, 01780 754401, mickg0iet@talktalk.net (Stamford, Lincs).

YAESU FT-290 2m multimode xcvr, 50W Microset Tx/Rx amp, R600 Rx. Shack has to go so offers please. T N Tisdall, G8BJL, 01925 758805 (Cheshire).

YAESU FT-990AC. Good condition £450 ono. Keith, G0KSS, 01524 781946 (Carnforth).

WANTED

DISABLED FAN OF OLD DAYS seeks pre-1975 QSLs, magazines, etc. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

ELECTRONIQUES VALVE TYPE general coverage front end and any associated bits such as the IF strip. WHY? James Coubrough, VE7BBX, 01389 756660, jarroll@o2.co.uk (Glasgow area).

FT757GX POWER LEAD. Has any member got a FT 757GX power lead in a old box of bits in their shack? It's the four pin one with 2 upright pins and 2 across pins. Hope someone can help. Zoe, M6ZLN, 01582 515913 (Luton).

KENWOOD TS-830S. Fully operational and in good cosmetic condition. Will collect reasonable distance. Mike, G3NKR, 01962 861575, g3nkr@ivarc.org.uk (Winchester).

KENWOOD TS-870S. Not too fussed about condition but must be fully working. Prepared to exchange for brand new Dell Vostro 3500 laptop 3GB memory and Windows 7 Home. Can collect within reasonable distance of Luton. G4FAX, 07713 084 244, rob.macfie@gmail.com (Luton).

MAIN TUNING SHAFT ENCODER for FT-1000 transceiver, Yaesu part number Q9000523. No longer available from Yaesu but is also used in FT990. If you have a redundant rig, a spare Q9000523 or know where I could get one, please contact G3PNH, 01249 653548, bernardwilson_08@btinternet .com (Chippenham, Wilts).

MORSE KEYS wanted please. Avid collector looking for straight keys, bug keys, spark keys etc. In particular Marconi. Please ring or e-mail John, G0RDO, 01626 206090, john@morsemad.com (Newton Abbot).

RADIO TAPE RECORDINGS 60s, 70s, pirate stations, 208, BBC. Do not throw away old recordings because of broken recorder. Best prices paid - what have you? Dave, G8ZRE, 01244 316673, g8zre@hotmail.com (Chester).

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, AQuest1263@btinternet.com (Leeds).

THE FOLLOWING VALVES: 6V6, 6SK7, 6X5, ARTH2. Class D Wavemeter manual. Buy / copy, all costs met. John, G8LJO, 07815 683158 g8ljo.jon@googlemail.com (Southampton).

VINTAGE TRI-ANG TRI-ONIC Radio Construction Kits A and A/B to show children what got me started in ham radio. Particularly need set A/B but interested in A for spares. Incomplete sets considered. David Howlett, M0VTG, 01733 237374 (Peterborough).

Continued on page 87

SILENT KEYS

We regret to record the passing of the following members:

Mr R H Beech, G0KCP	
Mr W H Atkins, G0KTF	
Mr R H Cooper, G0MSM	15/6/2010
Mr N H Vickerstaff, G0VYR	7/5/2010
Mr T A H Woodcock, G1GFU	3/1/2010
Mr W Paish, G2AIS	29/1/2010
Mr W A Croxall, G2FRT	5/3/2010
Mr R Moreton, G3EMY	5/2010
Mr D Connor, G3FD	
Mr E F Harverson, G3OEG	
Dr P H Masterman, G3RHH	22/5/2010
Mr D J Viney, G3SJV	9/6/2010
Mr N K Read, G8CXL	3/6/2010
Mr B S Adam, GM0HBM	30/5/2010
Mr F J Ewing, GM4LHM	
Mr P F Jones, GW3FPF	185/2010
Mr T J Perry, GW4XQK	
Mr F S W Wells, M0HOD	22/6/2010

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

31 JULY - 1 AUGUST - **AMSAT-UK INTERNATIONAL SPACE COLLOQUIUM** - Holiday Inn Hotel, Egerton Road, Guildford, GU2 7XZ. Presentations on amateur satellite communications and meet the satellite builders. GB4FUN in attendance. [www.uk.amsat.org/content/view/704/283].

1 AUGUST - **KING'S LYNN ARC RALLY & CAR BOOT** - King's Gaywood Community Centre, PE30 4DZ. OT 10.00, £1.50, TS, CBS, B&B, C, CS (by prior arrangement). Ray, G3RSV, 01553671307, e-mail ray-g3rsv@supanet.com [www.klarc.org.uk].

1 AUGUST - **LORN RADIO AMATEUR RALLY** - Crianlarich Village Hall, Crianlarich, near Oban FK208QN. OT 10.30 TS, C, WIN. GM0ERV, e-mail gm0erv@sky.com or MM1AVR, e-mail stewart.mciver@btinternet.com.

8 AUGUST - **FLIGHT REFUELLING ARS HAMFEST** - Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset BH21 3AA. TI S22 (V44), CP, OT 10.00, TS, CBS, LB, C. Zetails Mike, M0MJS, 01202 883 479, e-mail hamfest@frars.org.uk [www.frars.org.uk].

13 AUGUST - **COCKENZIE & PORT SETON ARC 17th ANNUAL MINI-RALLY NIGHT** - Community Centre, Main Hall, Port Seton. Bring along your own 'junk' and sell it yourself. Tables on first come first served basis. £2 for everyone. OT 18.30 to 21.30.

15 AUGUST - **FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY** - The Frisknet Village Hall, Church Road, Friskney, Lincs, 6.5 miles south of Skegness. OT 10.00 to 14.30, £1.50, CP, C, WIN, TI S22, DIS. Details Bren, 2E0BDS, 01754 820204, e-mail felcc@btinternet.com [www.felcc.webs.com].

22 AUGUST - **WILDERN BOOT SALE** - Andover, nearest postcode SP11 0JE. OT 0900 for sellers and 1000 for buyers. £1.50, pitches £6 per vehicle, table in hall £8. TI S22, C. Maps on Andover Radio Amateur Club website www.arar.org.uk. Contact Martin Smith, 01980 612070.

22 AUGUST - NEW VENUE - NEW DATE - **RUGBY ANNUAL RADIO RALLY** - Princethorpe College, Princethorpe, Rugby CV23 9PX (SP395710). OT 10am - 4pm, £2, pitches £14 on the day. Contact Tony, 07759 684411. [www.rugbyats.co.uk].

29 AUGUST - **MILTON KEYNES ARS RALLY** - Bletchley Park, Sherwood Drive, Bletchley, Milton Keynes MK3 6EB. TI S22, TS, SIG, £2 (50p for 14 years and younger). OT 9.30. Why not make this a family day and visit the Bletchley Park museum too? Steve Goodall, G6KJU, 07866 673 192, e-mail rally@mkars.org.uk [www.mkars.org.uk].


Milton Keynes ARS rally has the attraction of a visit to the Bletchley Park museum too.

30 AUGUST 2009 - **HUNTINGDONSHIRE ARS BANK HOLIDAY MONDAY RALLY** - St Neots Community College, Barford Rd, St Neots, PE19 2SH. OT 10.00, TI, CP, CBS, B&B, C, TS, RSGB bookstall. E-mail hunts.hams@yahoo.co.uk [www.hunts-hams.co.uk].

5 SEPTEMBER - **TELFORD HAMFEST** - Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF 433.200MHz. TS, SIG, discounted admission to Enginuity Centre. Details from Martyn, G3UKV, 01952 255416 [www.telfordhamfest.co.uk].

11/12 SEPTEMBER - **GATWICK FAMILY RADIO WEEKEND** - Hunters Moon, close to Gatwick on the A217, RH6 0HU, TQ 262438. Bring some vintage(ish) radio. Military vehicles of all radio types welcome. This year the Ferret Club are coming along. The site has lots of room to erect experimental aerials, is level and congenial for a caravan, vehicle or a tent. While you play radio the family could go swimming, visit the local sports centre, Brighton or the Bluebell Railway. Saturday night BBQ and large bonfire. Mike, M1CCF, 0208 654 2582, m1ccf@talktalk.net [www.radioclubs.net/m0vog].

12 SEPTEMBER - **BOOT FAIR/OPEN DAY AT THE MUCKLEBURGH COLLECTION** - Muckleburgh Collection military museum, Weybourne, Norfolk. For one day only, admission to the museum, restaurant and shop will be free. Radio clubs, individual amateurs, military enthusiasts and general stallholders welcomed. Pitches £5.00 payable on the day. No traders. All enquiries to Bob Finch, G0HYZ, 01263 838198.

12 SEPTEMBER - **TORBAY ANNUAL COMMUNICATIONS FAIR** - Newton Abbot Racecourse, Newton Abbot, Devon TQ12 3AF. TS, B&B, C, DF. Details by e-mail to rally@tars.org.uk.

13 - 18 SEPTEMBER - **THE 15th WORLD ARDF CHAMPIONSHIPS** - Opatija, Croatia [www.ardf2010.com].

18 SEPTEMBER - NEW RALLY - **THE FOG ON THE TYNE RALLY** - Whitehall Road Methodist Church Hall, Bensham, Gateshead NE8 4LH, organised by Angel of the North ARC & South Tyneside ARS. £1.50, C. Nancy Bone, G7UUR, 0191 477 0036 (eves).

19 SEPTEMBER - NEW DATE - **GREAT NORTHERN HAMFEST** - Metrodome Leisure Complex, Barnsley S71 1AN. OT 11.00, DF, TS, SIG. Details Ernie, G4LUE, 01226 716339.

26 SEPTEMBER - **HOLSWORTHY AMATEUR RADIO RALLY** - Holsworthy Community College, Victoria Hill, Holsworthy EX22 6JD. TI V36 (S18). Details Roger Williams, 07773 983691, e-mail g8yrw@yahoo.co.uk.

26 SEPTEMBER - **50 YEARS OF AMATEUR RADIO HISTORY GARAGE SALE** - from the estate of G3IOZ (SK). Extensive valve collection, WW2 and vintage equipment, parts. Close to M40 J4 (High Wycombe). Details from Larry, G4GZG, by e-mail to g4gzg@yahoo.com.

26 SEPTEMBER - **BELGIAN NATIONAL AMATEUR RADIO & COMPUTER RALLY** - Exhibition Centre, Charleroi, Belgium. OT 09.00. International TS, FM. Details Michel, ON7FI, on 0032 64 849 596 or by e-mail to michel.dewyngaert@skynet.be [www.on6ll.be].

1 & 2 OCTOBER - **NATIONAL HAMFEST** - brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). OT 10.00, TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB Bookstall, RSGB Services & Committees, DF, FM [www.nationalhamfest.org.uk].


The National Hamfest attracted visitors and traders from far and wide.

3 OCTOBER - **AUTUMN MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE** - Hack Green secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, £2.50. Contact Rod Siebert, 01270 623353 or e-mail coldwatr@hackgreen.co.uk [www.hackgreen.co.uk].

8-10 OCTOBER - **RSGB CONVENTION** - Full convention programme with lectures for all interests and all levels of technicality [www.rsgb.org/rsgbconvention].


October's RSGB Convention moves to a larger venue because last year some talks were standing room only.

17 OCTOBER - **BLACKWOOD AND DISTRICT ARS RALLY** - Coleg Gwent, Risca Road, Cross Keys NP11 7ZA.TI S22, CP, OT 10.30/10.40, £2. TS, B&B, SIG, C, WIN. Details Dave, GW4HBK, 01495 228516, e-mail gw4hbk@talktalk.net [www.gw6gw.co.uk].

17 OCTOBER - NEW DATE - **HORNSEA AMATEUR RADIO CLUB RALLY** - Floral Hall, 7 The Esplanade, Hornsea, East Yorks HU18 1NQ. OT 10.30, CP, TS, B&B, SIG RSGB, RAFARS, LB, C, DF, WIN. Details from Rick, M0CZR by e-mail to R106221@aol.com or Duncan, G3TLI, e-mail g3tli@hotmail.co.uk [www.hornseaarc.co.uk].

17 OCTOBER - **GALASHIELS AND DISTRICT ARS RADIO RALLY** - The Volunteer Hall, St Johns Street, Galashiels, Scottish Borders TD1 3JX. OT 11.00/10.45, £2.50. B&B, TS, C, WIN. Details from Jim, GM7LUN on 01896 850245 or e-mail mail@gm7lun.co.uk.

30 & 31 OCTOBER - **NORTH WALES RALLY** - John Bright School, Llandudno. TS, RSGB Bookstall, CP. Details from Liz Cabban, GW0ETU on 01690 710257 or e-mail lizcabban@vodafoneemail.co.uk.

7 NOVEMBER - **WEST LONDON RADIO & ELECTRONICS SHOW** (Kempton Rally) - Kempton Park racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. OT 10.00. TS, FM, DF, CP free, RSGB, LEC, TI S22 (V44). Paul, M0CJX, 0845 165 0351, info@radiofairs.co.uk [www.radiofairs.co.uk].

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the email address.
2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or membership number, telephone number and postal town, in that order.**
3) The Ad may not contain more than 40 words, excluding the information in (2), and may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

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 money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

RADCOM MEMBERS' AD REQUEST FORM

Only use this form if you are unable to send your advert by e-mail. E-mailed adverts are free. A charge of £5 is made to cover administration costs for Members Ads submitted by post. Photocopies of this form are acceptable. Posted ads must not exceed 40 words. Please fill in all details, especially your name, callsign, phone number, town and your signature or your advert may not be accepted.

☐ I enclose a cheque for £5 payable to RSGB

☐ Please charge £5 to my credit card

Number

☐☐☐☐-☐☐☐☐-☐☐☐☐-☐☐☐☐

Expiry date MM-YYYY

Issue number (Switch only) ☐☐

Name

Callsign

Phone

Town

Signed

Date

Section: ☐ FOR SALE ☐ WANTED

SPECIAL EVENT STATIONS FOR AUGUST 2010

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. Details published here are kindly provided by Ofcom.

The QSL Bureau sub-manager for all special event station callsigns (GBxAAA-GBxZZZ) is Mrs Davina Williams, M0LXT, 20 Neale Close, Wollaston, Northamptonshire, NN29 7UT, e-mail QSLTREK@hotmail.co.uk, web site www.gb-special-event-qsl-status.webs.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with M0LXT?

Date	Callsign	Phonetics	Location	Bands	Keeper
01/08/2010	GB6TPR	The Princess Royal	Ormesby, Norfolk	LH	G4OHX
	GB4BPL	Burry Port Lighthouse	Burry Port, Wales	LHV	G3CEN
	GB2YD	Yorkshire Day	Maltby, Rotherham	LHV27	G1PQW
08/08/2010	GB4MF	Maltby Festival	Maltby, Rotherham	LHV27	G1PQW
13/08/2010	GB1HA	Headcorn Aerodrome	Headcorn, Ashford, Kent	TLHV27	G0UXG
	GB2STC	Series Two Club	Milnthorpe	TLH2	G7VOQ
	GB2PF	Peter Fidler	Chesterfield, Derbyshire	TLV27	G0THF
	GB0HCR	Hylton Castle Re-enactment	Sunderland	LH27	M5GHT
14/08/2010	GB2SLH	Sumburgh Lighthouse	South Mainland, Shetland	TLH2	M5YLO
	GB1OL	Orkney Lighthouse	Westray, Orkney Islands	TLHV27	MM5DWW
15/08/2010	GB4NPL	Nash Point Lighthouse	Vale of Glamorgan	LH2	GW0JTY
16/08/2010	GB0GCC	Glorious Cannock Chase	Cannock Chase	TLHV27	G8VPR
18/08/2010	GB5HL	Hartland Lighthouse	Devon NGR SS235274	LH2	M0HWK
19/08/2010	GB1SLB	Sunderland Lifeboat	Sunderland	TLHV27	M1FNE
	GB2KLH	Killingholme LightHouses	Killingholme, N Lincs	LH27	G4YHP
20/08/2010	GB2PSL	Plover Scar Lighthouse	nr Cockerham Abbey	LH27	M0ECH
	GB0MMH	MMH= call sign of Spurn Lightship	Hull	TLH27	M0MAO
	GB2SL	Spurn Lighthouse	Spurn Point	TLHV27	G7LRR
	GB0ELH	Eshaness Lighthouse	Shetland Islands	LH	MM5PSL
	GB2WLH	Withernsea Lighthouse	Withernsea	TLHV27	G4HYY
	GB1DLH	Dungeness Lighthouses	Dungeness, Kent	LHV27	M0SSR
21/08/2010	GB2LBN	Barns Ness Lighthouse	Dunbar, East Lothian	LH	GM4UYZ
	GB0BMB	Beaulieu Millennium Beacon	Lepe, nr Southampton	TLH27	G4YVY
	GB2BTL	Belle Tout Lighthouse	Beachy Head, Eastbourne	LH2	M0LRE
	GB5RRR	Rugby Radio Rally	Rugby	LH27	G7BQM
	GB0PL	Paull Lighthouse	Paull, E Yorkshire	LH2	G4VHM
	GB2LSA	Lighthose St Ann	NGR: SM805029	LH27	GW3CR
	GB2SCA	Scarborough Lighthouse	Scarborough, Yorkshire	LH2	G4SSH
	GB2SL	Lighthouse Southerness	Southerness, Galloway	LHV27	GM0HPK
	GB2WHL	Whitby High Light	Whitby, Yorkshire	TLHV27	M0GGR
	GB0MOG	Mull Of Galloway (Lighthouse)	Galloway, Scotland	LH	G0PFH
26/08/2010	GB4MO	Military Odyssey	Detling, Kent	LHV27	M1CCF
	GG100HAM	Hambleton	Thirsk	LHV27	G1JKE
27/08/2010	GB1HA	Headcorn Aerodrome	Headcorn, Ashford, Kent	TLHV27	G0UXG

The Kempton rally always sees a good mix of traders.

SATURDAY 13 NOVEMBER - ROCHDALE & DISTRICT RS TRADITIONAL RADIO RALLY - St Vincent's Church Hall, Caldershaw Road, Rochdale OL12 7QL. OT 10.15/10.30am, £2.50 concessions for under 12 and seniors, B&B, C, Tables only £5. All vendors are encouraged to bring along all their radio related 'junk' with construction in mind. No computers (well, maybe a couple!). Details Dave, G0PUD, QTHR, 07710 243107, e-mail dave.shaw1@sky.com. [www.radars.me.uk].

21 NOVEMBER - 33rd CATS RADIO & ELECTRONICS BAZAAR - 1st Coulsdon Scout HQ, r/o Council Car Park, Lion Green Road, Coulsdon, Surrey. 10.00-13.00, £1, B&B, C, DIS, DF, CP free. Details Andy, G8JAC, e-mail secretary@catsradio.org.

21 NOVEMBER - PLYMOUTH RADIO CLUB RALLY - Elm Community Centre, Leypark Walk, Estover, Plymouth PL6 8UE. CP, TI, OT 10.00, £2, TS, B&B, C, WIN.

28 NOVEMBER - BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY - Spennymoor Leisure Centre, Co Durham DL16 6DB. CP, TI S22 (V44), OT 10.15/10.30, £1.50 (U14 free). TS, B&B, C, LB, DF, FAM. Details Mark, G0GFG, 01388 745 353.

6 FEBRUARY 2011 - 26th CANVEY RADIO & ELECTRONICS RALLY - 'The Paddocks', Long Road, Canvey Island, Essex SS8 0JA [southern end of A130]. Free CP, OT 10.30, £2, C, DF, TS. Dave, G4UVJ, 01268 697978 (evenings) [www.southessex-ars.co.uk].

19 MARCH 2011 - LAGAN VALLEY ARS RALLY - The Village Centre, 7 Ballynahinch Road, Hillsborough. OT 11.30, TS, CP, C. Contact Jim, GI0DVU, 02892 662270, e-mail jim.henry@ntlworld.com.

20 MARCH 2011 - 27th YEOVIL QRP CONVENTION - Digby Hall, Hound Street, Sherbourne, Dorset DT9 3AA (adjoining the central shopping car park). OT 9.30am, TI S22, CP, TS, LEC, B&B, C, DIS. Contact Derek, M0WOB, 01935 414452.

26 JUNE 2011 - WEST OF ENGLAND RADIO RALLY - "Cheese & Grain", Bridge Street, Frome, Somerset BA11 1BE. TS, RSGB Books, C, CP, DIS. Contact Shaun, G8VPG, 01225 873 098, e-mail rallymanager@westrally.org.uk [www.westrally.org.uk].

This list shows all rallies and events we are aware of as at 7 July 2010. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e–mail (to GB2RS@RSGB.org.uk) then we suggest you set your e–mail program to request a 'read' receipt so you can be sure we've seen the details.

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.

RadCom

HF F-Layer Propagation Predictions for August 2010

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	6.....777	73.....5888	.7.233.28884	..67777788..	...6776677..	.....	.....	.....
*** Asia								
Yakutsk	.....	.....	53.....45666	..666665345.	....4.....	.....	.....	.....
Tokyo	.....3..	.....58..	.....4..	.....	.....	.....	.....	.....
Singapore	.....22.	.....1787.	.....55..	.....3...	.....	.....	.....	.....
Hyderabad	.....	444	3554	.....334..	.....	.....	.....	.....
Tel Aviv	94.....2899	983....48999	..4....58883	...44...78..	.....55..	.....	.....	.....
*** Oceania								
Wellington	.....	.....	.....	.....	.....	.....	.....	.....
Well (ZL) (LP)	.....	.77.....8..	789.....887	668.....697	.....5.	.....	.....	.....
Perth	.....	.....552.	.....53..	.....	.....	.....	.....	.....
Sydney	.....	.....366..	.....555..	.....	.....	.....	.....	.....
Melbourne (LP)	.....	.898.....	78994.....6	6..8.....68	77	.....	.....	.....
Honolulu	.....	.....	..43.....	....3.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....5...	.....	.....	.....	.....
W. Samoa	.....	.....	...2.....	....33.....	....44.....	.....	.....	.....
*** Africa								
Mauritius	1.....222	3.....6876	8873	.....5773.	.....54..	.....	.....	.....
Johanesburg	.....	.....43.	9974	.....697..	.....5...	.....	.....	.....
Ibadan	11.....11	67.....666	674....5776	..7....3787.	...6....88..	...5....88..	.....66..	.....
Nairobi	.....	5.....555	54.....4666	.....3666.	.....566..	.....64..	.....	.....
Canary Isles	771.....677	887.....3888	8785...37888	..54....8886	....99889998.	....777689..	.....6..	.....
*** S. America								
Buenos Aires	.....	324.....3	647.....77	574	.....	.....	.....	.....
Rio de Janeiro	.....	433.....56	656.....888	885	.....4..	.....	.....	.....
Lima	.....	323.....3	6353.....77	75	.....	.....	.....	.....
Caracas	.....	221.....3	7575.....78	....5....687	.....3..	.....	.....	.....
*** N. America								
Guatemala	.....	212.....	5252.....6	43	.....	.....	.....	.....
New Orleans	12.....	664.....3	633.....6	63	.....	.....	.....	.....
Washington	43.....	775.....6	75.....58	3344676	.....	.....	.....	.....
Quebec	65.....5	773.....58	477	.....665.	.....	.....	.....	.....
Anchorage	.....	.....	354.....345	.....476.	.....6.	.....	.....	.....
Vancouver	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....	.....	.....	.....

KEY: Each number in the table represents the expected circuit reliability, eg '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 www.rsgb.org.uk/propagation/index.php. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for August, September and October are respectively (SIDC classical method – Waldmeier's standard) 21, 23 & 25 and (combined method) 38, 44 & 49. The provisional mean sunspot number for June was 13.5. The daily maximum / minimum numbers were 33 on 11 & 12 June and 0 on 15 & 16 June.

CLASSIFIED ADS

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, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

FOR SALE

ISOLATED DATA INTERFACES for PSK31-SSTV-RTTY-CW-FSK-WSJT etc. ALL PREVIOUS MODELS STILL AVAILABLE, See RSGB Reviews SEPT 09 RADCOM. AVAILABLE. PAYPAL REGISTERED. www.g3liv.co.uk johnny@melvin.com 0191 2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

PROGRAMMING AND DATA MODE CABLES for Icom, Yaesu, Kenwood, Ten-Tec, Motorola, Vertex, and many other brands at www.radioarena.co.uk Tel. 0845 0942245 info@radioarena.co.uk

SDR RECEIVER 40 / 30M, 30M OR 80M versions £49.95 plus postage Check our website for our range of amateur radio products Cross Country Wireless 01204 410626 www.crosscountrywireless.net

X-TALS 3.560/7.030/10.106/10.245/ 14.060MHz £5-95/set Pr Carrier 10.7MHz +/- 1.5kHz, 9.0MHz +/-1.5kHz £3-95/pair 7x9MHz Matched ≤30Hz £6-95/set P&P £1-50 + VAT. Many freq ex-stock. vincentvoy@hotmail.co.uk 0208 391 0545

CARDS & DESIGN

QSLERS 100 FULL COLOUR CARDS £24 including Design and Postage, 1000 full colour cards £75 inc Postage, m0dol Chris 24 Westridge, Northampton nn27ra

QSL FACTORY: top quality colour QSL cards. www.qslfactory.com

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.com

AERIALS

G4TPH HAS NOW DEVELOPED the ML-6-2 Portable Magloop for am, The SOTA special. Contact tom@g4tph.com for full details.

THE ROTARY DUAL BEAM PRO 40-10 A break through in compact antenna design,16ft overall www.proantennas.co.uk

GROUND MOUNTED I-PRO HOME 40-10 5m tall Vertical Dipole, easy lay flat design. www.proantennas.co.uk

YAGI ANTENNA INSULATORS - Insulators from £1.50 each. Free Yagi Designs and more insulator info at www.g0ksc.co.uk

PALSTAR POWER SUPPLIES from 3 to 50 Amp – 10% discount this month On Line at www.nevadaradio.co.uk

ECOFLEX ULTRA LOW LOSS COAXIAL cables & connectors, at NEVADA www.nevadaradio.co.uk

LDG & MFJ TUNERS – Big stocks, Best prices & Fastest delivery, On-line at Nevada www.nevadaradio.co.uk

PORTABLE 2M ANTENNAS from £24.95. The choice of experts. Ideal for SOTA! Details www.sotabeams.co.uk Telephone 01625-425700.

M0CVO ANTENNAS HF, VHF and UHF antennas, fixed or portable. Full details at: http://www.m0cvoantennas.co.uk

WANTED

UNWANTED VALVE AMPLIFIERS, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Cash paid. Contact Peter G3ZRS on 01482 862323 or e-mail: g3zrs@hotmail.co.uk

MISCELLANEOUS

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147Khz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.dunnethead.iberacal.com Email: briansparks@dunnethead.co.uk

EQUIPMENT

VHF/UHF ACCESSORIES and aerials, TVI Filters, 4m & 6m Transceivers. GAREX ELECTRONICS PO Box 52, Exeter EX4 8WX Tel: 07714 198374 www.garex.co.uk

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376 email: radiorepairs@btconnect.com

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE FOR YAESU RADIOS. http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

CONTEST LOGGERS - SD by EI5DI. RSGB and international contests. HF €25, VHF Free. www.ei5di.com

BUSINESS CARDS

CLASSIFIED ADS

RADIO BY NUMBERS

Geoff Stainton, G1MQQ

I was dismayed recently to hear an M6 station being berated by an HB for not giving him a signal report. The HB pointed out in no uncertain terms that it was the most important part of the QSO and should always come first. He was seemingly oblivious of the fact that the raw data meant nothing.

I must confess I lost my cool and returned his next CQ, demanding to know his precise receiver configuration (pre-amp/attenuator in use), his aerial system and orientation as well as his precise geographical location, pointing out that without this information the numbers were meaningless. He took my point but I doubt if I'm on his list of favourite stations.

I also hear with dismay stations running 1kW plus into multi-element beams on 75ft towers halfway up the Rockies expressing disbelief that 'My signal report is only S7', knowing nothing and caring less, of the receiving station's situation. He may be at the bottom of a hole in a built up area using a piece of wet string for all he knows. Having received the report they obviously so covet, 'you are 59 plus 20'. I have yet to hear one reduce power!

Surely signal reports as usually given are nothing more than an indication to the station of how well he can be copied. Why not drop the S and just report the Q?

We seem to be increasingly entering an era of 'Never mind the quality, look at the size of it!'. Or am I just getting old?

OFCOM EXPERIENCE

Julian Woolvin, M0JPW

With regard to the letters last month regarding PLT and the lack of response by Ofcom. From personal experience I would have to say that what Ofcom might be saying at a national level and what is happening at a local level are completely different.

Back in February I became aware of terrible PLT interference coming from a neighbouring property. It was obvious from the sound that it was a Comtrend unit, most likely a BT home vision system and the interference was covering most of the HF band from 2MHz up to 28MHz (although they had been notched for the amateur bands). In despair I got out the trusty old portable short wave radio and went hunting! It was soon apparent that the signal was coming from one of two possible addresses, but the interference was also radiating out of my own house wiring and the nearby street lighting via the incoming mains supply.

Without wanting to start knocking on doors I went online to the Ofcom website and filled in an online complaint form. The following day I received a phone call asking me for further information and was given a case number. Within a further two weeks I was contacted by a local Field Officer who took more details and promised to look into the problem as soon as possible. Over the next two months I received regular updates on their progress in this matter and on 14 June an e-mail arrived stating that the offending devices had been removed and would I check that the interference had stopped, which upon doing so it had.

So as far as I am concerned the local boys can do no wrong! With regard to Ofcom's national policy on the subject of PLT and the future protection of our precious radio spectrum none of us can afford to sit back and be complacent and all our resources must be brought to bear until common sense prevails.

So next time you are at a rally and see the Spectrum Defence Fund tin being rattled please spare a few coppers to help preserve our great hobby.

WHAT HAPPENED TO ROGER?

Steve, EA5FJF *[Also G0JFM & G1YOU]*

G1MQQ seems to think the Queen's English is the only way we should 'talk' on the radio.

I was also a 'G1' and I was taught to put out a CQ call in the form he dislikes so much, ending "G1YOU calling and by" which I was told was short for "G1YOU calling and [STANDING] by [FOR A REPLY]." It was just shortened to save time – everybody understood it. And still understand it.

Come on Geoff. I could criticise your threatened "G1MQQ returning…." which is also an abbreviation. For heaven's sake live and let live. There are too many grumpy old timers out there.

Richard Dimmock, G1HIJ

I read Mr Greggs letter. Publishing this sort of 'mightier than thou' letter only leads to even more snobbishness that unfortunately prevails in certain quarters.

I suffered this on becoming a B licence because according to some I was not a real ham because I had not passed the CW (hearing problems because of Army service). Now the M6s are bearing the brunt of the 'Holier then thou' brigade, and this must be stamped out more sooner rather than later.

As long as we are speaking on the radio and the other person can understand what is said that is what important not picking up someone's grammatical errors.

PLANNING

Janet & Colin

We read with great interest the recent article on applying for planning permission and thought you might enjoy our story on applying for planning permission.

In January 2005, my husband and I moved (he is a G0 and I am a M3). We submitted our application for our mast (10m when extended with 6m, 2m and 70cm beams only) and a conservatory with architect's drawings to our local council.

I went across to our neighbour lived across the street who would see them the most and explained what we were doing and showed her the plans and said she had no need to worry as she would hardly see them.

She asked if she could borrow them as her husband was out (bad mistake). She shouted at us the next day and said she had a few questions. As Colin explained all she wanted to know, she came and looked were we were going to put them and she then told us they were going to be an eyesore and why could we not have gone to live in a field away from other people or give up our hobby. She then said she was going to object at this point.

A few days later the council called, our neighbour had drawn on our drawings, which she had photo copied and sent the amended drawings to the council. We had no idea she had done this, the council asked us to resubmit the drawings.

She went all down the street and surrounding area and got 35 objections against our aerials and told every body they would be seen all over our village and they were the size of GCHQ and would fill our and surrounding gardens. They would devalue their property and would interfere with their TVs. She stood over one lady while she wrote the letter and even told some people what to put.

The Parish council meeting was held and they were discussed for 45 minutes with her leading the debate (we did not attend as we were away). The Parish council turned them down. She went round all the radio amateurs in the Scarborough area taking photos of their aerials and had meetings at our front gate. She was sure a woman on a mission!

We got our planning permission but with restrictions and only in Colin's name for the aerials but both names for the conservatory. The restrictions were that we had to ring the council when we wanted to use them and could only broadcast at night. Also the permission was only in Colin's name and would cease when he left the property, but it was a joint application. I rang to ask why it was only in Colin's name and was told we would have to reapply at a cost of another £130.

We went to appeal. Never be afraid to go to planning appeal as they are very fair.

Everybody who objected was written to – and guess who was the only one to respond? Our lovely neighbour.

The day of the appeal arrived and they sent a representative from the council with the Appeals Officer. At 10.15 she and her husband and son were sat outside waiting for them to arrived. They arrived at 10.30 and rang our bell and asked if we would go outside to discuss the case. By now our neighbour was stood at our gate. I refused to come out while she was involved, but he said if we did not come out he could not hear the

case. The council showed our plans and we had to confirm that we had submitted them. He then asked if he could look at the aerials to which we replied yes. We were asked to put the aerials up to their full height and he made notes and said he would be back. They went over the road and looked across from her house. He came back and said (with a lovely smile) we would hear in two weeks.

We got our full planning permission and it was granted to the property in both our names – it is against the law to give individual planning permission it should be against your property. Then 6 months later our neighbours moved. Hurray!

We invited out new neighbour to come across and see the aerials and he said "What aerials? I have not even noticed them".

So the moral of the story is don't give up, keep fighting, you will win.

Unless your proposals actually are a 'monstrous carbuncle' on the landscape I would always recommend that members consider making a planning appeal. The process is free and it's just a matter of filling out the appropriate form. The process can even be done online these days.

The Planning Advisory Committee can supply Members with a suggested text for the appeal form. Success rates for members using this text is currently over 70%, twice the success rate of planning appeals in general, so it's well worth a go.

Len Paget, GM0ONX, Chairman, Planning Advisory Committee

ARTICLES IN RADCOM

C P Williams, G8SFD

I would like to see more articles in *RadCom* that are suitable for beginners in electronics. It would be nice to revisit some simple low power transmitters using just a few semiconductors and producing around a watt or so of power – much less likely to produce RFI or TVI if something is not right the first time. Simple projects get people into electronics and if parts need to be substituted, it's likely to be easier. There's nothing worse than spending ages building a complex project and not being about to get it to work. This just destroys the confidence in ones ability to construct things. Not everyone has access to expensive test equipment or the tune to make double-sided or multi-layer PCBs.

We do try very hard to include technical content ranging from the simple to the most complex, and understand that some people's facilities are limited. Our regular four page Homebrew column shows what can be done without PCBs; many of the projects we have featured recently do not require PCBs other than perhaps for convenience.

There are a couple of simple transmitter projects in the pipeline and we would also be delighted to hear from anyone that has a simple project they think might interest others. Don't worry about writing an article first – just get in touch and tell us a bit about what you have in mind.

Giles Read, G1MFG, RadCom Technical Editor

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 not to 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.

THE WORLD AT YOUR FINGER TIPS

Kevin Jennings from Cray Valley Radio Society

How many people can you manage to contact over a 48 hour period in September? Do you have a great radio location and all the equipment imaginable or something far more modest…knowledgeable about band conditions, able to stay awake and alert or have a relay of enthusiastic and experienced operators able to pick out that rare DX in amongst the noise… "CQ, CQ, CQ"... just who is going to reply... a farmer from Kent, an engineer from China, a banker from the Cayman Islands or a park ranger from Florida… who knows?

This is the all part of the fun of Transmission 2010, British Wireless for the Blind Fund's annual sponsored contacts competition. As an individual can you beat last year's winning score of 802 contacts? As a club can you beat the winning score of 1113 contacts?

It is not just about making the contacts, but raising money for a very worthwhile cause… be creative, perhaps try and raise the most money by showcasing amateur radio in a prime public location that will raise awareness of the work of BWFB and have captivated onlookers emptying their pockets… opportunities, opportunities.

Radio communication is an essential part of 21st century life – to a person living with sight loss their radio can be their world. Helping BWBF to supply radios to blind and partially sighted people in need is all about keeping them in touch with what is going on in the world.

Go on, take up the challenge and help make a difference by supporting the BWBF.

OLD-TIMERS MEMORIES

Ron Hacker, G1DER

In the late fifties I was in the Army stationed in Cyprus on top of Mt Olympus at 6403ft ASL and a couple of RAF lads started a Ham Club, callsign ZC4MO (you could choose your own callsign). An HF rig was built out of scrap military equipment and stood around 5ft high but only capable of 60W.

Later we got interested in 2m. Chalky Whiting, ZC4CW lived on the coast near Limassol and had been transmitting for around two years and never managed to contact anyone. He kindly built us a converter for our old AR88 and we built a transmitter on AM and a Yagi. You can imagine ZC4CW's joy when we first made contact.

Then Johnny Bull, ZC4JB and Pat West, ZC4PW, both living in Nicosia, also got on 2m. ZC4JB built a small 2m rig and fitted it in his car using a halo antenna fitted on his bumper. Unfortunately he was crystal controlled on 144.177, we could hear him but he could not hear us as all our transmitters were crystal controlled. Over a period we ground our crystals using a piece of glass and Brasso. After many attempts and non working crystals, ZC4JB reported that he could hear us. From then on he drove around Cyprus testing. On top of Mt Olympus we could hear him most of the time but on the coast ZC4CW had difficulty.

During winter our living accommodation (Nissen huts joined together) got completely buried under snow along with many of our aerials, military and amateur, but we somehow managed to still get contacts. Other than our Cyprus hams we only managed to make contact with Tel Aviv and a French monk in the mountains of Lebanon.

No 'black boxes' in those days, every thing we had was made from scrap or ex-WD bits, and when things work what joy but great problems when they didn't.

At one time we held a weekend 'field day' on the opposite peak when we suffered too much QRM from our military equipment on Olympus. We invited some American hams because they were not allowed to be licensed in Cyprus.

We were hoping to get further than Lebanon so we pointed the aerials down the Med hoping to get to the island of Rhodes but with no success. We did get a report that we had been heard in Borneo but that his transmitter was not working. This report had been passed from ham to ham on HF. It would have been a great achievement if we could have managed a QSL.

I wonder if any of these hams are still active?

WATERS & STANTON

Orderline 01702 206835
General Enquiries 01702 204965

W&S On The Internet! We Twitter at twitter.com/wsplc
(We also Blog and have a Facebook account ~ Just follow the links from our homepage)

Diamond
VHF/UHF Antennas


A144S5R	5el 2m 9.1dbi 0.95m L	£45.95 D
A144S10R	10el 2m 11.6dbi 2.13m L	£84.95 D
A430S10R	10el 70cm 13.1dbi 1.19m L	£49.95 D
A430S15R	15el 70cm 14.8dbi 2.25m L	£65.95 D
SB144	Boom for dual 2m Yagis	£24.95 A
SB430	Boom for dual 70cm Yagis	£19.95 A
SS144	Stack transformer 2-way 2m	£81.95 C
SS430	Stack transformer 2-way 70cm	£71.95 C
KB144	Mast stand-off for vert. polarise	£18.95 A
KB430	Mast stand-off for vert. polarise	£15.95 A

Create
Rotators

RC5-1 Medium Duty Rotator

Rotating torque: 6kg/m *Braking torque: 80kg/m *Mast size: 48-63mm *Vertical load 400kg *Horizontal load 800kg *Rotation speed: 60-150sec/50Hz *Power requirement: 230V AC 80VA *Weight: 5kg *Cable: 7-core cable (not supplied) *Requires MC-2 lower mast clamp if mounting on pole* **£499.95 D

RC5-3 £599.95 D
Same as above but with preset control.

RC5A-3 £819.95 D
Same as above but heavier duty.

bhi
DSP Audio Equipment

ANEM-MkII
"Noise Away" Amplified Noise Elimination Module. Fits in-line between the equipment & speaker. **£124.95 C**

NES10-2 MKII
Speaker and programmable DSP unit. Offers dramatic noise reduction. **£99.95 C**

NEIM-1031MKII
Noise Eliminating In-Line Module. **£139.95 C**

NEDSP-1061/2-KBD
NEDSP-1061-KBD - Noise Eliminating DSP module fits into FT-817 etc.
NEDSP-1062-KBD - Noise Eliminating DSP module fits into Loudspeaker.
(1061) **£99.95 C** (1062) **£104.95 C**

DV-Dongle
D-Star from your PC

This is a "dongle" that you plug in your PC or Macx USB socket. Load up the software and enjoy working through D-Star repeaters all over the world. Great fun for holidays, office etc. **£199.95 C**

Microset
Amplifiers & Power Supplies

SR-100
2m 4-25w in linear for 100W output. **£259.95 C**

R-25	2m 1-4Win / 30W out	£119.95 C
RV-45	2m 3-15W / 45W out	£129.95 C
VUR-30	2m/70cms 1-6/20-30W	£269.95 D
RU-20	70cms 0.8-3 / 15-20W	£169.95 C
RU-45	70cms 3-15 / 45W	£219.95 C
RU-432-95	70cms 6-12/80-95W	£599.95 D

Check out other models @ www.wsplc.com

PC-120
20 Amp variable Power Supply. **£179.95 D**

MOTOROLA We carry a wide range of Motorola licence free radios & approved PMR radios. Check www.wsplc.com

Optoelectronics
Frequency Counters

CUB
A compact highly accurate frequency counter covering 1MHz -2.8GHz.Comes complete with battery pack and charger. **£149.95 C**

Scout	10-400MHz 400 memos.	£339.95 C
V-Sweeper	Wireless video 900 - .5GHz	£649.95 D
X-Sweeper	FM spectrum display scan	£1679.95 D
R-506	RF detect AM/FM to 6GHz	£264.95 C
Spectrum-Scout	10 - 2.8GHz + data display	£459.95 C
M1	10Hz - 2,4GHz counter	£259.95 C

WATSON **NEW**

W-2001 Internet Wireless Weather Station

- *5-day Forecast*
- *Date & Time*
- *World Weather*
- *Backlit LCD*
- *Wireless Link*
- *PC Dongle*
- *Outdoor Sensor*

The W-2001 gives a 5-day forecast for anywhere in the world! The clear LCD screen is wireless linked to your PC via a dongle. Just press the LCD screen panel command and it will interrogate your PC, display and store the results on the wireless linked weather display panel. So you can monitor your local weather trends directly and see an accurate 5-day forecast.

Just £49.95 C

Watson
Power Supplies

Power-Mite-NF

Compact Cont. 22 Amp Switch Mode PSU variable voltage & noise offset. **£69.95 C**

Power-Max-25-NF

Slightly larger than the Power-Mite and ideal companion for any 100W radio. **£89.95 C**

Power-Max-45-NF

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset. **£119.95 C**

Power-Max-65-NF

65 Amp Low Noise power supply. Patented Noise Control that permits you to move any noise away from the operating frequency.

£209.95 D

W-25AM

A really hunky, reliable 25 Amp variable supply that easily runs 100W radios with power to spare. **£89.95 C**

W-3A	3A Analogue fixed 13.8V	£24.95 C
W-5A	5A Analogue fixed 13.8V	£29.95 C
W-10AM	10A Analogue variable	£59.95 D
W-10SM	10A Switched fixed	£49.95 D

Samlex
Power Supplies

SEC-1212

Switch mode PSU offers 10A of cont. current output & 12A peak. Ideal for low power, designed with RF in mind, it is totally noise free & utterly stable. ** Input 230V AC * Output 13.8V DC * Output current 10A cont (12A peak) * HF & VHF filtering* **£79.95 C**

SEC-1223	23A Cont S/Mode	£99.95 C
SEC-1235	30A Cont S/Mode	£149.95 C

Kent
Morse Keys

Hand-made quality morse keys. Fell the difference!

KSKA	Standard straight key	£79.95 C
KSKB	As above in kit form	£59.95 C
KSKK	As above less base	£49.95 C
KT1	As KSKA but steel base	£89.95 C
KTPA	Iambic paddle key	£94.95 C
KTPK	As above but in kit form	£79.95 C
KENT-TWO	Paddle & Straight	£89.95 C

Avair
Power SWR Meters

Great Value Superb Performance!

All models have 12V backlight and include DC Cable.

AV-201 £49.95 C
1.8-160MHz, 5/20/200/1kW

AV-400 £49.95 C
140-525MHz 5/20/200/400W

AV-601 £69.95 C
1.8-160MHz / 140-525MHz

AV-1000 £79.95 C
1.8-160MHz, 430-450MHz, 800-930MHz, 1240-1300MHz. 5W, 20W, 200W, 400W.

Cross Needle Models - Even Lower Prices!

AV-20 £34.95 C
30W / 200W, 3.5-150MHz

AV-40 £34.95 C
15W, 0-150W, 144-470MHz

Watson
Dummy Loads

They feature high tolerance, air-cooled housings with extremely efficient heat ducting. This results in a realistic continuous power rating, together with an impressive VSWR curve.

DM-150PL £34.95 C
DC-1GHz PL-259 30W cont 100W 90 secs

DM-200N £49.95 C
DC-3GHz N-Type 35W cont 100W 2 mins

Ramsey
Kits

CW-7C
A complete CMOS CW keyer kit with case and knobs. **£35.95 B**

FR-146C	2m FM receiver + case	£44.95 C
FR-6C	6m FM receiver + case	£44.95 C
QRP-20C	20m 1W VXCO Tx +case	£39.95 C
QRP-40C	40m 1W VXCO Tx +case	£39.95 C
QAMP-20C	20m 20W linear +case	£49.95 C
QAMP-40C	40m 20W linear +case	£49.95 C
RFS-1	RF switch 1-100W	£22.95 C
SS-70C	Speech scrambler	£39.95 C

Miracle Antennas
Miracle-Whip

A tuneable telescopic whip covering 3.5 to 460MHz. Up to 25 Watts PEP, fiited with PL-259 plug. Great for FT-817 & IC-703 or any other QRP radio. **£109.95 C**

Ducker £109.95 C
HF Mini ATU for helical whips

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

UK'S LOWEST PRICES

www.wsplc.com

www.jayceecoms.com

W&S are proud to be sole UK Heil Distributors!

Joe Walsh Uses Heil

Joe Walsh, ham operator and guitarist in world famous rock group The Eagles, uses Heil microphones on stage and in the shack. If it's good enough for him!

Heil Sound Provide Reliability and Performance!

NEW Proset-Elite-6

The ProSet-Elite 6 uses the new HC6 element that is ideal for the latest transceivers with DSP tx audio EQ. Heil have published a list of recommended EQ settings for many popular radios.

Designed in the style of previous ProSets, you get dual head-phones & adjustable boom mic. You need to add the appropriate AD-1 adaptor lead. Tell us your radio and we will supply correct one. **£179.95 C**

For Icom radios, choose **ProSet Elite-6-IC**. You get the same functions but element is matched for Icom. **£194.95 C**

ProSet continues for those who don't have EQ in their radios and is offered at a great price.

ProSet-4 or 5 £114.95 C
This is fitted with HC-4(DX) or HC-5 (Normal) insert. Needs AD-1

ProSet-Plus £189.95 C
This has dual inserts switchable

Professional Studio

Check out the PR-20, PR-22, PR-30, PR-35 & PR-40 on our web site. They are professional studio mics designed for high SPL recording and stage work. They sound like condenser mics, but have the advantage of dynamic mics.

Mic Bases for base mics.

CB-1(H) is for all stick mics. **£46.95 C**

CB-1PTT is the same but with PTT **£59.95 C**

Traveller Series

For portable or mobile use, the HTSS has a single earpiece, the HTDS a dual earpiece. Both have boom mics & in-line PTT switching and up/down for equipped radios. You will need to purchase the matching HSTA lead to suit your radio.

HTDS Dual Earpiece Headset £79.95 C
HTSS Single Earpiece Headset £69.95 C
HSTA Rig adaptor leads £24.95 A

Quality Base Mics

PR-781

A high quality microphone for the discering ham, designed by Heil to excel Requires CC-1 cable kit for rig. **£129.95 C**

GM-4 & 5

These "Gold Lime" mics contain the NC-4 or NC-5 capsule. Can be handheld or mounted on a stand (clip supplied). Requires CC-1 cable kit for rig. **£119.95 C**

HM Handy Microphones

A range of compact high quality mics that can be handheld or mounted with the supplied stand holder. Require CC-1 cable kit.

HM-4 or HM-5 £79.95 C
Fitted NC-4 or NC-5 insert

HM-PRO £79.95 C
Designed for FM radios.

HM-PRO+ £73.95 C
Studio quality - needs XLR lead.

CC-1 Cable adaptors for your radio £29.95 A

Tigertronics
SignaLink Interfaces

Tigertronics Signalink Sound Card Interfaces do not require the use of a com port to trigger PTT on the rig. SignaLink have internal links which make them compatible with most of the rigs on the market. Radio lead is supplied, state which when ordering. Extra mic leads are available.

SL-USB-4R 4-Pin Round £89.95 C
SL-USB-13PDI Icom 13-Pin Din £94.95 C
SL-USB-13PDK Kenwood 13-Pin £94.95 C
SL-USB-8R 8-Pin Round £89.95 C
SL-USB-RJ11 Modular RJ-11 £89.95 C
SL-USB-RJ45 Modular RJ-45 £89.95 C

Diamond
Switch Mode Power Supplies

New Lower Prices!

GSV-3000

**Output voltage: 1 - 15V DC*
**Output current 30A continuous*
**Built-in cooling fan*
**Supply 230V AC 50Hz *Weight 9kg*
**Size 250x150x240mm*

£199.95 D

GZV-2500 £139.95 D
Output 25A, 5-15V DC, supply 230V AC Switch mode over volts protected.

GZV-4000 £189.95 D
Output 40A, 5-15V DC, supply 230V AC Switch mode over volts protected.

GZV-6000 £369.95 D
Output 60A, 1-15V DC, supply 230V AC Switch mode over volts protected.

Rigblaster USA
Data Interfaces

A range of high performance interfaces.

RB/DU/CUSB £329.95 C
DUO Data Mode Soundcard Interface + USB
RB/PR/CUSBDC £279.95 C
PRO Data Mode Soundcard Interface + USB
RB/PL/C-USBDC £159.95 C
PLUS Data Mode Soundcard Interface + USB
RB/NO/CUSB £79.95 C
NOMIC Data Mode Soundcard Interface Passive USB
RB-CD Software Collection v8.1 £8.95 C

SSB Electronics
Mast Pre-Amps

SP-6 Brilliant German engineering. This 6m receiver pre-amp gives you the ultimate reception and over rides cable losses. **£239.95 C**

SSB-SP-2000 2m mast pre-amp £239.95 C
SSB-SP-7000 70cms mast pre-amp £249.95 C
SSB-SP-23 23cms mast pre-amp £339.95 C
SSB-SP-13B 13cms mast pre-amp £299.95 C
DCW-2004 Sequential controlker £99.95 C
DCW-2004SHF Seq. cont. 23/13cms £109.95 C
UEK-3000-2 13cm -2m downconverter £399.95 D

Nissei
X-Needle Meters

NEW

This new range of large cross-needle meters are amazing value!

RX-103 1.6-60MHz 20/200W/2kW £49.95 C
RX-203 1.8-200MHz 2/20/200W £49.95 C
RX-403 125-525MHz 2/20/200W £49.95 C
RX-503 1.8-525MHz 2/20/200W £69.95 C

Watson
Walk-About Antennas

Base loaded telescopic whips that plug into your FT-817 & give you total HF portability.

AT-10 10m single band whip £19.95 A
AT-12 12m single band whip £19.95 A
AT-15 15m single band whip £19.95 A
AT-17 17m single band whip £19.95 A
AT-20 20m single band whip £19.95 A
AT-30 30m single band whip £19.95 A
AT-40 40m single band whip £21.95 A
AT-80 80m single band whip £21.95 C

Hustler
HF & Mobile Antennas

Verticals

Hustler verticals are known around the world for their performance and sturdy construction.

6-BTV 6 band inc 30m £259.95 D
5-BTV 5 band 80-10m £219.95 D
4-BTV 4 band 40 - 10m £179.95 D

Mobiles

Base Whip Sections

MO-1 137cm Folds 1/3rd Up £38.95 C
MO-2 137cm Folds Halfway Up £38.95 C
MO-3 137cm Non Folding £29.95 C
MO-4 67cm Non Folding £26.95 C

Resonator Top Section

RM-10	10m	150-250kHz	£21.95 C
RM-11	11m	150-250kHz	£21.95 C
RM-12	12m	90-120kHz	£21.95 C
RM-15	15m	100-150kHz	£21.95 C
RM-17	17m	120-150kHz	£26.95 C
RM-20	20m	80-100kHz	£26.95 C
RM-30	30m	50-60kHz	£29.95 C
RM-35	40-30m	7-10MHz	£29.95 C
RM-40	40m	40-50kHz	£29.95 C
RM-50	60-40m	5-7MHz	£29.95 C
RM-60	60m	5MHz	£32.95 C
RM-80	80m	25-30kHz	£32.95 C

WATSON *SPECIAL OFFER!*

W-420 VSWR/PWR Meter

118-530MHz, 5/20/200W
Was £49.95
Now £34.95 C

Watson
VHF/UHF Antennas

VHF-UHF Verticals

W-30 2m/70cms 3/6dB length 1.15m 150W SO-239 £49.95 C
W-50 2m/70cms 4.5/7.2dB length 1.8m 150W SO-239 £54.95 C
W-300 2m/70cms 6.5/9dB length 3/1m 150W SO-239 £74.95 D
W-2000 6m/2m/70cms 2.15/6.2/8.4dB length 2.5m 150W £89.95 C

VHF-UHF Mobile Whips

W-2LE	2m 0dBv length 0.48m	£10.95 C
W-285	2m 3.4dBv L. 1.33m	£14.95 C
W-77LS	2m/70cm 0/2.4dBv L. 0.43m	£14.95 C
W-770HB	2m/70cm 3/5.5dBv L. 1.1m	£19.95 C
W-7900	2m/70cm 5/7.5dBv L. 1.58m	£31.95 C
W-627	6/2/70cm 2/4.5/7.2dBv L.1.6m	£34.95 C

GAP Antennas
HF Verticals for DX

Challenger-DX 8-band HF-VHF
• Bands: 80, 40, 20, 15, 12, 10, 6, 2m • 2kW PEP SSB • VSWR: Better than 2:1 • Height 9.6m (31.5ft) • Radials 3x 7.6m (25ft) • Can be mast mounted • Weight 8kg **£299.95 D**

Voyager-DX 4-Band LF
• Bands: 160, 80, 40, 20m • 2kW PEP SSB • VSWR: Better than 2:1 • Height 13.72m (45ft) • Radials 3x 17.4m (57ft) • 2ft ground pivot assembly inc • Weight 13.6kg **£399.95 D**

Eagle-DX 6-Band
• Bands: 40, 20, 17, 15, 12, 10m • 2kW PEP SSB • VSWR: Better than 2:1 • GAP centre fed • Height 6.4m (21ft) • 2m (80in) 3 x counterpoises • Weight: 4.9kg **£339.95 D**

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

ML&S are very proud to have been appointed UK & Ireland Distributor for the Wouxun Electronics range of Communication Handhelds

wouxun®

Professional Two-way Radio Manufacturer

www.wouxun.co.uk

Wouxun company's motto is 'Quality first, customer supreme'. To their customers this means they have the most advanced production facilities in the industry and do the most rigorous testing for product quality in order to meet the ISO9001 standard. Founded in 2000 and located in Quanzhou, China.

Wouxun KG-UVPD1P 2/70 Full Dual Band FM Handie

ML&S Price: £89.99

- ✓ 5W RF Output 2m & 4W 70cm
- ✓ Frequency Range: 144-146 & 430-440MHz (RX/TX) 136-174 & 420-470MHz Capable
- ✓ Work Mode: V/U or V/V or U/U can be set freely
- ✓ English Voice Guide
- ✓ SOS Function
- ✓ 1750Hz Tone
- ✓ DTMF Encoding Function
- ✓ CTCSS/DCS Scan (Digital/Analog)
- ✓ Bright Flashlight Illumination
- ✓ Band can be set freely on the same Channel VHF TX-UHF RX or UHF TX-VHF RX
- ✓ Built-in FM Radio (76-108MHz RX)
- ✓ Wide/Narrow Bandwidth Selection (25khz/12.5khz)
- ✓ Priority Scan, Add Scanning Channel
- ✓ High/Low Power Selection
- ✓ Channel Name Edit and Display
- ✓ 50 Groups CTSS/105Groups DCS
- ✓ Multi Step Frequency:(5K/6.25K/10K/25K/50K/100K)
- ✓ Multi Scan
- ✓ VOX Transmission
- ✓ Transmit Overtime Voice Prompt
- ✓ Begin/End Transmitting BEEP Prompt
- ✓ Auto/Manual Keypad Lock
- ✓ Wire Clone, Programmable By Computer
- ✓ Stopwatch Function
- ✓ Low Voltage VOICE prompt
- ✓ Busy Channel Lockout

Supplied accessories:
1.3Ah Li-Ion Battery Pack (5W)
Intelligent Base charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap
Handbook

Wouxun KG-699E/4M 4m FM Handie

ML&S Price: £89.99

- ✓ 5W RF output
- ✓ English voice guide to under 5W RF
- ✓ 70-70.500MHz 4m Amatuer Band (66-88MHz capable)
- ✓ Dual display and standby modes
- ✓ 128 Memory Channels
- ✓ 8 Groups Scrambler
- ✓ Channel Name Edit Available
- ✓ Output Power VHF 5W/1W UHF 4W/1W
- ✓ High/Low Power can be changeable by Top Key
- ✓ VOX (Level Adjustable)
- ✓ DTMF Encoding and DTMF Decoding
- ✓ 105 Groups D.C.S/50 Groups CTCSS
- ✓ DCS/CTCSS of RX and TX can be set respectively
- ✓ Reverse FrequencyFunction
- ✓ Busy Channel Lockout
- ✓ Distant Alarm
- ✓ ANI (Caller ID)
- ✓ Multi Scan Mode (TO/CO/SE)
- ✓ Inspection, Monitor, Stun, Kill and Emergency Alarm
- ✓ All Calls, Group Calls and Selective Calls
- ✓ Calling Ring and Ring Overtime Auto Answer
- ✓ Multi Silent Mode (QT/QTADT/QTXDT)
- ✓ Channel Steps (5K/6.25K/10K/12.5K/25K)
- ✓ Wide/Narrow bandwidth Selection (25KHz/12.5KHz)

Supplied accessories:
1.3Ah Li-Ion Battery Pack (5W)
Intelligent Base Charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap
Handbook

Wouxun KG-679E/2M 2m FM Handie

- ✓ 5W RF output
- ✓ English voice guide to under 5W RF
- ✓ 144-146MHz 2m Amateur Band (136-174MHz capable)
- ✓ 8 groups scrambler
- ✓ Channel name edit available
- ✓ Output power VHF 5W/1W UHF 4W/1W
- ✓ High/Low power can changeable by top key
- ✓ VOX (Level adjustable)
- ✓ DTMF encoding and DTMF decoding
- ✓ 105 groups D.C.S/50 groups CTCSS
- ✓ DCS/CTCSS of RX and TX can be set respectively
- ✓ Reverse frequency function
- ✓ Busy channel lockout
- ✓ Distant alarm
- ✓ NI (Caller ID)
- ✓ Multi scan mode (TO/CO/SE)
- ✓ Inspection, monitor, stun, kill and emergency alarm
- ✓ All calls, group calls and selective calls
- ✓ Calling ring and ring overtime auto answer
- ✓ Multi silent mode (QT/QTADT/QTXDT)
- ✓ Channel steps (5K/6.25K/10K/12.5K/25K)
- ✓ Wide/Narrow bandwidth selection (25KHz/12.5KHz)

Supplied accessories:
1.3Ah Li-Ion Battery pack (5W)
Intelligent Base Charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap
Handbook

ML&S Price: £58.99

WO/BLO-004
1700mAh Li-ion BatteryPack
£19.99

WO/BAO-001
'AA' Battery Pack
£9.99

WO/ELO-001
Eliminator
£9.99

WO/CCO-001
Car charger
£9.99

WO/SMO-001
Mic/Speaker
£14.99

WO/PSO-110
Programming Software and USB Programming Cable
£19.99

WO/CASE
Leather case
£9.99

WO/AAO-002
BNC Socket to SMA plug antenna adapter
£4.99

WO/AAO-001
SO-239 socket to SMA plug antenna adapter
£4.99

WO/CHO-004
110-234v AC & 13.8v DC spare charger (one is included as standard)
£22.95

WO/CHO-006
Six-way charger
£149.99

Don't forget Wouxun have a complete range of Handies available for Commercial, Marine and Ham. Call for details.

See www.wouxun.co.uk

E&EO

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
The World's Favourite Ham Store

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

Tel: **0845 2300 599**

(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)

Web: www.hamradio.co.uk E-mail: sales@hamradio.co.uk