RadCom

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

DECEMBER 2012
VOLUME 88
NUMBER 12
£4.75

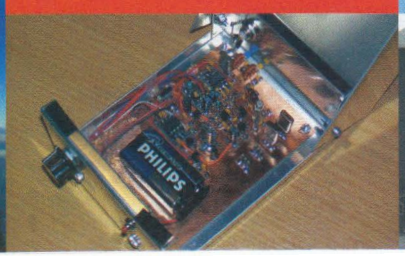
Season's Greetings

from the RSGB

Centenary
Calendar of events revealed for RSGB Centenary Year

GHz
Excellent mountain takeoff for Swiss microwave beacons

QRP
36,460 miles per watt in PP3 SOTA challenge



Review
Acom 1500 HF+6m 1500W linear amplifier

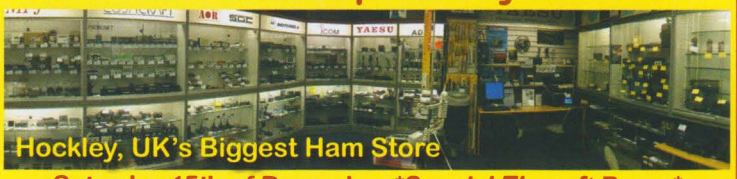
WATERS & STANTON

Merry Christmas To All Our Customers!

Orderline
01702 206835

Online Catalogue
www.wsplc.com

Christmas Open Day Sale!



Saturday 15th of December *Special Elecraft Demo*

Come and visit our shops in Hockley & Glenrothes, enjoy free food and some great deals. In our usual Christmas spirit, we will have some special offers and great prices for callers only. Treat yourself for Christmas and get a bargain!

Treat Yourself For Christmas

Pre order your Elecraft gear and we will build it ready for collection on our Open Day. All tested and calibrated. But don't leave it until the last minute!

InnoAntennas

Performance through Innovation

The 50MHz "Magic" Band

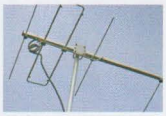
W7EW ordered 6 x 7 element 50MHz Yagis!

2-50-LFA2	6.7dB/Gn, 14.43dB F/B 0.7m boom	£89.95
3-50-OWL	7.67dB Gn, 18.4dB F/B, 1.6m boom	£99.95
3-50-LFA	8.9dB Gn, 20dB F/B, 2.3m boom	£119.95
4-50-LFA-S	9.2dB Gn, 23dB F/B, 2.6m boom	£154.95
5-DES-50	9.6dB Gn, 35dB F/B, 2.6 boom	£154.95
5-50-LFA-S	10.5dB Gn, 27dB F/B, 4.1m boom	£194.95
6-50-LFA-S	11.4dB Gn, 34dB F/B, 4.1m boom	£289.95
8-50-LFA-L	14.1dB Gn, 26dB F/B, 12.5m boom	£699.95

432MHz Long Yagis

10EL-432-LFA-SQ	14.4dB Gn, 27.8 F/B 2m bm	£92.95
14EL-432-LFA-SQ	15.7dB Gn, 39dB F/B, 2.9 bm	£119.95
16EL-432-LFA-SQ	15.9dB Gn, 40dB F/B, 3.5 bm	£139.95
18EL-432-LFA-LN	18.1dB Gn, 38dB F/B, 4.3m bm	£174.95
20EL-432-LFA-LN	18.6dB Gn, 39dB F/B, 4.9 bm	£195.95
26EL-432-LFA-LN	19.8dB Gn, 36dB F/B, 6.8 bm	£255.95

The 144MHz DXers Choice



All antennas rated to at least **3kW** RF Power.

Specials to Order.

3-LFA-144	8.7dB Gn, 0.7m boom	£59.95
4-LFA-144	9.5dB Gn, 29dB F/B, 1.17m boom	£74.95
5-LFA-144	11.1dB Gn, 20.3dB F/B 1.8m boom	£89.95
6-LFA-144	11.9dB Gn, 29.3dB F/B, 2.4m boom	£104.95
7-LFA-144	12.9dB Gn, 22dB F/B, 2.9m boom	£134.95
8-LFA-144	13.3dB Gn, 27dB F/B, 3.8m boom	£164.95
9-LFA-144	14dB Gn, 26dB F/B, 4.4m boom	£194.95
12-LFA-144	15.8dB Gn, 30dB F/B, 7.2m boom	£269.95
14-LFA-144	16.6dB Gn, 34dB F/B, 9m boom	£325.95
16-LFA-144	17.3dB Gn, 38dB F/B, 10.9m boom	£409.95
18-LFA-144	17.9dB Gn, 38dB F/B, 12.7m boom	£455.95
20-LFA-144	18.3dB Gn, 38dB F/B, 14.8m boom	£509.95

At Last - 4m Quality Yagis!

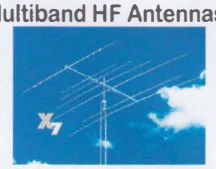
3-OWL-70	7.7dB Gn, 17dB F/B, 0.9m boom	£82.95
3-LFA-70	8.76dB Gn, 21.5dB F/B, 1.4m boom	£99.95
4-LFA-70	9.8dB Gn, 16.3.5dB F/B, 2.14m boom	£129.95
5-LFA-70	10.7dB Gn, 25dB F/B, 3.1m boom	£149.95
6-LFA-70	11.3dB Gn, 34dB F/B, 4.3m boom	£189.95
8-LFA-70	13.5dB Gn, 35dB F/B, 8.4m boom	£349.95

CUSHCRAFT

COMMUNICATIONS ANTENNAS

Cushcraft Antennas - Part of the MFJ Group

Multiband HF Antennas



X7 10, 15 & 20m 7 element yagi 2KW 5.48m long 12.5-13db gain £999.95 D

A3-S 10, 15, & 20m 3 element yagi 8db gain 2KW 4.27m long £629.95 D

A4-S 10, 15, & 20m 4 element yagi 8.9db gain 2KW 5.48m long £699.95 D

A3-WS 12 & 17m 3 element yagi 8db gain 2KW 4.27m long £499.95 D

MA5B 10/12/15/17/20m 3 element mini beam with balun £529.95 D

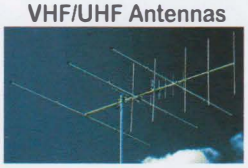
R-6000 6, 10, 12, 15, 17 & 20m vertical 5.8m long £459.95 D

R-8 40-6m vertical 1.5kW 8.7m £559.95 D

MA5VA 10,12,15,17,20m compact vertical 500W £309.95 D

MA6VA 6,10,12,15,17,20m compact vertical 500W £349.95 D

VHF/UHF Antennas



A270-6S 2m/70cms 3 element beam 7.8db gain 0.85m long £139.95 D

A270-10S 2m/70cms 5 element beam 10db gain 1.9m long £174.95 D

A6270-13S 6m/2m & 70cm 13 element yagi £289.95 D

AR-270 2m/70cms vertical 3.7/5.5db gain 1.13m high dualband Ringo £139.95 D

AR-2 2m vertical 3.75db gain 1.2m high the original Ringo £72.95 D

AR-X450B 70cm Ringo ranger II £109.95 D

A50-3S 6m 3 element beam 8db gain 1KW 1.8m long £149.95 D

A50-5S 6m 5 element beam 10.5db gain 3.7m long £209.95 D

A50-6S 6m 6 element beam 11.6db gain 6.1m long £419.95 D

HF High Performance Transceivers

YAESU FT-DX3000

HF & 6m Transceiver **NEW**

The new mid range transceiver borrows much from the FTDX-5000 series. You get dual roofing filters and superb DSP IFfiltering. The large colour LCD screen is a real treat and you can send and decode RTTY and PSK31. The spectrun scope is used for both band display and audio for data. A new front end handles high signal levels, and the down conversion to 9MHz brings back tradition and performance. There is a 9MHz IF output and the USB interface comes as standard. And of course you get a built-in automatic ATU. **PHONE FOR DEAL PRICE!**

YAESU FT-950 HF & 6m Transceiver

Step up to the FT-950 and you enter the world of advanced £1000+ class design. You get 30kHz - 56MHz Rx, Auto ATU, triple conversion Rx with 3 roofing filters, 32 bit floating point DSP, Superb dynamic range, Tx variable bandwidth and Mic EQ adjust, plus CW zero/spot feature, CW message storage etc. **IN STOCK £1264.95 D**

FT-2000 160 - 6m Transceiver

This radio is a DXers favourite and widely used for DXpeditions and contests. Covering 160m to 6m. It has all the digital features and auto ATU. Available as 100 Watt or 200 Watt version.

IN STOCK 100W £2259 D 200W £2899 D

FT-DX5000 160 - 6m Transceiver

The current Yaesu "flagship" radio, covering 160m to 6m delivering 200 Watts. **ALL IN STOCK**

FT-DX5000 Standard radio	£4635.95 D
FT-DX5000D + SM-5000 monitor	£4939.95 D
FT-DX5000MP + monitor & filters	£5369.95 D

KENWOOD TS-590S 160m - 6m

This radio has won the admiration of the radio press and hams all over the world. The best dynamic range in its class, digital IF, narrow roofing filters and auto ATU. Also FREE PC control program that can be downloaded. Exceptional value. **IN STOCK £1329.95 D**

ICOM IC-7410 HF-6m Transceiver

This lovely new HF-6m all-mode 100W transceiver offers superb front end dynamic range. and has a 15kHz roofing filter. It also features a 36kHz DSP razor sharp filter, internal auto ATU, PC control via a USB port and speech synthesizer. **IN STOCK £1695.95 D**

IC-7600 HF Transceiver

The IC-7600 HF/50MHz transceiver is enhanced with some of the main features tried tested on the flagship IC-7700/7800 models. It is highly regarded by Amateur operators world-wide. Features inc a double conversion superheterodyne system, dual DSP units & 3kHz IF (roofing) filter. **IN STOCK £3519.95 D**

IC-9100 HF Transceiver

The Icom IC-9100 is ideal for the operator who is looking for a complete high performance radio that covers HF - UHF in one box. It offers 100 Watts output on all bands up to 2m, whilst on 70cms you get a healthy 75 Watts. An internal auto ATU is included which covers HF plus 50MHz.

IN STOCK £2899.95 D

Tigertronics SignaLink USB Soundcard Interfaces

The SignaLink USB combines the excellent performance of the SL-1+ with a built-in low-noise USB sound card. It delivers optimum performance whilst eliminating the need to use your computer's sound card. The SignaLink USB will work with all radios (just select appropriate SignaLink model) and it can then be attached to the Mic. jack, Data port or Accessory port. **£99.95 C Each**

SL-USB-4R 4 pin round mic	**SL-USB-5PD** 5 pin din	for Kenwood
SL-USB-8R 8 pin round mic	**SL-USB-8PD** 8 pin din	**SL-USB-6PMD** 6 pin mini din
SL-USB-RJ-11 RJ-11 mic	**SL-USB-13PDI** 13 pin din Icom	**SL-USB-NC** unterminated
SL-USB-RJ-45 RJ-45 mic	**SL-USB-13PDK** 13 pin din	

PLUG & PLAY JUMPER MODULES FOR SL-USB

SLMOD6PM for SL-USB and 6 pin mini din data port	£9.95 A
SLMOD8PD for SL-USB and Icom radios with 8 pin din accessory socket	£9.95 A
SLMOD5PD for SL-USB and Yaesu/Ten-Tec 5 pin din accessory socket	£9.95 A
SLMOD13I for SL-USB and Icom radios with 13 pin din accessory socket	£9.95 A
SLMOD13K for SL-USB & Kenwood radios with 13 pin din accessory socket	£9.95 A

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11

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Phone: 0845 5050128
Fax: 01592 610451
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Tue-Fri 9.15am-5pm Closed Monday

Fast Same Day Despatch Service!
Orders Received Before 3pm

Buy Now Pay Later Available!

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Follow @wsplc on twitter!

Heil Audio Accessories

Pro-Set-3
SSB and CW Dream Quality!

The new ProSet 3 headphones are designed to give crisp, clear reproduction of voice and CW signals. Using Bob Heil's design needs, you will be knocked over by how much audio improvement you get. Quality audio at a sensible price. Also works with iPod etc! **£109.95 D**

Pro-Set-Elite-6

Modelled on the ProSet-6 but adds phase reversal switch which offers a spatial awareness that moves signals around in your head to give perceived placement of signals between the two acoustic headphone chambers.

Pro-Set-Elite-6 £179.95 C
Pro-Set-Elite-IC £189.95 C
AD-1 Rig adaptor leads from £19.95 C

New Icom IC-7100 - Just about to ARRIVE!

As Seen At National Hamfest 2012!

The most exciting news from Icom is the new IC-7100 transceiver that offers 100W from 1.8 -50MHz, 50W on 4m and 2m and 35W on 70cms. A big leap forward is the introduction of a colour touch screen and a convenient built-in speaker in the remote head unit.

- *HF, 6m, 2m, 70cm Multi-band, All-mode*
- *DSTAR DV Mode • Intuitive Touch Screen Display*
- *Easy-to-see, Easy-to-use Slant Top Controller*
- *Built-In SD Card Slot & USB • Built-In Speaker*

Register your interest today!

New Icom Remote Control System

Operate Your Icom Rig Via The Internet

As Seen At National Hamfest 2012!

The new **RC-28** remote control is Icom's new controller that works in conjunction with the RS-BA1 software to enable you to remotely control your Icom radios from anywhere in the world. The controller is a nicely weighted item that features VFO, PTT and two programmable buttons.

IN STOCK £279.95 D including software

New TS-990S - This Radio Expected December!

As Seen At National Hamfest 2012!

- *Freq. Range: 1.8 - 50MHz TX / RX*
- *Modes: SSB / CW / FSK / PSK / AM / FM*
- *TX Power: 5 - 200W (AM 50W)*
- *Built-In ATU • Built-In Switching PSU*
- *Display: 7 Inch Colour TFT*

There are no firm delivery dates yet, but it is due Winter 2012.

Register your interest today!

VHF UHF Mobiles

NEW

TM-281E 2m FM 65/25W Mobile **£169.95 D**
On or off the road, Kenwood's TM-281E is a mobile you can count on. This MIL-STD compliant transceiver delivers powerful performance, excellent audio clarity, and a host of advanced features.

FT-2900E 75 Watt 2m 3W Audio, CTCSS, DTMF mic & "WIRES" internet. **£142.95 D**

FT-7900E 2m/70cms mobile 50/40W CTCSS, DTMF, "WIRES" internet, wide Rx **£239.95 D**

FT-8800E Dualband Mobile 50W / 30W Great Value **£343.95 D**

FT-8900R Quad band 10/6/2m/70cm FM 50W (70cm 35W) **£389.95 D**

FTM-10E 2m/70cms Blue Tooth & built-in mic. **£324.95 D**

FTM-350E 2m/70cm Mobile Bluetooth GPS APRS **£579.95 D**

ID-E880 50 Watt Dual band 2m/70cm with D-Star and airband receive. **£439.95 D**

TM-D710E 50 Watts 2m/70cms with APRS **£445.95 D**

TM-V71E 2m/70cm Mobile with Echo Link **£299.95 D**

It Costs Less At W&S!

Turn This >>>> Into This!

Radio has never been cheaper in real terms but that does not help if you are short of cash. So why not turn out all that old gear and part exchange it for what you really want. EVEN DEAD equipment may have value! Just call us on 01702 203353 or e-mail us your list of gear together with what you want to buy, at: sales@wsplc.com. We will give you an immediate quotation. That new radio is waiting.

Handheld Transceivers

ID-31E **NEW**
70cms D-Star handheld with built-in GPS, IPX7 submersible & D-Star DV mode, SD card slot, 1252 memories & 5W output. **£349.95 D**

TH-K20E & TH-K40E **NEW**
Two new handies from Kenwood. "K20E" offers 5.5W output and rx from 136-174MHz. "K40" offers 5W out and rx from 400 - 470MHz. **£119.95 D each**

VX-3E 2m / 70cm Handheld Wideband receive **£169.95 D**

VX-6E 2m/70cms handy, 5W Wideband Receive **£214.95 C**

FT-60E 2m/70cms, 5W handy Wideband Receive **£129.95 C**

VX-8GE Dualband 2m/70cm 5W + GPS Antenna **£349.95 D**

VX-7R Waterproof triple band handy (silver/black) **£299.95 C**

VX-8DE Triple Band 6/2m/70cm Upgraded APRS **£369.95 D**

IC-E80D Dual band 2m/70cm D-Star CTCSS & DTCS GPS Compat. **£329.95 D**

IC-E92D Dual band 2m/70cm waterproof fitted D-Star. Rugged radio. **£387.95 D**

TH-F7E Dual band 2m/70cm + wideband receive inc. SSB **£236.95 D**

TH-D72E Dual band 2m/70cm with GPS & TNC + SiRF **£426.95 D**

TG-UV2 Dual band 2m/70cm with CTCSS DCS & LED torch! **£84.95 D**

KG-UV6D Dual band 2m/ 70cm 5W/4W SMA **£94.95 D**

HF - UHF in One Box!

FT-897D base or portable, this 1.8 - 440MHz transceiver is great value. 1.8 - 50MHz 100W 2m 50W 70cm 20W. **IN STOCK £819.95 D**

FT-857D The great value mobile or base 1.8 - 440MHz. HF-6m 100W, 2m 50W 70cm 20W. **IN STOCK £714.95 D**

The **TS-2000E** is a firm favourite for those wanting ultimate all-mode performamnce on all bands. 1.8-144MHz 100W 70cm 50W. It has the highest power on 2m & 70cms and the TS-2000X version adds 23 cms! Includes auto ATU, DX cluster facility & digital IF for superb weak signal performance. **IN STOCK £1549.95 D**

IC-7000

The most compact, high spec. HF-UHF transceiver available. With its lovely display and digital IF filters, it can handle all your needs - SSB CW and data. HF-6m 100W, 2m 50W and 70cms 35W. All in one lovely box. **IN STOCK £1189.95 D**

HF on a BUDGET!

FT-450D transceiver comes with the extra IF filter & an Auto ATU built in. 100W 160m - 6m with 3 IF filters 300Hz, 500Hz & 2.4kHz. **IN STOCK £839.95 D**

IC-718 SSB CW up to 100W from 160m-10m. You won't find a more cost effective HF radio! **IN STOCK £594.95 D**

IC-7200 this 100 Watt radio covers 160m-6m and includes digital IF filters. IN STOCK **£839.95 D**

TS-480SAT A very HF transceiver giving 100 Watts from 160 - 6m and includes auto ATU. **IN STOCK £779.95 D**

Jupiter-538CE 160m - 10m 100 Watts SSB CW AM FM with on-screen CW reader and socket for PC keyboard. **IN STOCK £1649.95 D**

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11

WATERS & STANTON

Orderline
01702 206835
Online Catalogue
www.wsplc.com

AOR

AR-8200-MKIII

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

£499.95 D

AR-MINI

This amazing little radio covers 100kHz - 1.3GHz AM FM & WFM. 1000 memories, over 30 programmable features including CTCSS and DCS. Alphanumeric memories give meaningful channels and there is a builtin bar antenna covering 100kHz - 5MHz. Inc. NiMH pack and charger. FREE software database for PC loading via www.aorja.com.

£169.95 D

W&S are now approved suppliers to UK Government Departments

AR-ONE

This is a commercial grade comms receiver for monitoring. It has a detachable front panel for remote operation.

- *10kHz - 3.3GHz.*
- *10 VFOs*
- *High Intercept point*
- *Dual IF Outs.*
- *Two RS-232 ports*
- *Control head port*

£4899.95 D

AR-5001D

Widely regarded as one of the best for spectrum monitoring & follows in the foot steps of the AR-5000

** 40kHz - 3.15GHz*
** All Mode Reception*
** Digital Signal Processing*
** Monitor 3 Channels At Once!*
** SD Media Recorder*
** AF 12kHz IQ Output*
** Optional I/Q Board & Software*

£3749.95 D

AR-8600MKII Base/Portable

This base or portable station receiver covers 530kHz - 3GHz. All modes AM FM FMW & SSB with standard rotary tuning.

£699.95 D

AR-STV

This dual-band receiver scans & displays 1.2GHz & 2.4GHz wireless SSTV pictures. Fitted with 2.5" screen, it can store & time stamp pictures to download later via USB. Handles all common modes PAL NTSC etc. and can free scan between 900 - 2800MHz. NiMH cells and charger inc.

£869.95 D

WATSON

Watson antennas are made to exacting standards at their far east factory in Taiwan. They use stainless steel for elements & fittings, base VHF/UHF antennas are encapsulated in high quality fibre glass resin. All are totally weather proof.

Mobile Whips

High quality whips all with PL-259 base connectors.

W-285
2m 5/8th wave with foldover base **£19.95 A**
W-627
6m/2m/70cms whip with fold base **£39.95 C**
W-77LS
2m/70cms short whip just 39cms **£14.95 C**
W-7900
2m/70cms 5/7.6dB gain **£34.95 C**
W-8900
10/6/2 & 70cms mobile 1.32m **£69.95 C**
MULTI-RANGER-200 HF mobile whip
9-band HF mobile whip covering 80m - 6m and rated up to 200 Watts. **£59.95 C**
MULTI-RANGER-9 HF mobile whip
covers 80/40/20/15/10/6 and 2m. A great value whip antenna. **£39.95 C**

The Multiranger series offers a low cost way to mobile work. Fitted PL-259 bases.

Base Antennas

W-30 2m/70cm, Gain 3/6dB, Power 150W, Length 1.15m, Weight 0.885kg, SO-239. Features fibre glass case with stainless steel radials. **£49.95 D**

W-50 2m/70cm, Gain 5/7.2dB, Power 200W, Length 1.8m, Weight 1.2 kg, SO-239. Features fibre glass case with stainless steel radials. **£59.95 D**

W-2000 6m/2m/70cm, Gain 2/6.2/8.4dB, Power 100W, Length 2.5m, Weight 1.2 kg, SO-239. Features fibre glass case with stainless steel radials. **£99.95 D**

W-3HM Universal hatch mount **£14.95 A**
W-3CK Cable kit 5m long **£19.95 A**

W-300S

W-3HM

W-3CK

Mounting an HF mobile whip has never been easier! This 3-way magnetic mount will hold any HF mobile whip rock steady. **W-300S** has SO-239 socket and **W-300T** has 3/8th thread. **£39.95 C**

FlexRadio Systems®
Software Defined Radios

We Are Now Taking Orders For New Flex-6000 Signature Series

Flex-3000 160-6m 100 Watts Auto ATU

94dB dynamic range. 96kHz wide receiver display. Firewire connection. Built-in auto ATU, 100 Watts and weighs just 3.2kg. The FLEX-3000 is the high performancemid-range 100 watt all-band, all-mode amateur radio transceiver that achieves receiver performance that rivals all other traditional analogor hybrid DSP transceivers in its price class. The FLEX-3000 is the perfect transceiver for hams just getting started with high performancefully software defined radios or a companion SDR for existing FLEX-5000 owners who want a more convenient solution for portable operation . **£1399.95 D**

Flex-1500 160-6m 5 Watts All Mode

86dB dynamic range, 48kHz receiver display, USB cable, 5 Watts output. Low Cost Transceiver with Software Defined Radio Features and Performance This is a common theme for FlexRadio Systems' software defined radios - a focus on performance and exceptional value. And the FLEX-1500 continues that tradition for a transceiver in the sub £600 price class. A QRP radio that works perfectly with your laptop and a great driver for VHF/UHF transverting. **£579.95 D**

Flex-5000A 160-6m 100 Watts

In addition to exceptional performance, the FLEX-5000A offers the flexibility of multiple antenna ports, keying circuitry, balanced and unbalanced audio, plus a full-featured transverter interface. Options include an automatic antenna tuner and 2nd fully synchronous receiver. The FLEX-5000A is the perfect transceiver to Tune in Excitement!™ FlexRadio Systems, founded in 2003, is a leader in Software Defined Radio (SDR) technology. Our high-performance, GPL open source PowerSDRTM software is the gold standard in Software Defined Radio software. **SPECIAL PRICE** Whilst Stocks Last
5000A £2179 D + ATU £2449 D

SSB Electronics - Low Noise Preamplifiers

SSB-SP-6

** Freq: 50-52MHz*
** Gain: 20dB*
** Noise: 0.9dB*
** 500W by-pass*
** Insertion Loss: 0.1dB*
** HF-VOX 100W*
** N-Type Connectors*
** Supply: 13.8V DC*

£269.95 C

SSB-SP-23

** Freq: 1250-1296MHz*
** Gain: 20dB*
** Noise: 0.8dB*
** 100W by-pass*
** Insertion Loss: 0.2dB*
** RF-VOX 10W*
** N-Type Connectors*
** Supply: 13.8V DC*

£379.95 C

SSB-SP-2000

** Freq: 144-146MHz*
** Gain: 20dB*
** Noise: 0.8dB*
** 750W by-pass*
** Insertion Loss: 0.2dB*
** HF-VOX 100W*
** N-Type Connectors*
** Supply: 13.8V DC*

£259.95 C

SSB-SP-13B

** Freq: 2300-2400MHz*
** Gain: 24dB*
** Noise: 0.9dB*
** Insertion Loss: 0.4dB*
** RF-VOX 10W*
** N-Type Connectors*
** Supply: 13.8V DC*
** Waterproof Housing*

£339.95 C

SSB-SP-7000

** Freq: 430-440MHz*
** Gain: 20dB*
** Noise: 0.9dB*
** 500W by-pass*
** Insertion Loss: 0.4dB*
** HF-VOX 100W*
** N-Type Connectors*
** Supply: 13.8V DC*

£259.95 C

DCW-2004B

Sequence controller for SSB-SP-6/2000/7000 allows you to pass 13.8V DC up the coax feed line to the preamp, no need for a seperate DC feed!

£119.95 C

DCW-2004B-SHF As above but 13cm & 23cm for SSB-SP-23/13 **£129.95 C**

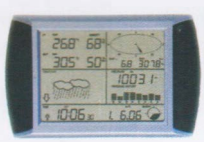
Watson Weather Stations

W-8681-SOLAR

This is weather station requires no connecting cable between the LCD monitor and the remote weather sensors. There is a large LCD control panel, solar transmitter, wind speed & direction sensors, temperature sensor, rain gauge and stub mast. All you need are 3x AA batts for the *new* LCD panel, the outside transmitters are solar powered! There is even a USB lead & software to connect to your PC!

£99.95 C

W-8681-MKII



Wireless weather station with LCD monitor and remote weather sensors. It offers amazing value and comes with everything you need to set it up in the garden. All hardware is included and the only items you need to supply are 3x AA cells for the LCD panel and 2x AA cells for the outside transmitter.

£79.95 C

W-8683 Wireless Weather Station - Ext Sensor/Temp/Humidity/Clock/Alarm **£26.95 A**
W-8684 LCD Display Clock + Remote Wireless Temp Sensor **£12.95 A**
W-8685 Bedside LCD Alarm Clock + Wireless Temp Sensor **£8.95 A**

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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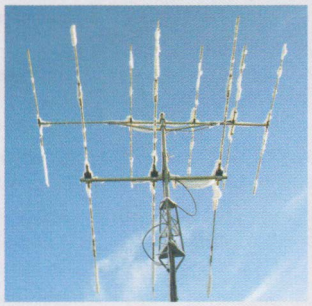
Notices to readers concerning errors and omissions and advertisments can be found at www.rsgb.org/radcom/notices

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 **January 2013 edition of *RadCom* is expected to arrive with most members by 17 December 2012, although this can take up to a week longer in some cases; international deliveries can take longer still.**

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

The online *RadCom* is at www.rsgb.org/radcom



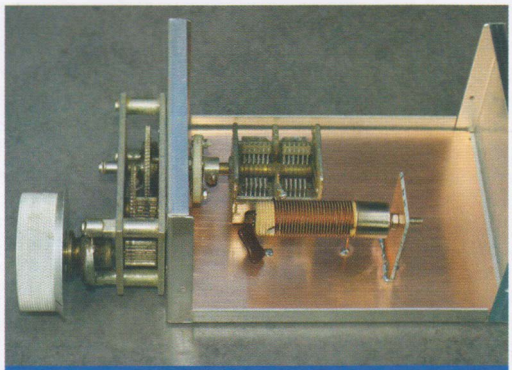
"This is how the antennas looked this morning!"

Photo: Robert Henderson, GM0UET

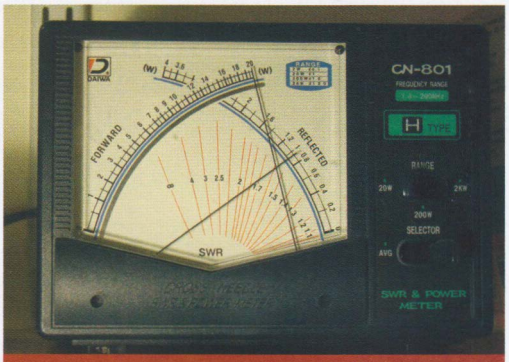
News and Reports

Reviews

Features



Stable VFO for direct conversion Rx – p19



SWR and transmission lines – p54

Members' Special Offer

Technical Features

Regulars

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926. RSGB is a trading name of Radio Society of Great Britain, a limited company registered in England and Wales with company number 00216431. 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.

RSGB MEMBERSHIP

Annual rates from 1 January 2011

Full membership (by Direct Debit). £47.00
(individual & club)
Family membership (by Direct Debit). £56.00

Paying other than by Direct Debit attracts a £4 premium.

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 or see www.rsgb.org/join.

YOUR RSGB

This page provides names and contact details for Board Members, Regional Managers, Committee Chairmen and Honorary Officers. Members seeking advice and guidance on any aspect of Amateur Radio of the Society's work are free to contact the relevant person below. But before doing so, please do check the comprehensive FAQs on the RSGB website, www.rsgb.org/faq/ to see if your question can be answered there.

For HQ staff below, both e-mail addresses and telephone details are provided, including the option to select when dialling through the RSGB switchboard (01234 832 700).

Chairmen and Honorary Officers:
These are all volunteers and give their time freely to support the Society. Members should respect the fact that many also have full time day jobs, and so e-mail is the appropriate method of communication.

General Manager:
Graham Coomber, GONBI,
e-mail: graham.coomber@rsgb.org.uk

Honorary Treasurer (Acting):
Richard Horton, G4AOJ, e-mail: g4aoj@rsgb.org.uk

Company Secretary:
Rupert R Thorogood, G3KKT, e-mail: g3kkt@rsgb.org.uk

THE RSGB INTERIM BOARD

The Interim Board was appointed by members at the EGM held November 2011 to serve as the Board of the Society until the 2013 AGM.

Dave Wilson, MOOBW (President),
e-mail: m0obw@rsgb.org.uk
Dr Bob Whelan, G3PJT (Board Chairman),
e-mail: g3pjt@rsgb.org.uk
Don Beattie, G3BJ, e-mail: g3bj@rsgb.org.uk
Phillip Brooks, G4NZQ, e-mail: g4nzq @rsgb.org.uk
Dr Chris Duckling, G3SVL, e-mail: g3svl@rsgb.org.uk
Dr John Gould, G3WKL, e-mail: g3wkl@rsgb.org.uk
Alan Messenger, G0TLK, e-mail: g0tlk@rsgb.org.uk

Note: The General Manager, Company Secretary and Acting Honorary Treasurer are not Directors, but are in attendance at Board Meetings.

REGIONAL MANAGERS

Region 1 – L Paget, GMOONX, e-mail: rm1@rsgb.org.uk
Region 2 – D Morrison, GM1BAN, e-mail: rm2@rsgb.org.uk
Region 3 – K A Wilson, M1CNY, e-mail: rm3@rsgb.org.uk
Region 4 – H Scrivens, GOUGE, e-mail: rm4@rsgb.org.uk
Region 5 – V Ravenscroft, MOVRR, e-mail: rm5@rsgb.org.uk
Region 6 – M Harper, MW1MDH, e-mail: rm6@rsgb.org.uk
Region 7 – J Sneddon, MWOEQL, e-mail: rm7@rsgb.org.uk
Region 8 – P Lowrie, MI5JYK, e-mail: rm8@rsgb.org.uk
Region 9 – A Johnston, G8ROG, e-mail: rm9@rsgb.org.uk
Region 10 – G Keegan, G6DGK, e-mail: rm10@rsgb.org.uk
Region 11 – P Helliwell, G7SME, e-mail: rm11@rsgb.org.uk
Region 12 – M Sanderson, MOIEO, e-mail: rm12@rsgb.org.uk
Region 13 – J Stevenson, GOEJQ, e-mail: rm13@rsgb.org.uk

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Abuse and poor operating
Amateur Radio Observation Service (AROS), Keith Bassett, G7NBU, AROS coordinator, e-mail: aros@rsgb.org.uk, www.rsgb.org/committees/honoraryofficers/aros.php

Amateur Radio Direction Finding
Bob Titterington, G3ORY, Chairman, ARDF Committee, e-mail: ardf.chairman@rsgb.org.uk, www.rsgb.org/ardf/

Contests
Ed Taylor, GW3SQX, Chairman, Contests Committee, e-mail: cc.chair@rsgb.org.uk, www.rsgb.org/radiosport/

EMC
John Rogers, MOJAV, Chairman, EMC Committee, e-mail: emc.chairman@rsgb.org.uk, www.rsgb.org/emc/

General Technical Matters
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Intruders to the Amateur Bands
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Repeater and Data Communications
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RSGB Awards
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Training & Education
Steve Hartley, GOFUW, Chairman, Training & Education Committee, e-mail: tec.chair@rsgb.org.uk, www.rsgb.org/clubsandtraining/

VHF matters
E-mail: vhf.manager@rsgb.org.uk

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

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Telephone: 01234 832 700, Option 5

Amateur Radio Examinations
E-mail: exams@rsgb.org.uk
Telephone: 01234 832 700, Option 4

***RadCom* (news items, feature submissions, etc)**
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Telephone: 01234 832 700, Option 3

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Telephone: 01234 832 700, Option 1

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IOTA
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Telephone: 01234 832 702

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PO Box 5, Halifax HX1 9JR, England
Telephone: 01422 359 362
E-mail: qsl@rsgb.org.uk, www.rsgb.org/qsl

PLAY YOUR PART IN YOUR RSGB

Have Your Say
Let us know how we're doing! Through "Have Your Say" you can let us know your views and you will receive a reply from the General Manager or a Board Member.
Write to haveyoursay@rsgb.org.uk or go to www.rsgb.org/haveyoursay

Consultations
From time to time you will find we are consulting the membership on aspects of Society policy. You can find current consultations at: www.rsgb.org/consultations/

National Radio Centre
Don't forget to tell your friends about the National Radio Centre at Bletchley Park. Full details can be found at www.nationalradiocentre.com

Licensing & Special Event Stations
Licensing and Notices of Variation (NoVs) for special event stations are handled by Ofcom, 0207 981 3131, www.ofcom.org.uk

FAQs
The RSGB has compiled the questions most frequently asked by Members at www.rsgb.org/faq/

Band plan
The latest version of the band plan is always available on the website at www.rsgb.org/committees/spectrumforum/band-plans.php

Good Operating Practice
The RSGB fully supports the code of conduct and encourages all amateurs to read the advice. www.rsgb.org/tutors/pdf/good_operating_practices.pdf & www.rsgb.org/operating/ethics/docs/ethics_and_operating.pdf

RSGB Tech
The purpose of this service is to be the first port of call for technical queries on amateur radio matters. It is open to all radio amateurs. http://groups.yahoo.com/group/rsgbtech/

RSGB Shop
All RSGB goods - books, filters, clothing - can be purchased online at www.rsgbshop.org/

Club finder
Use the website to find your nearest radio club and check out the facilities they have to offer.
www.rsgb.org/clubsandtraining/

WEBSITE

Main 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, without the leading zeros (see your RadCom address label) as the password.
If you need to update your membership details, please visit www.rsgb.org/amend.

National Club of the Year 2012 Sponsored by Waters and Stanton plc

The Club of the Year competition is underway and there is still time to enter the Regional competition. The Regional winners will be entered in the National competition. This year's National competition is again sponsored by Waters and Stanton plc and the Society is very grateful to Peter Waters and Jeff Stanton for taking on the role of principal sponsors.

For full details of the competition contact your Regional Manager – see page 6 for details. The top prize for the top club is a handsome trophy and a cheque for £1000. The second and third placed clubs will receive cheques for £500 and £250 respectively. The competition winners will be announced at the RSGB AGM in 2013. The prize money comes with no strings attached and clubs may use the money in any way that they choose.

If you haven't yet decided to join the regional competition it is not too late – the closing date for entries is 31 January 2013. This is a golden opportunity to get your club on the map and your club too could hold the prestigious title of National Club of the Year.

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.

Mr R Skeggs, 2E0BHV
Mr B Cox, 2E0CKR
Mr C Astbury, 2E0COU
Mr T Newman, 2E0FDJ
Mr J M Smith, 2E0JNT
Mr N Yorke, 2E0NEI
Mr N Lake, 2E0NLK
Mr S Chandler, 2E0SCQ
Mr J Burnett, 2E0VAK
Mr A McCrystal, 2E0ZOR
Mr B Campbell, 2I0CSB
Mr J Rayne, 2M0CNZ
Mr H Weissler, AJ4CJ
Mr J Breen, G0DTX
Mr R Southerington, G0IOZ
Mr A M Perry, G0RNE
Mr R McAleer, G0VLF
Mrs J Breen, G1OFX
Mr G McAllister, G1CKL
Mr J Ashby, G1DPB
Mr G Devenish, G3TIC
Mr A P Plummer, G3YMZ
Mr D Brighton, G4ISK
Mr D Wood, G6TAT
Mr D De Silva, G7AGI
Mr M Bexon, G7FQG
Mr G Mason, G7VIL
Mr B Heaney, G8IIS
Mr S Burrage, G8ILF
Mr N P Martin, GU4XGU
Mr G Dallaway, GW8MHT
Mr R Ramirez, K0WFS
Mr C J John, K3OXL
Mr W Poole, K4WFP
Mr S L Cromwell, K6VRS
Mr B Thomas, K6VWL
Mr J Diggs, KA3OHF
Mr D Roberts, KA4ETR
Mr J McCown, KD5EXR
Mr S Mills, M0DUH
Mr D Suplatowicz, M0GTV
Mr J K Lovell, M0JKL
Mr P Stubbs, M0PVX
Mrs G A Roddis, M0YLG
Mr E J Pritchard, M0ZTP
Mr A J Frater, M3LFD
Mr R Baldwin, M3RQQ
Mr P Lewickyj, M6CAJ
Mr A L Cranston, M6CBQ
Mr F T Roberts, M6CCI
Mr D Forsyth, M6DHF
Mr D Brown, M6DTJ
Mrs S E Lake, M6EXY
Mr J R Conduit, M6FLT
Mr A Foster, M6FOZ
Mr G F Webster, M6GAO
Mr R Wilcox, M6ICC
Mr M Draper, M6IKD
Mr I Bunting, M6IWB
Mr J Crewe, M6JCE
Mr J I Mason, M6JMN
Mr C Harris, M6LEY
Miss M J F Lake, M6MLK
Miss A Cockburn, M6MNC
Mrs J C Smith, M6ORS
Mr P Penycate, M6PAP
Mr P Smith, M6PBJ
Mr P Kirkden, M6PKU
Mr P R Evans, M6PRE
Mr D Scott, M6SDJ
Miss S E V Lake, M6SLK
Mr T Barratt, M6THB
Mr J Rufes, M6USD
Mr S Devos, M6VOS
Mr P Houghton, M6WKL
Mr S Hoyle, M6YYK
Ms R Ashton-cox, M6YYL
Mr A McDonough, M6ZAM
Mr M P Matthews, MD6IMX
Mr P Jones, MW0PJJ
Mr M Ryall, MW6BVU
Mr N Williams, MW6BYX
Mrs A Jones, MW6GNA
Mr G Jones, MW6LLT
Mr P Kane, N6PAT
Mr A Furu, OH1KVD
Rockall Group, OH4HIL
Mr F Aarup, OZ9FR
Mr A Huiskamp, PA9AHX
Mr W P Curry, RS208987
Mr M Osguthorpe, RS209994
Mr J P Wishart, RS211554
Mr G Hope, RS211563
Mr J Henderson, RS211596
Mr J Dent, RS211607
Mr R Pickwoad, RS211634
Mr S Lilleker, RS211641
Mr I Horabin, RS211642
Mr S Rigby, RS211653
Mr G P Gibson, RS211669
Miss E Jones, RS211686
Mr D Plummer, RS211687
Mr A C Underwood MICW, RS211702
Mr I King, RS211715
Mr D J Thomas, RS211744
Mr A J Comerford, RS211755
Mr D Freebody, RS211767
Mr C Dennis, RS211773
Miss L R Lake, RS211783
Mr P Millership, RS211792
Mr P Parkin, RS211799
Mr J Stevens, RS211801
Mr S W Wicombe, RS211808
Mr R C Lynch, RS211809
Mr A King, RS211841
Mr W Minikiewicz, W4FSV
Mr K Chen, W7AY

The RSGB would like to welcome back the following members who have rejoined the Society.

Mr G Warriner, 2E0BKW
Miss T E Edwards, 2E0CEY
Mr D J Glover, 2E0HNF
Mr A R Nesbitt, G0CWQ
Mr A J Doyle, G0FAU
Mr P J Copeland, G0FJS
Mr A J Horton, G0GWP
Mr A J Brittain, G0HXT
Mr RTJ Mansell, G0OVK
Mr P H Tyson, G0RLJ
Mr J R Thornley, G1NUS
Mr L K Shergold, G3APS
Mr T J Hayward, G3HHD
Mr B G Elcocks, G3RJX
Mr M A Tindal, G3VLQ
Mr M Stokes, G3ZXZ
Mr R S Reisch, G4GCX
Mr C Britton, G4IQO
Mr M J Ford, G4KBP
Mr J B Allan, G4LTH
Mr J R Higson, G4NTY
Mr B S Parr, G4TML
Mr A J Forbes, G4UST
Mr S Schofield, G4VMF
Mr A L Leach, G4WOQ
Mr M H Day, G4ZKI
Mr P F Minshull, G6DQM
Mr S Morgan, G6LUZ
Mr D J Hepworth, G7ABT
Mr P Jensen, G7BTP
Mr FE Chilton, G7IZW
Mr R D Ramsey, G7ONL
Mr J Bigwood, G8KNN
Mr V Benney, G8MUQ
Mr R J Bambrook, G8NRR
Mr H E Chapman, G8VEN
Mr J Baxter, G8VIQ
Mr K R Grattan, GD4RGR
Mr A Duffy, GI6ZIR
Mr S Webster, GM1WMU
Mr R E Lord, GW3NCT
Mr J V Veras, K9OCO
Mr D J Tysoe, M0CAJ
Mr H Mohd Ali, M0DHL
Mr R Tattersall, M0MLJ
Mr N W Pagdin, M0PDX
Mr P G Lockwood, M3PGL
Mr A Harvey, M3ZNJ
Mr P Shaw, M6DKL
Ms R Wadey, MI0RYL
Mr N P Robinson, MI3NPR
Mr J S Rauta, OH2BUW
Dr G P Welch, RS175965
Mr D Foley, RS186580
Mr C Murphy, RS207910
Mr I T Armitage, RS95481
Mr DAR Consitt, SM7JKD
Mr T A Kazancioglu, TA1HZ

Queen's Diamond Jubilee and Olympics QSO Parties

Members will be interested to know that Certificates have been dispatched for both of the QSO Parties that were formed around the use of the special prefixes this summer.

32 certificates were issued for the Queen's Diamond Jubilee Award and 24 for the Olympic Award. These turned out to be quite challenging awards as, whilst QSOs were not that difficult as there were plenty of stations who wanted a QSO with one's special prefix, it was more challenging to find other Q or 0 stations to make up the required 100 contacts. We hope that all those who took part enjoyed the event, even if they didn't make the requisite total to claim their certificate. Congratulations to the certificate recipients!

The RSGB would like to thank Ian Pawson, GOFCT and Pete Lindsay, G4CLA of the Contest Committee for facilitating the adjudication and to Kevin Williams, who designed the certificate.

Previous General Manager Update

It has been a while since we have reported on the matter of recovering the debt owed to the Society by the previous General Manager. While some of the money has been recovered there remains a significant amount outstanding and the Society continues to pursue through legal channels the recovery of that amount. The debt has been secured through a legal charge, and the Society is now working with its lawyers to give effect to that charge and recover the funds. As soon as this process is complete we will, of course, inform members. In the meantime we hope members will understand the need for caution in what is said.

CONGRATULATIONS

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

60 years

Mr P W Haylett	G3IPV
Mr D A S Holmes	GW3JSV
Mr H Taylor	G3LWK
Mr A J Turner	GOFMU

50 years

Mr B W N Harris	G3GTF
Mr G R Henderson	GM3RTJ
Mr E D Hodgson	G3RAR
Mr D J Jarvis	G4CEU
Dr C G Potter	MODDT
Mr K J Randall	G3RFH
Mr R Singleton	RS25288
Mr P G Torry	G3SMT

EME 2012

In the November *RadCom* the article on the EME 2012 conference omitted to mention the principal sponsor, Waters & Stanton plc. Our apologies to both the organisers of the conference and the sponsors.

Attention G6 call-sign holders

The QSL bureau wishes to apologise to Tony, G6GLP for any inconvenience caused by wrongly attributing his name and callsign to the G6 sub series, in the November issue of *RadCom*. The new collection sub-manager for the G6 Series of callsigns is Steve Wellon, G6DMG and his details can be found on the RSGB website by following the links to QSL managers, via the Operating section. If any Member is concerned that they may have recently sent collection envelopes to the wrong address, please telephone or e-mail the bureau.

Region 1 DRM

Jim Kelly, GM0SYV, Deputy Regional Manager for District 12 (Lanarkshire & Renfrewshire) has indicated he wishes to stand down as Deputy Regional Manager. The Society wishes to record its thanks for Jim's many years of service to the post.

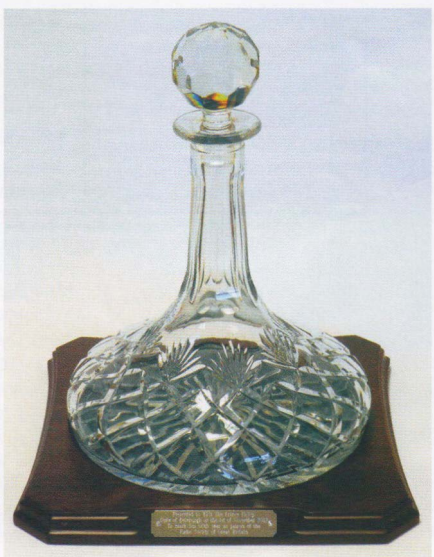
Deputy Regional Managers represent members within their area and are a key interface between the Society, local members and clubs.

If you think you can meet the challenge of this key post, please contact Len Paget, GM0ONX, on 01563 534 383 or by e-mail to rm1@rsgb.org.uk for further details.

Candidates for the post must be a Corporate Member of at least 2 years standing and a resident within the area he/she wishes to represent.

Royal Patronage

To mark the 60th anniversary of Patronage by His Royal Highness, The Duke of Edinburgh, the RSGB sent a gift to Buckingham Palace. RSGB President, Dave Wilson, M0OBW received a letter thanking the Society for "the splendid ship's decanter". It went on to say "His Royal Highness was delighted to receive this most generous present from the Radio Society of Great Britain to mark his 60th year as Patron. Prince Philip sends you and the Members of the RSGB his best wishes as you head into your centenary year."



QSL Matters

GW, MW and 2W manager Lloyd would like to apologise for any delays in responding to e-mails and temporary card delays. His house is undergoing major renovation and extension work, causing periodic disruption to main services. Completion is due at the start of December and he hopes to be back on track before year end.

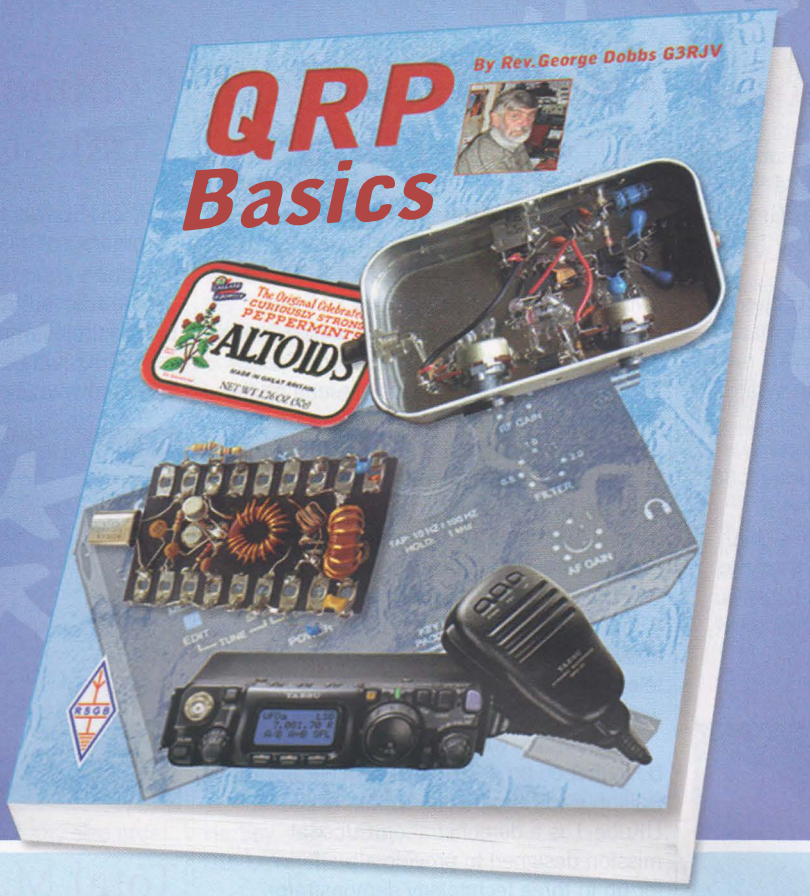
Throughout November the last quarterly card despatch of 2012 takes place to all UK sub managers, who aim to sort and send all possible cards during the 30 days following. This means that now is the time to make sure your sub manager has C5 collection envelopes to hand. Please make sure your envelopes show your callsign and membership number as this really speeds up the sorting process. Best wishes from the QSL bureau during this festive season.

Region 13 Election

Following the retirement of Jim Stevenson, GOEJQ, elections will take place in Region 13 for a new Regional Manager. The Society would like to thank Jim for his unstinting service to the Society both within Region 13 and nationally for many years.

There are two candidates standing for this position: Stephen Bowden, G4XCK and Steve Burke, M5ZZZ. In this instance, only Corporate Members in Region 13 are eligible to vote, including Family Corporate Members. Members will receive, by post, a ballot paper and details of the two candidates. Voting is by post only. The deadline for the casting of votes is noon on Friday 14 December and the result will appear on the RSGB website shortly after the count and in the February RadCom.

RSGB shop



P&P FROM FREE
see page 78 for full details

NEW

E&OE All prices shown plus p&p

QRP Basics

By George Dobbs, G3RJV

This new second edition of *QRP Basics* has been thoroughly updated and continues to provide the ideal guide to low power amateur radio. If you want a new challenge, or have just wanted to try QRP, or even simply want to improve your QRP station, then *QRP Basics* will help you do all of these things and much more.

QRP Basics starts with the 'Why' - what makes so many so enthusiastic about QRP - and then concentrates on the 'How'. Good, solid advice includes choosing commercial QRP equipment - both ready-made and kits, simple antennas and operating tips. Much of the book deals with the art of home-construction, providing practical advice on workshop techniques, and choosing and using components. Chapters are dedicated to simple construction projects based on tried and tested designs. These cover test equipment, transmitters, station accessories, and transmitting and receiving equipment for beginners. Appendices explain where to buy components and how to find more information.

If you are already a QRP operator, *QRP Basics* is certain to improve your experience, or are new to this part of amateur radio, *QRP Basics* is everything you need to get started. Whichever category you fall into, this book will ensure you have fun.

Size 174x240mm 208 pages ISBN: 9781-9050-8684-9

Non Members £14.99
RSGB Members £12.74

ANOTHER BOOK YOU MIGHT ALSO LIKE

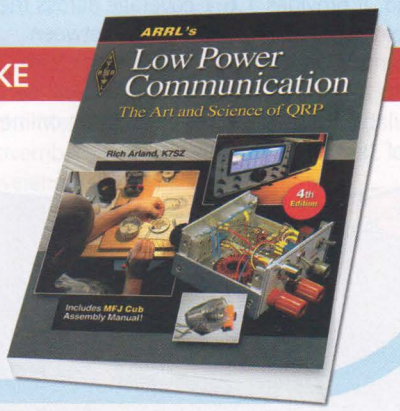
ARRL Low Power Communication

Richard Arland, K7SZ

The fourth edition of *ARRL Low Power Communication* is your guidebook to the fascinating world of low power QRP operating.

ISBN: 9780-8725-9582-8 Size 183x227mm, 320 pages

Non Members £22.99 RSGB Members £19.54



Radio Society of Great Britain www.rsgbshop.org
3 Abbey Court, Priory Business Park, Bedford, MK44 3WH. Tel: 01234 832 700 Fax: 01234 831 496

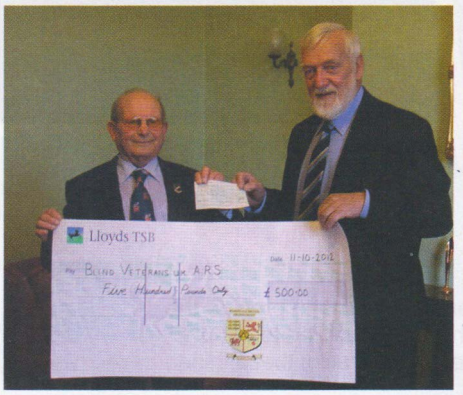
WAB Presentation

You may recall that during the relay of the Olympic Flame on its journey around the UK, The Worked All Britain Awards Group, (WAB), introduced an award (Follow The Torch), tracking its progress.

WAB would like to thank the 70 plus radio clubs and their members who made this possible. Due to their efforts WAB raised the sum of £500 as proceeds from award claims.

Recently this sum was presented by WAB to the Blind Veterans UK (formerly St. Dunstan's) ARC.

Pictured presenting the cheque is Brian Stocks, G0BFJ, (right), who suggested the award and was responsible for its logistics. Receiving the cheque is Blind Veterans UK ARC member, Dick Hardy, G3TIX. www.worked-all-britain.co.uk



Multiband Rotating Dipoles

InnovAntennas has combined open sleeve technology with the OP-DES driven element to produce a shortened rotating dipole that needs no matching devices, no traps, coils or loading. They are built to survive winds in excess of 100mph and with marine grade stainless steel throughout. On the 21/28/50MHz version a guy/spacer is installed to hold all elements straight and in-line to ensure a perfect tune across each band. It provides 1.6:1 coverage across the whole of 21MHz, 2:1 coverage between 28 and 29MHz and 1.2:1 coverage from 50 to 50.5MHz. 40/30m versions will be available in the new range due to be online as of January 2013.

AMSAT-UK Delivers FUNcube-2 Boards

On Friday, 19 October, after some final testing and characterisation checks completed at the facilities of ISIS BV in Delft, AMSAT-UK handed over the set of three PCBs that form the FUNcube-2 subsystem on the UKube-1 spacecraft to Clyde Space Ltd in Glasgow. Clyde Space are leading the development and assembly of this CubeSat project for the UK Space Agency.

The PCBs were taken to Glasgow in a Pelicase by Graham Shirville, G3VZV who handed them to Steve Greenland, Systems Engineer at Clyde Space.

FUNcube-2 on UKube-1 will provide a 435/145 MHz (U/V) linear transponder for amateur radio SSB/CW communications and telemetry for school students around the world.

The UKube-1 spacecraft is expected to be launched on a Soyuz-2 launcher from Baikonur in Kazakhstan in March 2013. UKube-1 is a demonstration CubeSat mission designed to provide a platform for up to three technology demonstrator payloads. In addition to these payloads the satellite will incorporate innovative attitude determination and control systems, deployable arrays, FPGA on board mission controllers.

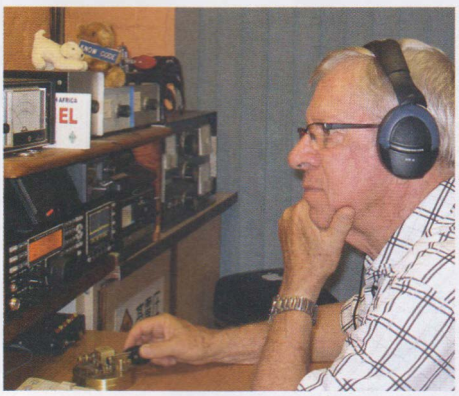
Steve Greenwood of Clyde Space receives the FUNcube-2 boards.

NEWS IN BRIEF

- Amateur Radio in the Country will take place on 21 July 2013 at Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. The theme remains operation and home construction of relatively simple radio equipment with the added attraction of a country setting. The style is more akin to a traditional radio rally of yesteryear, with less emphasis on modern commercially made equipment and plenty of opportunity to meet old friends and discuss radio matters. If the weather allows, it will be outside; otherwise, it will be in the farm barns like this year.

Commonwealth Contest

Vidi, ZS1EL was the winner of the Commonwealth Contest 2012 Prize Draw. The prize, generously donated by Martin Lynch & Sons, was an SDR-IQ receiver. Every entrant who made more than 75 valid QSOs was entered into the draw. More details at www.beru.org.uk.



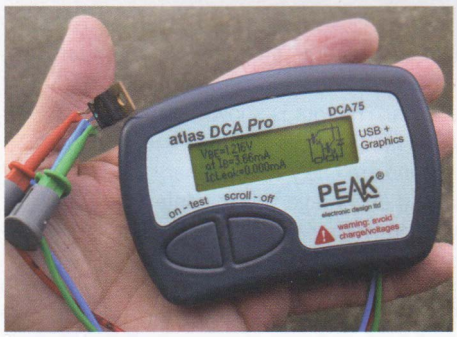
Total Mast Solutions

Total Mast Solutions visited the National Hamfest with their telescopic masts. Following a successful show they are offering a special offer to all Members with a 25% discount on their masts. Quote 'Hamfest 2012' when contacting Total Mast Solutions on 01509 416 972 or e-mail sales@totalmastsolutions.com. Each mast comes with a 2 year guarantee.

New Component Checker

Peak Electronic Design Limited has recently introduced the Peak Atlas DCA Pro (model DCA75) component checker. It is an advanced new design that features a graphics display, USB communications, PC Software and an enhanced component identification library. Components supported include transistors (including Darlingtons, silicon and germanium types), MOSFETs, JFETs, IGBTs (insulated gate bipolar transistors), diodes and diode networks, LEDs and bicolour LEDs, Zener diodes and voltage regulators.

The instrument can be used stand-alone or connected to a PC. Either way, the DCA Pro will automatically identify the component type, identify the pinout and also measure a range of component parameters such as transistor gain, leakage, MOSFET and IGBT threshold voltages, pn characteristics and much more. Price, including VAT, is £115.95, P&P is £3.00 for any size order within the UK.



Youth Opportunity

Are you interested in DXCC, IOTA, DXpeditioning, island chasing, on-band serious activity? If you are under 21 there is a new program to support youth activity on the HF bands. Amateur Radio Supplies LLC, of Haverhill, Massachusetts is looking to help a few lucky young amateurs get on the HF bands and make some contacts! Do you know any deserving young amateurs? They will be giving away three complete HF stations per year in order to support activity on the amateur bands. Details at www.amateurradiosupplies.com/youth-s/222.htm. The first sponsorship will be announced on 1 January 2013.

NEWS IN BRIEF

•The first image received by radio amateurs in Japan from the FITSAT-1 CubeSat on 5840.0 can be seen at www.uk.amsat.org/?p=11151.

Advanced Distance Learning

The Bath-based Advanced Distance Learning group is taking names for their next course, which will run from the end of January to the July 2013 exam. Students that register receive weekly work packages with revision questions and support from one of the e-tutors. Some lessons are supported by short web-based videos. The team now has e-tutors across the country and students are grouped geographically to enable some face-to-face tutorials where possible.

The course is free but a deposit is taken on enrolment to encourage active learning. Students also need to buy the Advance! textbook and pay the standard exam fee at their chosen exam centre. Over two hundred different students have been registered over the last few years and the pass rate for those that sit the exam is well above the national pass rate.

Full details are available from Steve Hartley, G0FUW by e-mail to G0FUW@tiscali.co.uk.

National Hamfest Winners

At the National Hamfest in September several visitors were winners in the raffle. The Yaesu FT60, donated by Yaesu UK, was won by L Dunnam, G6SXB. The Kenwood TM-D710E, donated by Kenwood UK, was won by K Marriott, G6NHY. The XG3 RF signal source, donated by Waters & Stanton, was won by Mr Biggadike, G8JAN. The antenna, donated by LAM Communications, was won by R Nolan, G3KWK. The Icom IC-31E, donated by Icom UK, was won by P Smith, G4LWB. The Wouxan KG-UV920R, donated by ML&S, was won by A Price, M1GAP.

The RSGB and Lincoln Short Wave Club would like to thank all those traders who donated the raffle prizes and the thousands of visitors that took part. A note for your diary, the dates for the 2013 National Hamfest are 27 and 28 September 2013.

NEWS IN BRIEF

•LAM Communications Ltd has a new Approved Radio Repair and Service Engineer, Dave Woods, G4TIW. Licensed in 1982, Dave's expertise ranges from early valve radios to surface mount techniques and VLF to 26GHz.

•Wakefield District Radio Society will be operating the Special Event Station GB0IDD (International Disability Day) from 1 to 3 December from the Wakefield 23rd Troop Scout HQ in celebration of the UN International Day of Persons with Disabilities to publicise this special day. The overall aim is to raise awareness and understanding of disability issues and to promote the independence, inclusion and choice of disabled people and their rights, abilities and well-being worldwide. Operation will be mainly (but not exclusively) SSB on the 14 to 28MHz bands look out for spots on various DX webs. QSL via Eqsl.cc only.

•A new six metre repeater is up and running in south east Cornwall on the same site as the 2m repeater GB3PL. This 6m repeater, callsign GB3GC, has its input on 51.230MHz FM and 500kHz spacing for its output at 50.730MHz. CTCSS is 77Hz. Any enquiries should be directed to Roger, 2E0RPH whose details are correct on QRZ.com.

•The 9-day SOS Radio Week starts at midnight AM on 9 January. The 2012 event raised over £2,900. To register, visit www.sosradioweek.org.uk.

Telescopic tubing

Antenna Engineering is now offering a new range of telescopic aluminium tubing ideal for custom building your own antennas. The 6063 – T6 seamless telescopic aluminium with diameters ranging from 0.875 – 2.125 and are available in 6' lengths.

The tubing has a wall thickness of 0.058" which gives a close tolerance sliding fit into the next section allowing easy assembly and the antenna element can be simply secured with stainless clamps. Adjusting the height of the antenna or element lengths can be done with ease.

The tubing can be purchased individually or as part of an 11 section 60ft telescopic kit for £164. www.antennaengineering.co.uk

Correction

In the Moxon Claw Revisited part 2 (November p36), the length of a half wavelength of coax should have been
Length = velocity factor x 492 / MHz (feet)
rather than
Length = velocity factor x 468 / MHz (feet)
So, when using RG213 coax the length should be a multiple of 23.5 feet rather than 22 feet.
A further comment on the Moxon Claw Revisited appears in The Last Word.

RSGB Centenary Year Events 2013

The four founding members of the London Wireless Club in 1913, Rene Klein, Leslie McMichael, L Francis Fogarty and A P Morgan.

YEAR LONG CELEBRATION. The start of RSGB Centenary Year is almost upon us and celebrations start on 1 January continuing throughout 2013 with a wide range of events marking our Centenary Year.

I hope that some details of the programme in this article will encourage radio activity in the many different facets that we plan to make available throughout the year. The emphasis is definitely on having fun whilst operating radio, and we hope beyond simulating your enjoyment, that this will also attract new people into the hobby. Through presentations at various events, including prepared talks for local clubs to give, we will celebrate the history and achievements by UK radio amateurs and the role of the RSGB over the past 100 years. This will raise awareness of the role the Society has played in supporting and promoting the hobby, working as it does with other national and international bodies.

Formal events will range from the RSGB's 100 year Anniversary Day on 5 July 2013 to other high profile ones such as the RSGB Convention and the National Hamfest. Special events are to take place that will mark our Centenary Year at both UK and at International events.

There will be many less formal events in which all the RSGB membership and all radio amateurs in general, are welcome to join in. Family days, such as a 'BBQ-on-the-Air', where all will get an opportunity to have QSOs with other groups, as well as try ARDF for the first time or in competition are planned. Conventional radio activities will be augmented with a year-long Special Event Station (SES) and a Centenary VHF Field Day and a Centenary IOTA Contest.

We are still seeking ideas and volunteers – individuals, local clubs or special interest groups – to come forward with new ideas to enhance this programme. There is still time to plan things into the programme.

Some of the planned events will be just for a specific day, whilst others will be over a longer period or events repeated at different locations to allow everyone the opportunity to take part and benefit in some way without the need to be near to the conurbations. Some will be designed as activities throughout all the Regions.

CONVENTION-ON-THE-ROAD. There will be presentations on vintage topics as well more up-to-date subjects, and video material, all made available to show at club nights or dinner occasions. Some of these will depict historical events such as the work of amateur radio operators during WWII, and others will show the history of RSGB and its development. Practical demonstrations, replicating the Aerial Circus that Dud Charman, G6CJ developed in the late 1940s, will also be available along with a practical demonstration kit for loan. A list of media will be available from the Centenary website as it develops.

Gx100RSGB. Ofcom have agreed to what is a very special arrangement for the use of the SES callsign Gx100RSGB, where x is replaced by the secondary location identifier, M, W, I, D, U and J etc. The very special nature of the SES is that we are allowed to operate the call at a number of different locations in sequence through the year. The licence plan approved is for thirteen 28 day periods, allowing each RSGB Region to operate the SES against a rota. Within each 28 day period in a Region, the SES may be operated by different clubs or groups, again on a fixed rota. The main stipulation is that these rotas are agreed well in advance (28 to 40 days) so that Ofcom know where and when the SES will be operated. In looking for clubs and groups to support this year long event, as well as operating the main HF bands with CW, SSB and RTTY we are interested for some to run their operations using less common modes and types of equipment than that normally used for SES operations. Coupled with an RSGB Centenary Award, we hope this will create a lot of activity on the bands, so we could get plenty of activity throughout the year. As well as being fun, it should provide an opportunity to try something new, perhaps by individuals joining operating groups, by visiting events or simply chasing the special Award.

Local clubs affiliated to RSGB have been invited to submit an 'Expression of Interest' if they wish to apply to operate this SES station. The rota is shown on page 14. Applications are now flowing in and some regions are likely to be rather busy, so we would encourage you to contact us please via your RM or me at the e-mail address on p14, if you want to join in. RSGB will take care of your SES Licence application and manage the day-to-day rota of SES stations, so minimising the workload. Just to underline this fact, you will not have to make any separate application to Ofcom for using the Gx100RSGB SES callsign.

A live update of the SES rota showing

RSGB meeting, held in 1929.

RSGB Centenary

RSGB Centenary Key

As part of the RSGB Centenary celebrations we are producing a special RSGB Centenary Morse Key to commemorate the event. Made by Vibroplex, one of the world's leading Morse key manufacturers since 1890, this model is not available elsewhere. Based on the popular Iambic paddle key design, this Key will be fully functional and a handsome addition to anyone's shack.

The RSGB Centenary Key will be limited to 250 individually numbered keys. The Keys have a polished chrome mechanism with blue paddles, mounted on a heavy, special gold finish, base. This is complemented by a blue & gold plaque that has the Centenary logo, the production number and, optionally, the owner's callsign. The overall weight is a pleasing 1.7kg ensuring that it is also practical to use.

Please note that the Key numbers will be issued in the sequence ordered and that the Keys will be manufactured and shipped in February 2013. If you are paying by credit card you will not be charged until shortly before production (please ensure any card used does not expire until after March 2013).

Order today to ensure you don't miss out on what is both a collector's item and a functional key that will grace any radio amateur's shack.

SPECIAL OFFER

If you order this key by the 31st December 2012 not only will you be guaranteed delivery in early 2013 but we will engrave the Centenary Key with your callsign free of charge (£14.95 extra after the 31st December)

RSGB MEMBERS
£159.00

NON MEMBERS
£189.00

RSGB shop

Radio Society of Great Britain www.rsgbshop.org
3 Abbey Court, Priory Business Park, Bedford, MK44 3WH. Tel: 01234 832 700 Fax: 01234 831 496

G5RV/P participating in National Field Day in 1949

RSGB at the Leicester Amateur Radio Show in 1996

which stations/operators are authorised to use the SES callsign will be carried on the RSGB Centenary website.

Please contact us via your Regional Manager or myself directly, at the e-mail address below, if you wish to operate the Gx100RSGB SES, have ideas or suggestion for other events or wish to volunteer to help in some way.

Applications to operate Gx100RSGB can be from clubs, groups or individuals as long as the operation is open to the public. Centenary@rsgb.org.uk

CENTENARY AWARD. The purpose of this award is to encourage every radio amateur to get on the air and celebrate 100 years of RSGB in 2013. There will be different levels of award available from a simple Basic award for just 75 contacts throughout the year to a Gold award for 400 contacts. There will be a Special Commemorative Plaque awarded to the holders of a Full UK, Intermediate and Foundation licence, leading SWL and overseas station, who have the highest overall score. Full details will appear in the January 2013 RadCom.

SPECIAL PREFIX. Before leaving the topic of operating, all UK amateurs will be able to apply to use the special V prefix as GV, MV, 2V from 5 July until the end of the month. Further deals on this will be announced nearer to the time.

CONSTRUCTION COMPETITION. In addition to those events for operating radio, a competition is planned to encourage 'home brew' activities. The suggestion is for a number of constructional projects with different levels of difficulty to allow everyone to participate. They may be original or existing designs and even in kit form to ease procurement issues. An award will be offered for the best project in each class although the exact criteria have still to be defined. The date and venue for judging the competition for these awards is likely to be at the RSGB Convention 2013.

As with other activities, we would welcome volunteers coming forward if they have construction projects that may be suitable. We would ask anyone who wishes to suggest a circuit design to contact us please with the technical details. In particular, projects that have a good practical application for use would be ideal.

CENTENARY DAY. The RSGB Centenary Day is on 5 July and the special event callsign will be at the National Radio Centre then. Our Patron, His Royal Highness The Duke of Edinburgh, been invited and we will have more details when we know if he is able to join us for this very special day.

A variety of activities are at planning stage for the whole weekend and we will bring you details in the near future.

GX100RSGB CALENDAR 2013

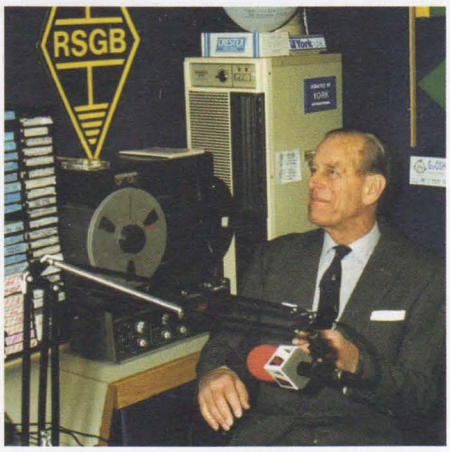
Period	Region	Contact Email
01/01- 28/01	3 North West	rm3@rsgb.org.uk
29/01 – 25/02	2 Scotland North	rm2@rsgb.org.uk
26/02 – 25/03	4 North East	rm4@rsgb.org.uk
26/03 – 22/04	11 South West	rm11@rsgb.org.uk
23/04 – 20/05	10 South and South East	rm10@rsgb.org.uk
21/05 - 17/06	7 South Wales	rm7@rsgb.org.uk
18/06 - 15/07	9 London & Thames Valley	rm9@rsgb.org.uk
16/07 - 12/08	12 East & East Anglia	rm12@rsgb.org.uk
13/08 - 09/09	6 North Wales	rm6@rsgb.org.uk
10/09 - 07/10	13 East Midlands	rm13@rsgb.org.uk
08/10 – 04/11	5 West Midlands	rm5@rsgb.org.uk
05/11 - 02/12	1 Scotland South	rm1@rsgb.org.uk
03/12 - 31/12	8 Northern Ireland	rm8@rsgb.org.uk

Gx100RSGB CALENDAR (JANUARY 2013)

1 to 28 January 2013
Region 3 North West England
Kath Wilson, rm3@rsgb.org.uk

1 & 2 January - Widnes & Runcorn ARC
3 January - Oldham ARC
4 January - Central Lancs Raynet
5 & 6 January - Workington & District ARC
7 January - Workington & District ARC
8 & 9 January - South Cheshire ARS
10 January - Oldham ARC
11-13 January - Furness ARS
14 & 15 January - South Manchester
16 January - South Lancs ARC
17 January - West Manchester RC
19 January - Wirral & District ARC
20 & 21 January - Isle of Man ARC
22 January - Chester & District ARC
23 & 24 January - Bolton Wireless Club
25 January - Southport & District ARC
26-28 January - Warrington ARC

John Gould, G3WKL



The RSGB Patron, His Royal Highness The Duke of Edinburgh, visits GB0OSH at Great Ormond Street hospital.

Upgrade and save money this Christmas With a bhi DSP noise cancelling product!

bhi

NES10-2 MK3 £99.95
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- Rotary filter select switch
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- 3.5 mm mono headphone socket
- On/off audio bypass switch
- 12-24VDC (500mA)

Simply plug-in the audio and connect the power

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10W RMS amplified DSP speaker

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- 3.5mm mono headphone socket
- Loads of audio! - 10-16VDC (2A)

NEIM1031 MKII £129.95
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- Now with 20% more audio & improved filter control knob
- Use with a speaker or phones
- 8 noise filter levels 9 - 35dB
- 12-24VDC (500mA)

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£114.95

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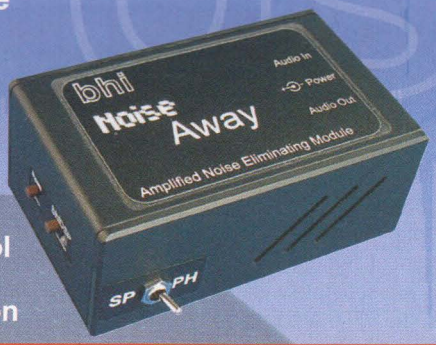
- Audio bypass mode
- 2.5W audio
- 12 -18VDC (300mA)
- Wide audio bandwidth
- Easy pushbutton control
- Use inline with your headphones or extension speaker



DSP modules to retrofit inside your radio or speaker...

NEDSP1061-KBD £89.95

- Low level audio module for Yaesu FT-817, FT-897, FRG-100, Icom 706 MKII G Kenwood TS-50, TS-440, Realistic dx-394, Alinco DX70, DX-77 and other radios or receivers!

NEDSP1062 KBD £94.95

- 3W audio output (4ohm)
- 8 filter levels 9-35dB
- Audio bypass
- 12-18VDC (300mA)
- Simple pushbutton control
- pre-wired for easy install
- Fit in Yaesu SP-8, Kenwood SP-31, Icom SP-21 and other similar speakers

bhi 10 year anniversary Sale now on *(offer ends 31/12/12)*

Radio Mate
Compact Keypad for the Yaesu FT-817,FT-857 & FT-897 Makes it easier to use your Radio with simple shortcuts
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Now with 40 memories and new frequency nudge mode! Enjoy your radio again!

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Connect two radios to your bhi DSP noise cancelling speaker or In-line unit.
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- Wide audio input
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ACOM 1500

1500W linear amplifier for HF + 6m

INTRODUCTION. Acom have recently added a new product to their popular range of linear amplifiers. The Acom 1500 is a manually-tuned valved design covering the bands from 1.8 to 50MHz. Delivering 1500W PEP output or 1200W continuous carrier output on RTTY, this is the highest power amplifier in the Acom range that also covers 6m. Building on the well-proven Acom 1000, it adopts a similar circuit configuration and uses an up-rated power supply, together with comprehensive protection circuitry that is a feature of other amplifiers in the Acom range.

PHOTO 1: The Acom 1500 linear amplifier.

FEATURES. The Acom 1500 is a self-contained amplifier with the RF assembly and PSU in one cabinet. It measures 422mm wide by 195mm high by 355mm deep and weighs 26.5kg, similar in size to but somewhat heavier than the Acom 1000. It uses a single 4CX1000A ceramic-metal tetrode that is somewhat larger both physically and electrically than the GU74B / 4CX800A valve used in other Acom amplifiers. Full output is achieved with around 60 to 85W of drive.

The amplifier uses conventional tune, load and bandswitch controls. These are fitted with large knobs for ease of use. The primary mains power switch is located on the rear panel and this enables the control system; the switch on the front panel powers up the amplifier. Three antenna sockets are provided, selectable from the front panel. To prevent accidentally transmitting into no load, access to unused sockets can be disabled. Switching antennas automatically by band is not provided.

A green high brightness vacuum fluorescent display (VFD) is used to indicate the various operating conditions of the amplifier and pushbuttons adjacent to the display select the various display functions. The amplifier is switched from the transceiver via a 'ground to transmit' key-in line. Around 6mA current flows when this line is shorted to ground and the open circuit voltage is +12V. Transmit/receive switching is fast and allows CW full QSK operation. A key-out line is also provided for transmit inhibit or sequence keying of the radio if needed. This provides ground on transmit, mirroring the key-in line with a slight delay. There is no provision for ALC feedback.

A comprehensive protection and monitoring system is provided to protect the amplifier against excessive drive, incorrect tuning and fault conditions. Also provided is a handy tuning aid (**Figure 1**) to allow simple and rapid tuning of the amplifier. This is called True Resistance Indicator (TRI). Tuning Pi networks is traditionally a two-handed process as the tune and load controls interact. By suitable processing, the correct settings for the tune and load controls are separately identified and displayed on the VFD. A bargraph indicator is used to peak the tune control and on a separate scale a marker shows where the loading control should be correctly set and whether to rotate the knob to the left or to the right. Initial tuning is done at reduced power and a 6dB attenuator is automatically inserted into the drive path when the settings are away from optimum. This is disabled when the tuning is near optimum.

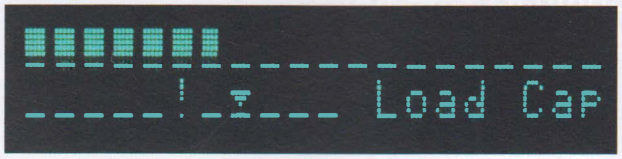

FIGURE 1: The TRI tuning display.

The 21 page manual is well written, fully describes the operation and shows a simplified circuit diagram and a comprehensive specification.

DESIGN AND CONSTRUCTION. The valve operates in grounded cathode with a cathode resistor to provide some DC and RF negative feedback. The drive power is applied to a load resistor across the control grid through a matching transformer. This provides a passive broadband match without any input bandswitching and yields a low input VSWR across the whole frequency range. The amplifier uses a Pi-L output tuning network for good harmonic rejection and this will match into antenna VSWRs up to 3:1. Additional filtering ensures VHF harmonics are further reduced. This is particularly important with the second harmonic of 6m falling inside the FM broadcast band. A Gigavac vacuum relay is used for antenna switching. This is very fast to operate and has a rubber mount to minimise noise.

The principal weight of the amplifier lies in the heavy-duty transformer that dominates the power supply unit. Mains voltage taps are selectable in 10V increments and a step-start circuit is used to limit the inrush current. The power supply uses a full wave bridge rectifier to provide the anode supply of nominally 2800V and additional circuitry provides the supplies for the screen, control grid, heater, fans, relays etc. Acom claim that the power supply is tolerant of mains voltage fluctuations, dips and spikes and is suitable for use with generators on field days and DXpeditions.

In common with all Acom amplifiers, the 1500 is superbly constructed on an anodised aluminium frame with a wrap around case. Interlocks disconnect the AC power and short the HT to ground when the case is removed. A dividing screen separates the RF deck from the power supply and the RF deck is also separately shielded. The control circuitry is located fully shielded behind the front panel. The output network components are very substantially rated with much silver plating in evidence on the inductors and connecting straps, and with ceramic insulated tuning capacitors,

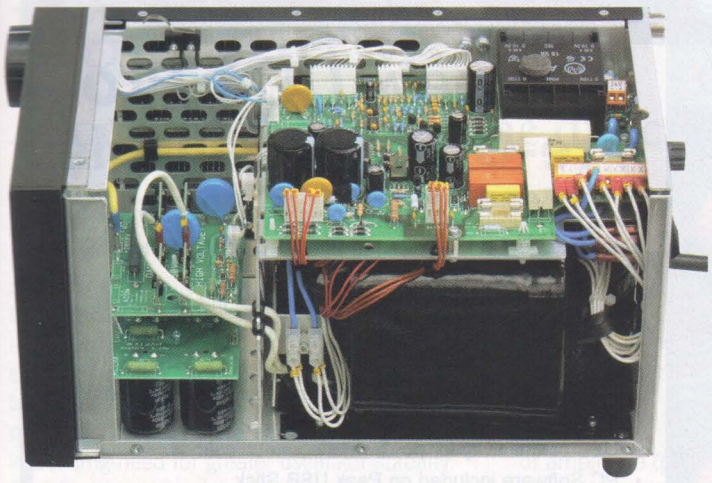

PHOTO 2: The power supply section is dominated by the hefty mains transformer.

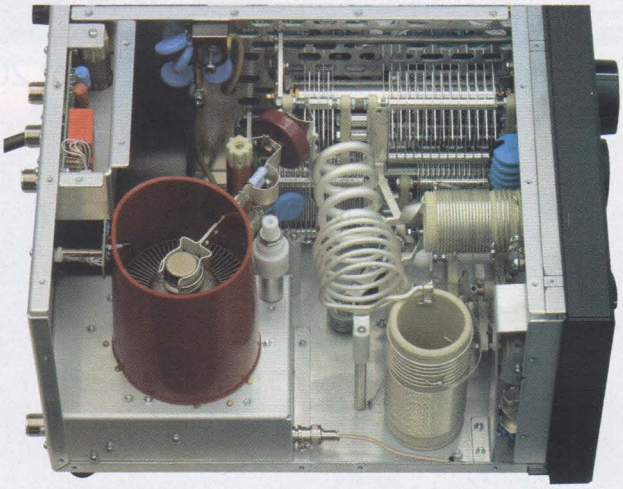

PHOTO 3: The RF deck. Output network components are very substantially rated, with much silver plating in evidence.

ceramic bandswitch and inductors and chunky 'door-knob' ceramic capacitors. Full cabinet forced air cooling is provided, with a centrifugal blower mounted internally on the side of the grid box. Air is drawn in through the rear panel, past the transformer and PSU circuitry, through the output tuning components and into the grid box. The air is then forced through the valve anode via a silicone rubber chimney, past the temperature sensor and vented out through the top of the case. The fan engages a higher speed as the temperature rises and for high duty cycles or high ambient temperatures an additional fan should be fitted on the rear panel. Provision for an external 24V fan is included on the control board.

PROTECTION AND CONTROL. Extensive circuitry is incorporated to monitor operation and protect the amplifier from a host of potentially damaging conditions. With this auto-protection system, sensors are incorporated to allow the control circuitry to monitor forward and reflected power, drive power, anode DC voltage and current, peak RF anode voltage, screen current, control grid current, control voltages and exhaust air temperature. From these measurements other parameters are computed, for example antenna VSWR, output power, relay closure and a novel arrangement to detect the presence of arcs. Pushbuttons scroll through the measured parameters and allow them to be viewed on the display, one line at a time.

Associated with these measurements are limit levels that, if exceeded, are flagged immediately onto the display and may operate trips. The first level of protection reports when limits are getting close, eg "reduce drive". The second level trips the amplifier back to the standby condition in the event of a soft fault, eg high VSWR or excess drive. The third level shuts off the AC power in the event of a hard fault, eg a major problem or a supply failure. The status of these hard faults is stored in non-volatile memory and the last seven conditions, or signatures, may be recalled to the display for analysis. The status error codes are given in the manual and an Excel application is also available from Acom free of charge to decode the signatures.

PERFORMANCE. Measurements were made on the amplifier under CW and two-tone SSB conditions. As the linearity of the amplifier is potentially better than most transceivers, care must be taken to use a low distortion two-tone drive source. This was fabricated using two transceivers operating on CW with 5kHz frequency spacing coupled together with a high power hybrid coupler. This arrangement yielded around 80W PEP drive power with residual intermodulation products at -50dB or below.

I found the TRI tuning aid easy to use and it enabled the amplifier to be quickly set on frequency. However, I found that the initial settings for the tuning controls given in the user manual were somewhat wide of the mark and you would be well advised to compile your own table based on the settings needed for your own antennas. Tuning at the 1200-1300W level, the amplifier would then drive easily to 1500W PEP.

The amplifier delivered 1200W output with 60 to 80W drive power depending on the band and 45W drive on 50MHz. The indicated power was within 5%. The harmonic rejection measured 50dB on 1.8 and 3.5MHz, around 54dB on bands from 7MHz to 21MHz and in excess of 70dB on the higher bands. The input VSWR was 1.25:1 or better over the frequency range.

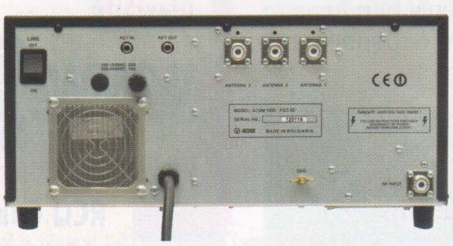

PHOTO 4: The rear panel is uncluttered.

Two-tone distortion levels depend on tuning to a certain extent. Tuning initially was done on CW at 1300W output with loading set according to the TRI tuning aid. Two-tone results then measured typically -32dB for 3rd order products relative to PEP at 1.0 to 1.5kW PEP output and significantly better for 5th order. A slight touch of the loading to the right on the TRI scale improved distortion figures to -38dB. The two-tone waveform was clean with negligible 100Hz hum modulation. The switching speed between receive and transmit was quite fast, settling in about 7ms. Putting this into perspective, the dot length of a CW character at 40wpm is 31ms.

After switching on the amplifier, it takes 3 minutes for the valve to heat up before the amplifier is ready to use, the time counting down on the display. This can seem interminable if you are in a hurry. The amplifier performed very well on all modes including full CW QSK and no problems were experienced. The blower is quiet in operation and should not be obtrusive, becoming somewhat noisier when the exhaust air temperature rises. The relays are amazingly quiet and only just audible even under full QSK. Tuning was well behaved but a little critical on 10MHz and, to a lesser extent, 50MHz.

CONCLUSIONS. The Acom 1500 is a well-built and well-protected amplifier delivering 1500W PEP output (1200W full carrier) on all HF bands and 50MHz. It is always desirable to operate amplifiers well within their maximum output and at 400W this amplifier is very docile and should give a long life. The extra power is useful for situations that allow and to overcome those lossy long feeder runs. The amplifier is available in the UK from Vine Antennas Ltd at a price of £2750 inc VAT. My thanks to Vine Antennas for the loan of the amplifier for review.

Homebrew

A local oscillator for the direct conversion receiver

HARD WORK. Designing and building a stable and clean local oscillator has always been one of the biggest challenges for the amateur radio designer and constructor. Ever since the change from damped-wave (spark) to carrier wave transmitters in the early part of the last century there has been an ever-increasing need for greater oscillator stability. This trend continues today as narrow bandwidth modes like QRSS (CW with very slow on/off keying) and digital modes such as PSK31 place new demands on oscillator stability.

The ideal local oscillator would:

- Produce a perfect continuous sine wave without distortion of any kind
- Have all of the output energy at the intended output frequency
- Have no harmonic output
- Have no spurious signals
- Have no noise from the oscillator, buffer amplifiers or power supply
- Have no long term frequency change (drift)
- Have no short term variations in phase or amplitude (phase noise, jitter, hum, etc).

PHOTO 1: An electric fire element provides a very useful ceramic former plus some resistance wire for the junkbox.

Such an ideal oscillator doesn't exist in the real world. Perhaps the closest we can get to meeting that list of requirements is a well designed quartz crystal oscillator. If the crystal is kept at a constant temperature, frequency drift can be almost eliminated. Noise can be minimised by using high quality passive components and low noise active devices for the oscillator and buffer amplifiers. The DC supply must be well filtered so that the oscillator isn't modulated by noise from the power supply. For the most critical applications, a battery supply may be the best option.

QUARTZ ISSUES. One major problem with quartz crystal oscillators is the lack of frequency agility. It is possible to 'pull' the frequency of crystal oscillators by a small amount by placing capacitive or inductive reactance in the crystal circuit. For example, oscillators used in frequency critical applications like a clock or frequency counter timebase often use a trimmer capacitor in series with the crystal for fine adjustment of the oscillator frequency. Inductive reactance can be used to pull the oscillator to a lower frequency. There are a number of problems with this approach. In most cases, the tuning range is very limited. High-Q crystals are usually limited to just a few kHz around the crystal resonance. Crystals with a lower Q and some types of ceramic resonator can be pulled by a greater amount. This may result in a more useful tuning range, particularly if a frequency multiplier is used for HF or VHF coverage.

Using external reactances to pull a crystal will tend to reduce oscillator stability. As a general rule, the loss of frequency stability will be proportional to the deviation from the crystal resonance. Crystal resonators have a much higher Q than L/C resonators. Introducing relatively low-Q external reactances into a crystal oscillator can cause unreliable operation due to increased circuit losses. Frequency 'jumping' can also be a problem.

We sometimes tend to think of crystals as a perfect series resonant circuit. In reality, crystals have series and parallel resonant modes and often have more than one resonant frequency. Extreme frequency pulling may cause the oscillator to jump to a different mode or resonance. In some cases, the oscillator may stop working at the crystal resonance and instead oscillate at the resonant frequency of the external reactances in the pulling circuit. This can cause extreme frequency jumps of many MHz, which would be very inconvenient in a receiver and even worse in a transmitter, where it would probably cause out-of-band spurious signals.

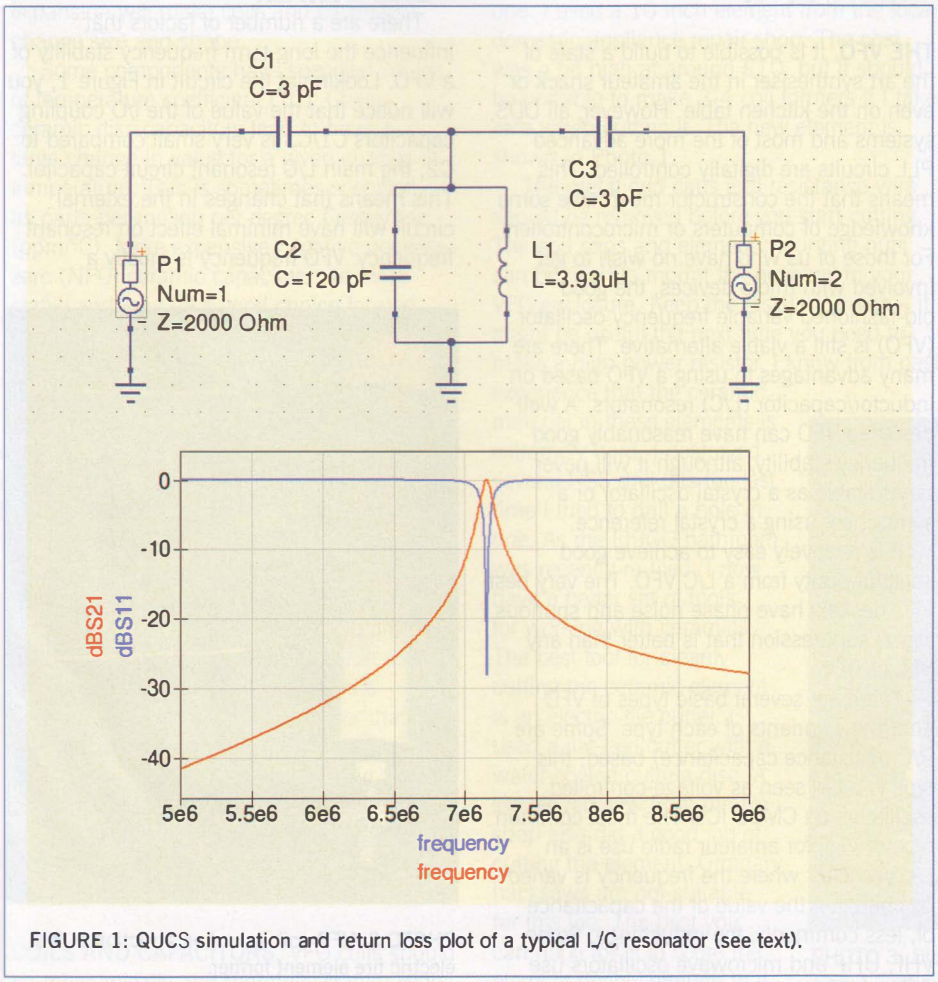

FIGURE 1: QUCS simulation and return loss plot of a typical L/C resonator (see text).

SYNTHESISERS. Modern frequency synthesisers provide a solution to most of the problems just described. Phase locked

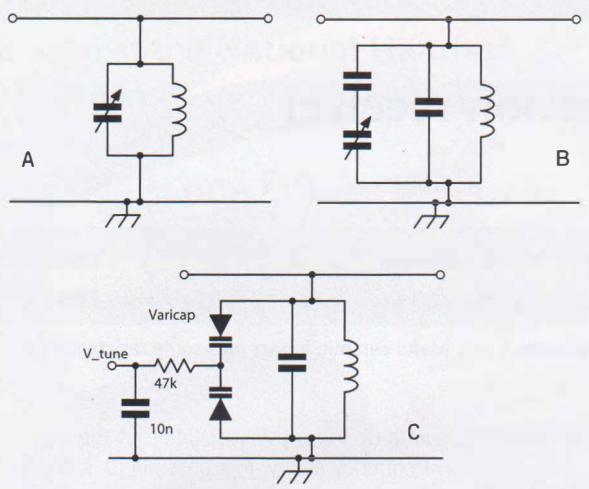

FIGURE 2: Different ways of tuning an L/C resonator (see text).

loop (PLL), direct digital synthesis (DDS) or a combination of both can provide a local oscillator signal that is virtually free of long-term drift. As usual, there are some compromises involved.

A typical PLL synthesiser imposes good long-term stability on a variable oscillator (usually a voltage controlled oscillator) by comparing its frequency to that of a stable reference oscillator. Phase/frequency errors are corrected by varying the VCO control voltage to compensate for drift. As the VCO is usually just a simple variable frequency oscillator, the output spectrum will be free of any out-of-band spurious signals. But, as the PLL is making constant corrections to the VCO frequency, there will always be some phase noise added to the oscillator signal. The PLL synthesiser tends to have very good suppression of spurious signals at frequencies well removed from the output frequency. Close-in phase noise tends to be relatively high compared to other types of oscillator. When a relatively low reference frequency is used at the phase/frequency detector, this may cause spurious outputs spaced from the carrier at multiples of the reference frequency.

The DDS has different characteristics from the PLL. The output from a DDS comes from a digital to analogue converter (DAC). Provided that the DAC is perfectly linear and the DDS clock is free of jitter/noise, the DDS output will be clean. In practice, the DACs and their associated circuits are not perfect and the output will not be a perfect approximation of a sine wave. DDS ADCs have limited bit depth (usually 10-14 bits). DDS systems are usually connected to electrically noisy microcontroller systems, which may cause spurious signals at the output.

The DDS output signal contains the wanted output, the clock frequency, the alias signal(s), harmonics of all of the above plus noise and distortion from the DDS and digital control circuits.

The DAC output is usually followed by a low pass filter (LPF). Most DDS designs limit the output to a frequency well below the theoretical maximum of half the clock frequency (f_clock/2). Many references suggest f_clock/3 as a more realistic upper limit. The LPF will remove the clock and alias signals, leaving the wanted output signal plus any unwanted 'spurs' that fall below the LPF cutoff frequency. In practice, it is possible to get good results if you limit the output frequency to a small fraction of the DDS reference clock frequency. You should use the best DDS technology available. The newer 14 bit devices are significantly cleaner than the old 10 bit DDS chips. See the spectrum plots for the AD9951 in the October 2011 Homebrew.

Many commercial rigs use a PLL/DDS hybrid synthesiser. This gives the best of both worlds: the excellent close-in phase noise performance and very small tuning steps of the DDS and the excellent spur rejection of the PLL.

THE VFO. It is possible to build a state of the art synthesiser in the amateur shack or even on the kitchen table. However, all DDS systems and most of the more advanced PLL circuits are digitally controlled. This means that the constructor must have some knowledge of computers or microcontrollers. For those of us who have no wish to get involved with micro devices, the good old-fashioned variable frequency oscillator (VFO) is still a viable alternative. There are many advantages to using a VFO based on inductor/capacitor (L/C) resonators. A well designed VFO can have reasonably good frequency stability, although it will never be as stable as a crystal oscillator or a synthesiser using a crystal reference.

It is relatively easy to achieve good spectral purity from a L/C VFO. The very best VFO designs have phase noise and spurious signal suppression that is better than any PLL or DDS.

There are several basic types of VFO and many variants of each type. Some are R/C (resistance capacitance) based; this type is often seen as voltage-controlled oscillators on CMOS ICs. The most common type of VFO for amateur radio use is an L/C oscillator where the frequency is varied by changing the value of the capacitance or, less commonly, the inductance. Some VHF, UHF and microwave oscillators use transmission line resonators instead of the L/C circuit.

Figure 1 shows a QUCS simulator transmission (red) and return loss (blue) plot of a typical L/C resonator as used in a VFO. Input/output coupling is via a pair of low value capacitors. The I/O ports are terminated by a resistance of 2000Ω. This value was chosen because it is a reasonable approximation of the optimum gate and drain impedances for a JFET in a small signal amplifier or oscillator. L1 and C2 are actual values used in the prototype VFO. The circuit is basically a band-pass filter designed for a narrow bandwidth (high loaded Q) and relatively high termination impedances.

PRACTICAL CONSIDERATIONS. Building a stable VFO has always been regarded as something of a black art. Many of us have gone to great lengths to build a good VFO using high quality components, careful construction, good screening and buffering, only to be disappointed by the poor performance of the finished project. On other occasions, we might have achieved excellent performance from a hastily constructed, badly screened pile of junk. In other words: when you build a one-off project like a home made VFO, instant success is not guaranteed. However, there are a few basic rules that will probably increase your chances of success.

There are a number of factors that influence the long-term frequency stability of a VFO. Looking at the circuit in Figure 1, you will notice that the value of the I/O coupling capacitors C1/C3 is very small compared to C2, the main L/C resonant circuit capacitor. This means that changes in the external circuit will have minimal effect on resonant frequency. VFO frequency is mostly a

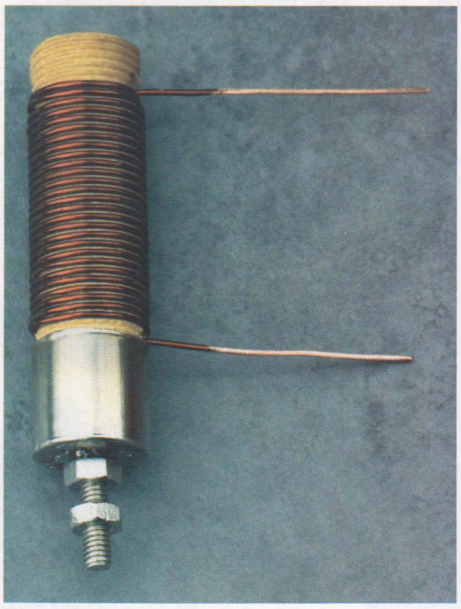

PHOTO 2: VFO coil wound on a section of the electric fire element former.

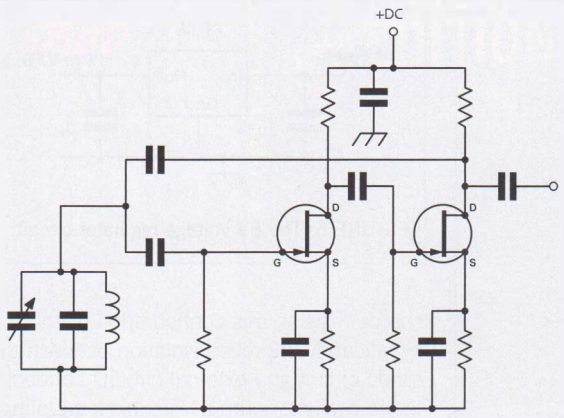

FIGURE 3: The classic Franklin oscillator circuit.

function of the resonant frequency of the L1/C2 parallel resonant circuit. If these values can be kept constant, the VFO will tend to be stable.

Mechanical stability is an important part of VFO design and construction. Capacitors and coils should be fixed firmly in place. A rigid metal enclosure will provide good mechanical stability, electromagnetic screening and also environmental screening against sudden changes in temperature. Inductance and capacitance is a function of the size, shape and physical properties of components. This tends to change with temperature. As the equipment warms up, expansion will make coils and capacitors change size and shape.

Some components have specified values of temperature coefficient (TC). Cheap ceramic disc capacitors tend to have a large change in value for a given change in temperature. This is sometimes specified as parts-per-million per degree Centigrade (ppm/°C). More expensive negative-positive-zero (NP0) ceramic capacitors are more stable and may be a good choice for use in a VFO. Polystyrene and some types of silvered-mica capacitors are also widely used in applications where good stability is required. As some oscillator components will have a positive value of temperature coefficient (PTC) (value increases with rising temperature) and others a negative temperature coefficient (NTC), it is possible to build a temperature compensated oscillator by using a mixture of different capacitor types. This is a tricky and time-consuming process, but it can yield excellent results. Some older equipment has a temperature compensation trimmer that consists of a differential capacitor with a PTC capacitor connected to one side and a NTC capacitor connected to the other. Any required value of temperature coefficient (TC) can be achieved by simply adjusting the trimmer.

COILS AND CAPACITORS. VFO coils should be mechanically and thermally stable. High permeability magnetic cores are rarely used in HF VFO coils. Such cores tend to have relatively poor thermal stability. Low to medium permeability powdered-iron cores are sometimes used in VFOs. Coils wound on this material are not usually as stable as coils wound on ceramic or glass formers, but the reduction in coil size may be a good trade-off for a small reduction in stability, particularly for LF/MF coils.

The classic HF VFO coil is wound on a ceramic former using fairly large diameter copper wire. Such coils have high-Q and excellent thermal stability. Happily, high quality ceramic coil formers are still readily available. You just need to know where to look. A section cut from a 1kW electric fire element makes an excellent coil former. It is designed to remain stable over a very wide temperature range and it has a spiral groove along its entire length that can be used to keep your coil turns held firmly in position. A used element from an old heater is at least as good as a new one; it may even be better because it has already been through many hot/cold cycles. A blown or damaged element will also do just as well as a new one. I used a 10 inch element from the local domestic appliance repair shop. The cost was a bit high at around £10, but it should be possible to make 3-4 coil formers if I take care when cutting it. The new element is shown in **Photo 1**.

The metal end caps and resistance wire should be removed before you start cutting. The end caps and element mounting nuts can be used to mount the new coil in your VFO enclosure. Keep the resistance wire – it might be useful the next time you need to make a high power resistor. I know from past experience that the ceramic material in these elements is extremely hard. I destroyed several HSS drill bits the last time I tried to drill a hole in one. As the EI9GQ bathroom was recently re-tiled, I now have a better set of tools for working with ceramics. The best tool for cleanly cutting the ceramic element is an electric tile cutter. I used a flat-bed cutter with a water cooled cutting disc. A simple rod saw from the tile shop also did a good job of cutting the element. Ordinary hacksaws are not suitable for this job. The best you can hope for is to score the element deeply enough that you can break it cleanly over a sharp edge. The end result is unlikely to be a clean break and your hacksaw blade will end up in the bin. Whatever method you decide to use, make sure you wear eye protection.

As the coil former was cut from one end of the element, it already had one hole and a nice shiny end cap for mounting it in the VFO enclosure. I drilled a second hole to secure the other end of the coil using a 6mm special drill bit for ceramic tiles. I would have preferred to use a smaller drill size, but the 6mm drill was available at no extra cost. For the first attempt at winding a VFO coil, I wound approximately 27 turns of 0.8mm enamelled copper on the former. I say approximately because the wires at each end only form a half turn because of the way they are pulled through the holes in the former. Winding the coil tightly and taking care to keep the wire in the groove resulted in a neat looking and physically stable coil. I didn't feel the need to put a small blob of epoxy in the holes at each end to secure the coil. The LC meter (May 2008 Homebrew) showed a measured inductance of 3.93μH. This is an inductive reactance of 175Ω at 7.1MHz, 123Ω at the standard VFO frequency of 5MHz and 91Ω at 3.7MHz. The coil should be quite suitable for use at any of these frequencies. Based solely on the fact that I am too lazy to change the number of turns, I decided to build a 40m VFO. This will be used as the VFO for the direct conversion receiver that was described last month. For future reference, we now know that this type of coil has an inductance of approximately $5.391xN^2$ nH where N^2 is the number of turns squared, ie: 5.391 x 27 ^ 2 = 3930nH. The new VFO coil is shown in **Photo 2**.

Inductive reactance at 40m is $2 \times \pi \times 7.1 \times 3.93 = 175.3\Omega$. The required capacitance to make a 7.1MHz resonator is 10 ^ 6 / (2 x π x 7.1 x 175.3) = 128pF. There are many possible configurations for

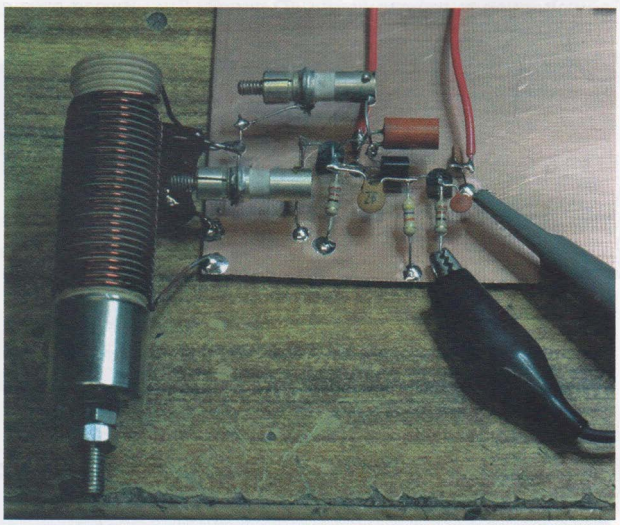

PHOTO 3: Close-up view of the construction of my prototype VFO circuit (without the main variable capacitor, C1).

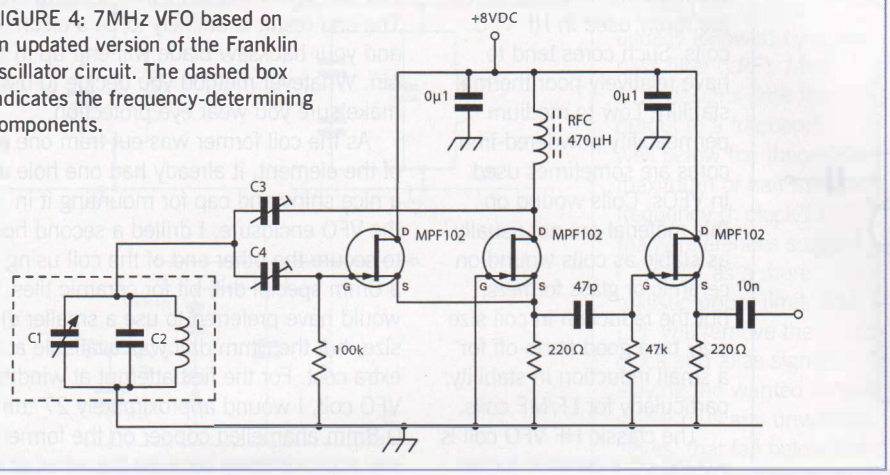

FIGURE 4: 7MHz VFO based on an updated version of the Franklin oscillator circuit. The dashed box indicates the frequency-determining components.

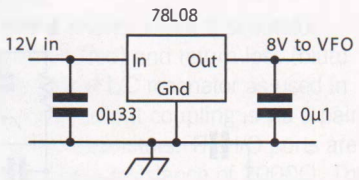

FIGURE 5: The 8V voltage regulator circuit.

the L/C resonant circuit. **Figure 2A** shows the simplest possible configuration. The variable capacitor would need to have a maximum value of more than 128pF. The tuning range would be much greater than required to cover the 40m band. The improved circuit at **Figure 2B** has most of the circuit capacitance in a fixed capacitor. This is connected in parallel with a small value variable capacitor. If necessary, another fixed capacitor can be placed in series with the tuning capacitor. This will reduce its maximum value and further reduces the tuning range so that only the amateur band is covered. For best results, the tuning capacitor should be an air spaced double bearing type. Tuning capacitors from old VHF FM broadcast receivers are ideal for this application. The capacitor should be fitted with a reduction drive. If a suitable tuning capacitor is not available, it is possible to use varicap diodes to tune the VFO. The circuit at **Figure 2C** shows how a dual varicap or a pair of identical varicap diodes can be used to tune the VFO. The tuning voltage usually comes from a multi-turn pot and voltage regulator.

VFO CIRCUIT. So far, we haven't given any attention to the choice of VFO circuit configuration. Most of the commonly used oscillator topologies are capable of good results. One particular configuration that has served me very well in the past is known as the Franklin oscillator. **Figure 3** shows the classic Franklin oscillator. The circuit consists of a pair of common source (or common cathode in the case of valves) inverting amplifiers and an L/C parallel resonant circuit. Each of the inverting amplifiers provides a 180° phase shift so that the total phase shift of the two amplifiers is 360°. Some of the output from the second amplifier is fed back to the input of the first amplifier via the L/C resonant circuit. I/O coupling to/from the L/C circuit is via a couple of very small capacitors. Typical values for the coupling capacitors are in the 2-5pF range. Because of the 360° phase shift in the amplifier the feedback is positive. This satisfies the required condition for oscillation. The frequency of oscillation is determined mainly by the components in the L/C resonant circuit.

The VFO circuit topology chosen for this month's construction project is a more modern variant of the Franklin oscillator. The schematic of the VFO and its buffer amplifier is shown in **Figure 4**. This oscillator is also based on a pair of JFET amplifiers. The first FET is configured as a source-follower (common drain) amplifier. The second FET is configured as a common-gate amplifier. Note that the gate of this stage is connected directly to ground. Both FETs share a common source resistor for inter-stage coupling. This configuration requires fewer components than the classic Franklin circuit. As the output is taken across the source resistor, this configuration offers significantly improved isolation between the tuned circuit and external circuits connected to the oscillator output. Feedback coupling is via a pair of 1.5-5pF piston trimmers.

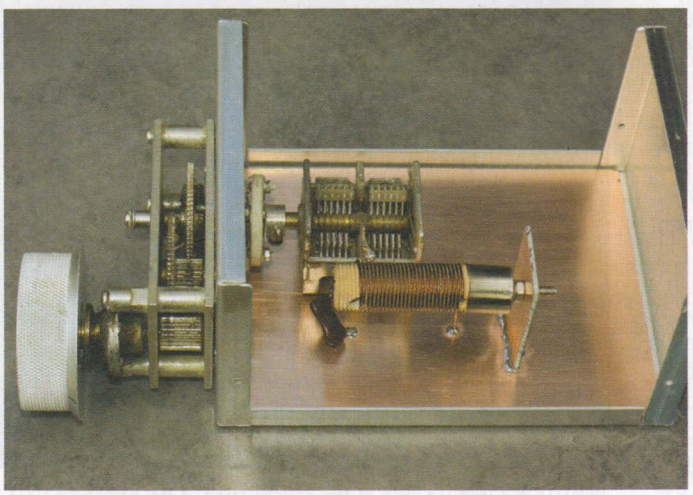

PHOTO 4: General view of the resonant circuit and reduction gearing.

The choke in the drain circuit is a 470µH moulded type. If a suitable choke is not available, you can use 37 turns of thin enamelled copper on a FT37-43 toroid core instead. C2 is 118pF, 1% tolerance, 500V silvered-mica. The nearest standard values are 120pF or 110pF. C1 is one half of a VHF dual-gang tuning capacitor. C3 and C4 were set about half way out for a capacitance of around 2.5pF. This value turned out to be just about optimum for reliable starting and best output waveform. The 8V DC supply for the VFO and buffer amplifier comes from a 78L08 100mA voltage regulator. This is shown in **Figure 5**. A close-up photo of the prototype circuit is shown in **Photo 3**.

TESTING. When the power was connected, the oscillator immediately came to life with an output voltage of 1.5V pk-pk. The measured output frequency was quite close to the required value. With the tuning capacitor in the fully open position, the output frequency was 7.1MHz. Removing half a turn from the end of the VFO coil increased the maximum frequency so that the entire 40m band is covered. I used a high quality 36:1 geared reduction drive between the large tuning knob and the tuning capacitor. The reduction drive was recovered from scrap equipment. Operation is slow and smooth, which allows for easy tuning of SSB and CW signals. After the slight modification to the coil, frequency coverage is from just below 6MHz to just above 7.5MHz. As this is a bit more than required, I will probably add a fixed capacitor in series with the variable capacitor as shown in Figure 2B. The oscillator was placed an aluminium project box (eg Maplin AB31 or similar). The coil, capacitors and 36:1 drive can be seen in **Photo 4**.

After a one hour warm-up period, oscillator drift was measured at a remarkably good 10Hz per hour. It isn't possible to evaluate the performance of a VFO based on a single test, but the initial results look very encouraging.

Next month: more VFO testing – and the frequency dial.

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see page 78 for full details

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RSGB Yearbook 2013 - Centenary Edition

Edited by Steve White, G3ZVW

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2012L

Celebrating the London 2012 Olympic and Paralympic Games

PLANNING. As soon as London was announced as the venue for the Olympics, the Cray Valley RS team started their planning. The core team of Bob, M0MCV, Dave, G4BUO and Mark, M0DXR first met with LOCOG in 2009 to explain their plans. It was important to sign up to the Inspire Programme, which would give them the ability to use the Games logo on the website, QSLs and publicity material. They learned early on from LOCOG of the severe branding restrictions that were much in the news throughout the Games – and these gave significant problems later on.

Cray Valley's home patch is Eltham, which is in the Royal Borough of Greenwich, one of the host boroughs for the Games. The group started to formulate plans and met with the Council and community groups and with the MP for Eltham, Clive Efford. Clive wrote on their behalf to the Chief Executive of English Heritage, Dr Simon Thurley, seeking permission to operate from Rangers House, which is on the edge of Greenwich Park, the venue for the equestrian events.

The Chief Executive of English Heritage replied that Rangers House would not be available but instead gave permission for the use of Eltham Palace. This prestigious building close to the centre of the town seemed very well suited and they started making detailed plans with the local manager. From the beginning, they felt it essential to cover the period of both the Olympic and Paralympic Games, which in practice meant being operational during the two-week pause between the Games. This meant being operational for a total of 47 days.

While developing detailed plans with English Heritage, they had further meetings with LOCOG and with Ofcom, securing agreement for use of the 2012 prefix. Barry ARS also enthusiastically took up the challenge and successfully organised 2012W.

Saif, A71AM operating HF1 on 20m.

PROBLEMS AND SOLUTIONS. Cray Valley RS had been successful in raising funding for previous event but, when it came to 2012L, the branding restrictions caused difficulties. Unlike 2012W, who secured funding from the Welsh Assembly and from the Lottery, their carefully prepared applications for grants were turned down because there were so many competing projects in the London area.

They were dealt a further blow only four months before the start of the operation when the use of Eltham Palace fell through. Through their contacts with the local Scouting organisation they were given the use of the Royal Greenwich District Scout Activity Centre in New Eltham. This proved an absolute godsend and Cray Valley RS cannot express deeply enough their gratitude to the Scouts for stepping in and rescuing the project.

Plans were revised and they found two positive outcomes: first, budgetary worries were reduced as there were no staff costs to meet and secondly, there was more room for antennas. In the event, the only disadvantage of the change of location was that there were fewer casual visitors to the station: they were visited by many amateurs from the UK and overseas, but visitor footfall was nothing like as good as for 2012W, situated on the seafront at Barry Island. They did, however, have visits from Scouts, Guides and their leaders and they were able to spread the word about amateur radio far and wide among the Scouting movement.


Sunset at 2012L.

EQUIPMENT.

The HF design for Eltham Palace had involved three trailer mounted crank-up towers supporting monoband antennas, though space was going to be tight and there would be problems with the feeder runs. This design was transferred to the new site and they were able to spread out the towers a little more.

VHF Manager Chris, G0FDZ had planned for just two VHF masts supporting small Yagis for 6m, 4m and 2m, located very close to the Palace. The move to the Scout site enabled them to increase the size of the VHF Yagis and have separate masts for each of the three VHF bands. Having lost most of 70cm to the Olympics, they decided to omit that band completely from the operation.

They planned to use the club's IC-756 PRO III and a donated FT-1000MP. Putting out feelers among their friends and supporters yielded the loan of an FT-2000 from Neville, G3NUG, an Alpha 89 amplifier from Nigel, G3TXF and the Newbury & District ARS made available both of their Quadra amplifiers. The only constraint was that they needed them for the first week for their entry in the IOTA Contest from the Isle of Wight. Club member Dave, G3RGS came to the rescue with the loan of his Acom 1000 for the first week. Also in the first week they used the Club's FL2100z, which had two extra fans retrofitted by Guy, G0UKN and, somewhat to their surprise, it was good for in excess of 6,000 contacts in the first week of operation.

For VHF, CDXC loaned one of their DXpedition FT-450 transceivers, complete with PSU and headset, which was used on 6m. Frank, G4WNF made his FT-847 available for the 2m station and on 4m they used the Club's FT-757 and ME4T transverter. There were plans for backup rigs but these were never needed.

Chris, G0FDZ obtained a number of PCs for logging and in the weeks leading up to

the start of operation Toby, 2E0TBO was kept busy setting up the PCs and configuring *Win-Test* on all machines. A central server held pdf copies of all equipment manuals and also ran G4CLA's software to feed Win-Test QSO information to *Clublog* in real time. This enabled the online log search and also kept team members up to date with progress of the station, wherever they happened to be.

Knowing that dozens of different operators would use the station at some time during the 47 days of operation, band changing had to be as simple and foolproof as possible. HF1 and HF2 were fully automated with a change of band on the rig also changing the band in the *Win-Test* logging program, changing the Dunestar bandpass filter and selecting the correct antenna via the 6-Pak switch located outside near the base of the 40m tower. For the first week, the Acom 1000 or FL21000 amplifiers had to be manually tuned, but once Ray, G4FON brought the Newbury club's Quadra amplifiers, band selection on them was automatic as well. Tony, G0OPB spent long hours trying to make automatic band and filter selection work from the IC-756 PRO III on the WARC station HF3 but in the end settled for manual selection by means of a three-way switch. It was also necessary to tune the Alpha 89 amplifier by hand.

Dave, G4NOW made sure the local residents in the roads that bordered the site on two sides were kept informed of the plans. An open evening for local residents was arranged but in the event no-one came: they were probably just thankful that the site was not being used for ground-to-air missiles! Several sets of filters were available during the period of operation but no EMC complaints were received at all.

ANTENNAS UP. Wednesday 25 July was chosen as the opening day for both 2012L and 2012W. This was to be the day of the first Olympic event, the football in Cardiff's Millenium Stadium. Detailed plans were made to build the station on the Sunday and Monday, with the Tuesday as contingency. After much heavy rain in the preceding days and weeks, Sunday was sunny and dry. With an experienced crew of helpers, all HF and VHF antennas were assembled and mounted on the antennas by late afternoon. The last tower on site was a 60ft trailer mounted tower kindly lent by Plextek Ltd, the communications firm based near Cambridge. Having mounted the Create 40m Yagi and 10m Yagi above, it was raised to full height as the sun set on a very successful first day of set-up – the final touch was to hoist the Union Flag on this tower's halyard.

Monday was mainly spent getting everything set up inside the operating room, which was the central part of the Scout hall. This measured approx 9m by 7m and housed three HF stations, two VHF, a monitor PC and displays. Stations HF1 and HF2 were dedicated to the six traditional HF bands 10 - 160m, while HF3 operated only on the WARC bands.

PUBLIC EXHIBITION. As well as the five operational stations, a very important component of 2012L was the exhibition. Kevin, MOKSJ did a superb job pulling all this together, designing a number of posters and displays and also reviving the set of nine large displays originally put together for M2000A. Most of the display material was in a conservatory area adjacent to the main operating room.

QTH squares worked on 6m (not showing contacts with D64 and EA8).

Visitors could also view a display of basic transceivers and a model of a typical domestic set-up with a doublet antenna slung between the chimney and a tree. By flicking a switch on the front of the cabinet, the VHF Yagis mounted on the chimney could be made to rotate.

Beyond the exhibition area was the Morse room. Smudge, G3GJW and Dave, MOBGR conducted 'Learn Morse in 10 Minutes' sessions, teaching visitors to learn to send their names in Morse code on either a straight key or electronic key and paddle. Successful candidates came away with a certificate of competence.

OPERATORS. Before the move of QTH, a lot of work had been done on operator numbers and, in addition to Cray Valley members, invitations were issued to known DXpedition and contest operators in the UK to help operate the station. Operating from the Scout centre meant that operating could be around the clock; this brought a requirement for even more operators. It was a surprise that the take-up to this invitation was poor. One operator who got in touch early on in the operation was Fred, G3SVK and he did sterling service as one of the few CW ops, putting a huge number of CW QSOs into the log on 17m in particular.

As expected, pileups at the start of the operation, just when the Olympics were getting under way, were immense. The group wanted as many CVRS members as possible to take part in the operation, but some were inexperienced in handling pileups. However, as the operation progressed and the pileups subsided, a number of less experienced operators took the plunge and had a lot of fun using a station they could only dream about having at home.

OPENING MOVES. By Wednesday all was ready for the launch. The opening ceremony was to be attended by the local MP Clive Efford, the Mayor of Greenwich, Judy Smith MBE who has been active in the Eltham community for many years and always a great supporter of CVRS, plus representatives of the Royal Greenwich District Scouts and Greenwich Council. The plan was to make the inaugural contact with 2012W on 40m and for the local MP to pass a greetings message to Jane Hutt AM, the Leader of the House of the Welsh Assembly. Despite a 2-el Yagi pointed due west, nothing could be heard of their Welsh counterparts! Such are the vagaries of HF propagation. They made contact with Don, G3BJ in Shropshire, but signals were extremely weak so they moved to 80m. Here, a solid contact was possible. Don was very well positioned near to Wenlock Edge where the first Games of the modern Olympiad took place, and he was able to exchange greetings messages from close to the origin of the Games with the MP, the Mayor and with Norma Welch, who was Greenwich Council's liaison for the Games.

After the inaugural contacts with Don on 80m (and still unable to hear 2012W), 2012L let loose on the HF and VHF bands. They made 350 QSOs in the first hour and 1,000 QSOs within 2 hours 40 minutes, with the second thousand within a further three hours. The day ended with 3,300 QSOs in the log. Despite expecting 2012L would be sought after, the exceptional pileups took the team by surprise. Some serious contest operators and seasoned DXpeditioners remarked they had never experienced such pileups! One particular run on 17m SSB late into Day 2 was remarkable for the strength of the JAs and W7s who were competing with each other to make the 2012L log. On 40m SSB the pileups were huge.

Day 2 also saw the first Es opening on 6m – to Scandinavia – despite being late on in what some had thought to be a poor season. A total of over 500 QSOs in 43 DXCC countries and 176 squares were worked on 6m. The best DX was an SSB QSO with the D64K DXpedition to Comoros Island in the Indian Ocean. They also contacted 4X and

EA8. On 4m there were a few Es openings, with the best DX into ES (Estonia).

In total, 106 operators made QSOs at 2012L.

CONDITIONS. HF conditions were not terribly good for the much of the Games, but the pileups on the first few days were immense and made a nonsense of the poor conditions. After a while it was clear that the QSO total on 15m was not very satisfactory, and 12m and 10m had barely been used. Towards the middle of the operating period things improved for a while and every opportunity was taken to use 12m and 10m.

2012L seemed to generate a very high level of interest in Japan. Although conditions on the higher bands were not very good, JA signals on 17m were enormous and nearly 2,000 Japanese callsigns went into the log on that band alone. As the operation progressed, daily QSO numbers and DXCC numbers were tracked. These were marked onto a chart and proved a topic of interest to visitors.

Countries competing in the Games were also tracked as part of the Cray Valley team's 'Olympic Truce'. Although it proved hard to work many of the competing African countries, 167 countries taking part in the Games were contacted.

The antenna farm at 2012L.

VISITORS. Each day saw a mixture of UK and DX amateurs visiting 2012L. Some of the DX visitors included A71AM, NH7C, ZL1TOU, WA3QPX, AA4EH, K5PA, AD5HP, PA5LK, SP7VWC, OZ1BHI and OH1MIV. Among the UK visitors were RSGB General Manager Graham Coomber, G0NBI and numerous amateurs who were working at various Olympic London venues for Ofcom. Several radio societies also arranged visits.

PARALYMPICS. The start of the Paralympic Games saw a second launch party. Highlights were a presentation by Simon Parsons from the British Wireless for the Blind Fund and a sked with the RAIBC club station, G4IDC, followed by one-to-one QSOs between several disabled Cray Valley members and various RAIBC members. During the Paralympic Games they were delighted to welcome 100 year old Eric, G8GP.

CONCLUSIONS. The previous highest QSO total made by a special event station in the UK was the 47,791, made by the Cray Valley team at M2000A. The world record was 49,790, set by the DQ2006X team during the 2006 World Cup. Both totals were exceeded by 2012L. The team had set itself the challenging target of 60,000 QSOs. The target was reached at 2305UTC on 31 August. The team went on to make a total of 69,644 QSOs in 220 DXCC entities. Cray Valley Radio Society was honoured to provide this special event station for the London 2012 Olympic and Paralympic Games. They had a great time handing out the QSOs and hope you enjoyed it too.

Start Here

My Tesla coil project - continued

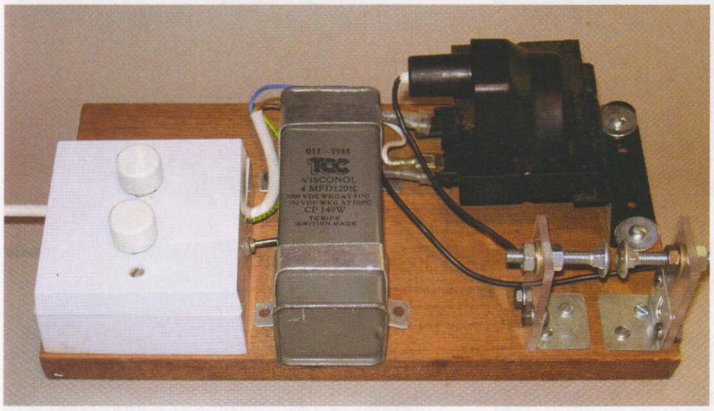

PHOTO 1: The Tesla coil system switch unit.

INTRODUCTION. Last month I described the overall system and its purpose. In this part I shall describe what I call the 'switch' or 'pulse' unit, the means of generating pulses of a few thousand volts about one hundred times per second. In the spark transmitters of the early 1900s, Marconi used either a battery powered buzzer or electric bell type mechanism or, when on board ship, the ship's alternator to supply the interrupted current to the primary of an induction coil. I experimented with both a buzzer and a 50Hz mains powered system and eventually decided to use the mains powered system in the switch unit as it generated about twice the RF power of the buzzer system. The mains isolation transformer mentioned last month provides essential isolation from the mains supply.

SAFETY FIRST. I make no apologies for repeating myself. Although the description of my Tesla coil system will be sufficient for an experienced person to construct a similar device, it is not the intention of this short series to provide full constructional details, nor to draw your attention to all possible safety hazards. I'm simply describing what I did, at my own risk. There are a number of websites dedicated to Tesla coils – I would strongly recommend that you do a lot of research before even considering building a system of your own.

THE SWITCH UNIT. This made use of a readily available light dimmer switch in a slightly novel way to supply current pulses to the primary winding of a step-up transformer. I used a car ignition coil as the step-up transformer because one was readily available and could produce the necessary high voltage (over 10kV) output. However, when I fed the ignition coil from a 12V mains transformer, the high voltage output was very weak. This was very disappointing, but I soon realised that the ignition coil required some form of 'interrupter' to start and stop the current more quickly than occurs with a 50Hz sine wave.

Instead of using an electro-mechanical system (as in a buzzer or electric bell), I experimented with a solid state TRIAC system, as used in a light dimmer switch. A TRIAC dimmer switch works by switching the mains voltage to the load at a variable point during each mains half cycle, depending on the position of the control knob. This varies the amount of energy delivered to the light bulb per half-cycle and, hence, its brightness. Switching off occurs automatically twice per cycle at the zero voltage crossover point between positive and negative half cycles. For maximum effect I reckoned I would need to switch the mains across the primary of the ignition coil (but only for a millisecond) at the peak of each half cycle. The duration of the 'on' period is effectively controlled by the time constant of a 4μF capacitor in series with the primary resistance and inductance of the car ignition coil. The result is a series of 'spikes' delivered to the primary of the ignition coil, 100 'spikes' per second. DO NOT connect a 12V ignition coil directly to a mains dimmer switch.

There is one fly in the ointment. Mains dimmer switches are designed to work with a resistive load; the variable turn-on point is obtained by turning the control knob that varies the resistor of an R-C phase shifter. In my case the load was essentially capacitive, so I didn't expect the control knob to work in the same way. I found that instead of the switch-on point for maximum sparks being at approximately the half way point of the knob's rotation (ie at the peak of the AC waveform), it was actually at near the minimum or dimmest point.

I have to admit that I blew up the first dimmer switch within a few minutes of otherwise satisfactory operation. I calculated that the dimmer switch was handling peaks of about 20A (it is probably designed for a load of a couple of hundred watts, say 1A maximum). I therefore experimented with different size capacitances in series with the primary of the ignition coil to reduce the energy in the pulses, eventually settling on 4μF. The capacitor is rated at 1000V DC – and it needs to be. I also purchased a double dimmer unit and fitted a separate switch so that I could easily switch to the second dimmer if the first failed during experimenting or demonstration. The current unit has not failed and has performed satisfactorily for several hours and for several demonstrations over the last 10 years, although I tend to only run it for about a minute at a time. **Figure 1** shows the circuit of the essential mains isolating transformer and the switch unit comprising dimmer, capacitor, step-up ignition coil transformer and safety (spark) gap. **Photo 1** shows my switch unit; the isolating transformer is not shown.

The safety gap on the switch unit (seen in the right hand bottom corner of the picture) hopefully never comes into use. It is designed to prevent the step-up transformer ever seeing an open circuit, which may lead to internal sparking and its destruction. It is set to spark over at a little more than 5kV. It also provides one with a sharp reminder that the mains is on when it is not connected to the following unit, the RF unit. When properly connected to the RF unit, that unit's own spark gap breaks down at slightly less than 5kV to generate RF pulses. Next month I will describe the RF unit and the Tesla coil itself.

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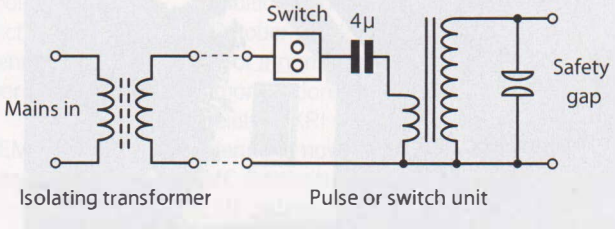


FIGURE 1: Mains isolating transformer and switch unit. See text for details of the safety gap.

EMC

Man-made noise abounds

10MHz BAND QRN. Ken, GM4JMU reports his experiences with two sources of QRN on the 10MHz amateur band. He sent a detailed report with photos, making two interesting EMC case studies that are likely to be useful to other Members who experience similar issues.

At Ken's QTH on the southern edge of the Glasgow conurbation, 10MHz had ceased to be the happy hunting ground for QRP DX because of high noise levels in the band. After some months of accepting the 'no-go' situation, Ken realised that the 'noise floor' had gone up to S9 on this band, which rendered weak signal communication impossible. It was time to find the source – and he eventually found two sources.

ADSL ROUTER QRN CURED. Ken's first step was to check whether the source was in his own household and, in the course of these tests, he found that the switch mode PSU (SMPSU) for the Thomson TG580 router for his Tesco Broadband internet service was generating 'hash' close to the 10MHz amateur band. Ken found that the 'wall wart' SMPSU supplied with the TG580 generated conducted RF emissions on the overhead telephone line that were detectable on the 10MHz amateur band. The SMPSU was marked OEM model ADS0126A-X120100, Thomson Telecom Made in China. Ken found that something in the SMPSU was 'ringing' close to 10MHz on each pulse edge of the switching frequency. He had several replacement routers and SMPSUs but they all seemed to be the same.

PHOTO 2: A short RF sampling loop in use on an overhead telephone line (NOT for use on power lines).

Tesco Broadband confirmed to Ken that the Thomson router PSU met EMC/EMI standards. I also have Tesco Broadband with a Thomson TG580 router so I did some EMC tests on the same type of SMPSU and found that while it did emit a noise peak centred at 10MHz, this appeared to be well below the EN55022 Class 'B' conducted emission limit. The SMPSU also appeared to comply with EN55022 Class 'B' at all frequencies from 150kHz – 30MHz. The fundamental switching frequency is around 66kHz and, as this is below 150kHz, it is in a frequency range that is not tested by EN55022. That doesn't mean that conducted emissions at frequencies below 150kHz can be ignored however if this SMPSU is used to power an ADSL router, this frequency range is used for ADSL, mainly for the upstream channel.

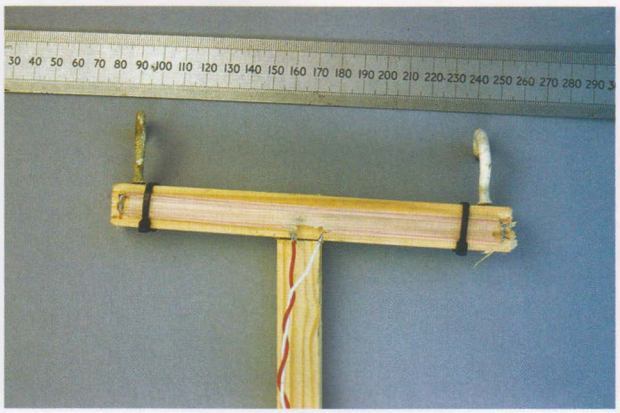


PHOTO 1: Construction of a short RF sampling loop for use on overhead telephone lines.

Ken tried winding the low voltage DC output cable of the SMPSU through a ferrite ring core. He found that 10MHz band noise from external sources was still getting onto the telephone cabling in the house, so a ferrite ring core was installed in the loft near the point where the telephone drop wire comes into the house. This cut down the RFI radiated from the telephone cables, but then Ken found a far better way of reducing the noise: don't use a switch mode power supply! He changed the SMPSU for a 12V 1A linear PSU and this made the most significant improvement. Ken also reports that with the common-mode choke and a conventional linear 12V DC PSU, his Tesco Broadband internet connection is far more stable and he no longer has to reboot the router from time to time. He rarely experiences drop-outs, but if he substitutes the original (and replacement) OEM SMPSUs, internet performance problems return.

On my Tesco Broadband service, I had complained several times about poor connection quality, high upstream error rates and the need to restart the router from time to time. Tesco Broadband had sent a replacement router with a new SMPSU but it made no difference. Then I tried Ken's tip and changed the SMPSU for a linear PSU. This was a 12V 1A unit from a surplus Netgear DG834 v2 ADSL router; it was necessary to change the DC power plug to fit the TG580 router. Thanks to Ken's tip, the quality of my Tesco Broadband ADSL connection has improved with about 10 times fewer upstream errors.

In Ken's case however, there was another significant 10MHz noise source outside the house.

TACKLING VDSL QRN. After Ken had eliminated the 10MHz noise source from the SMPSU in his own house, it was clear that there was another source nearby. A walk around the local streets with a portable SW receiver on 10MHz revealed many interference sources but a 10MHz magnetic loop helped to show that the main source at the home QTH was the overhead telephone wiring. What could it be – and which house was it coming from?

BT 'Infinity' Broadband is a 'fibre to the cabinet' (FTTC) service with optical fibre links from the telephone exchange to street cabinets. For the final few hundred metres to the customer's premises, frequencies up to 10MHz and beyond are transmitted using existing unshielded copper telephony pairs. This type of transmission is called Very High Speed Digital Subscriber Line 2 (VDSL2). If the twisted pair is unbalanced for some reason, this can cause radiated emissions but it is also likely to reduce the VDSL2 user's download and/or upload speeds. Hence if a radio amateur identifies a VDSL2

line that is radiating RF interference, this is likely to indicate a problem on the line that needs to be solved in order to provide the VDSL2 customer with the best quality of service.

On the advice of the RSGB EMC committee, Ken constructed a short sampling loop and mounted it on a long window-cleaner pole (see **Photo 1**). Coupled to an MFJ 'Cub' transceiver, the loop was able to prove that the source was a telephone wire to a neighbour over the back fence (see **Photo 2**). With the kind co-operation of that neighbour, Ken proved that the QRN only came on when the VDSL2 router was booted up but since BT advocates that the router is always connected, the QRN was continuous. Ferrite rings were used on all the router and PSU cables, but to no avail. A BT engineer investigating poor internet performance at the neighbour's premises fitted a common mode choke to the neighbour's telephone line: this eliminated the noise for GM4JMU but the neighbour's VDSL2 download speeds were not improved. For a short period, Ken could operate on 10MHz but then the choke was removed from the neighbour's VDSL2 line and the noise returned.

At this point Ofcom was called in. They supported and confirmed the investigation and characterised the noise as a broadband segment from 8.5MHz – 11.2MHz, as shown in **Photo 3**. Ken reports that Ofcom filed a complaint with BT but BT rejected this. Ofcom finally prevailed and a BT engineer was sent in to work with them on a solution. After a couple of hours of testing, the VDSL2 router was correctly impedance-terminated and the QRN from this source was eliminated. It would appear that the incorrect termination had prevented effective self-cancellation of radiation from the overhead wires and it was the VDSL2 data transmission signal on the line that was radiating, rather than any RFI from a SMPSU. Ken reports that another neighbour uses BT Infinity and no QRN has ever resulted.

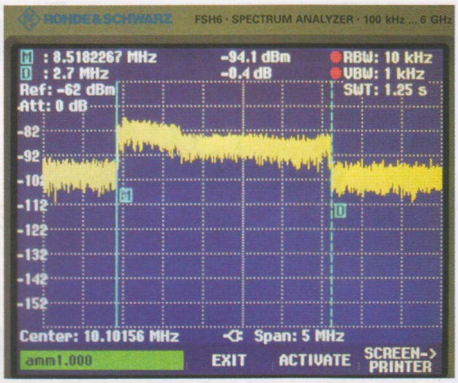


PHOTO 3: Part of the frequency spectrum used by VDSL2 transmission.

Ken reports that while a relatively high noise floor on 10MHz (S3 - S6) prevails from multiple sources and is probably not going to be resolved, at least the biggest sources have been tackled. Ken's advice is to check your own environment first, then use a sampling loop (consult the RSGB EMC committee) to narrow down the source. Then engage Ofcom when you have sufficient evidence. Ken considers that Ofcom were very helpful and supportive, particularly if you are prepared to do the basic investigation. He reports that Ofcom were impressed with the RSGB-suggested short sampling loop and this was instrumental in pointing the way to a solution.

It must be pointed out however that while the technique described here can pinpoint a source of RFI from an overhead telephone line, this should NEVER be attempted on ANY sort of overhead power cable.

HF MEASURING LOOP ANTENNAS. The October 2012 EMC column contained an item about EMC measuring antennas at VHF and UHF. Any EMC measuring antenna should have a well-defined antenna factor, ie the ratio of RF field strength to output voltage into the designed load (usually 50Ω). A half wavelength dipole has a well-defined antenna factor and it can be a useful measuring antenna at VHF/UHF. Below 30MHz however, a half wavelength dipole becomes too long for practical use as a measuring antenna, particularly in the lower part of the HF band.

In general, EMC standards specify conducted emission measurements rather than radiated measurements below 30MHz. This involves connecting the AC or DC power ports or signal ports of the Equipment Under Test (EUT) to a special network called a Line Impedance Stabilising Network (LISN) or a Coupling/Decoupling Network (CDN). This is a useful test method for many types of equipment but there are an increasing number of situations where it is becoming necessary to consider radiated emission measurements below 30MHz..

Such situations include measurement of radiated emissions below 30MHz from plasma TVs, solar PV installations, wind turbines and electric vehicles while charging. Existing HF measuring loops normally use a broadband active design with a built-in preamplifier. One disadvantage of such loops is that they result in a substantially higher measuring system noise floor compared to a half wavelength dipole for example. This may lead to the mistaken belief that HF radiated emissions of RFI for a particular piece of equipment or system at a particular distance are 'below the noise' and are therefore insignificant. The actual situation is that the emissions may be below the noise floor of the measuring system because the measuring antenna is far less sensitive than the antennas that are used by the radio services that are to be protected.

This problem can be addressed by the use of tuned loop antennas, which can provide greatly improved sensitivity. The use of high 'Q' transmitting loops for amateur radio is well known, but such loops have limited usefulness as an EMC measuring antenna because the antenna bandwidth may be too narrow compared to the measurement bandwidth and the antenna factor tends to vary significantly with frequency. A tuned loop with a moderate 'Q' factor and suitable matching arrangements can make a useful EMC measuring antenna however. The use of a tuned or resonant loop antenna as an alternative to the conventional type of broadband HF EMC measuring loop is now mentioned in the CISPR 16-1 standard, *Specification for radio disturbance and immunity measurement apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*.

I have designed such a tuned loop receiving antenna for use as an EMC measuring antenna at frequencies below 30MHz. This 600mm diameter antenna was demonstrated at the EMC UK 2012 Exhibition and Conference at Newbury on 9 October 2012 (see **Photo 4**). This was one of a number of invited practical EMC demonstrations organised by the IEEE EMC Society, UKRI Chapter. The tuned loop antenna is now being evaluated by RSGB EMC Committee for measurement of HF radiated emissions from sources such as solar PV installations. It is intended to publish further information on this in the future.

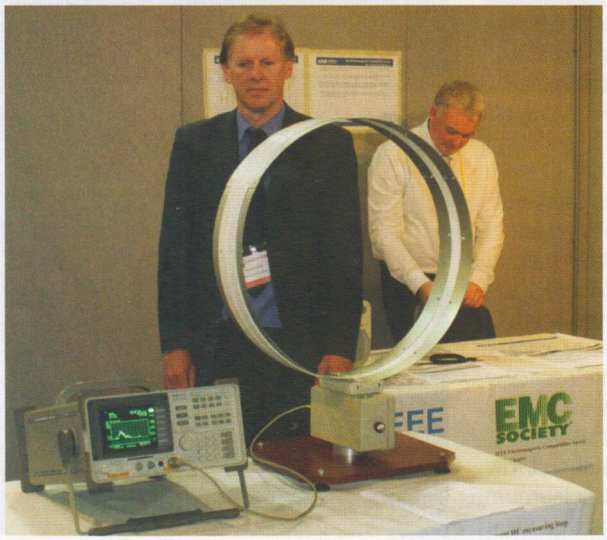


PHOTO 4: A prototype tuned loop HF measuring antenna being demonstrated by GOSNO at EMC UK 2012.

Expedition to Bressay Lighthouse and the Shetland Isles

Or… would the last one off the island please turn off the light?

Bressay Lighthouse, our home for the week.

ACTIVATING SQUARES. On Tuesday 14 August a rag-tag team of radio amateurs made up of members of the Grantham ARC and Worked All Britain enthusiasts descended on the Island of Bressay in the Shetlands. Their prime aims were to active Bressay Lighthouse in the forthcoming International Lighthouse and Lightship (ILLW) weekend and to activate islands and squares for WAB collectors. One of the team in particular was also hoping to active a few nature reserves for the World Flora and Fauna (WFF) awards scheme and the odd SOTA summit.

BASE STATIONS. Two stations were set up in the old head lighthouse keeper's cottage and accommodation was in the quite luxurious, converted assistant keepers' cottages. Following a bit of pushing, shoving and a few choice words, the stations were soon on air, courtesy of a 3 element tri-bander for HF and a 40m dipole. Other various antennas were to be played with during the following week, the favourite pastime of Pete, MOUSY, who somehow managed to negotiate the use of a lanyard from the top of the lighthouse tower.

The Grantham club opted to air their callsign, GMOGRC, on HF during the run up to ILLW and GBOBL (Bressay Lighthouse) was used on the LF bands.

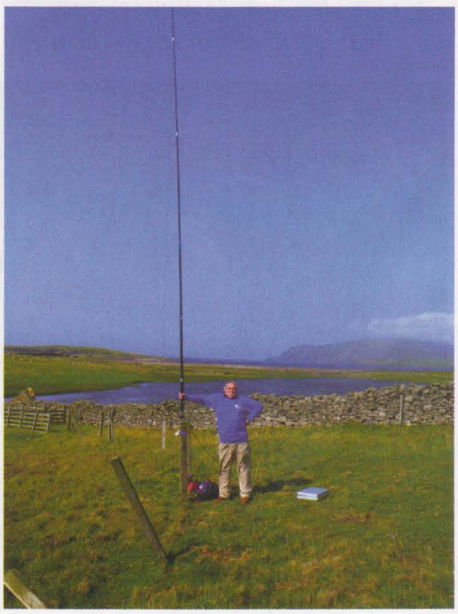
RARE SQUARES. The next day some of the group – Peter, ON2WAB, his XYL Dona, Paul, GOGMY, his XYL Di, Alec, MOPUD, Judith, G4IAQ and Dave, G4IAR set off to Tingwall airport to catch a pre-booked flight to the island of Foula, with the intention of activating the lighthouse and the rare HT WAB Large Square.

Alas it was not to be, fog was forecast and whilst the flight could get us out there, they could not guarantee getting us back. We had to settle for a picnic in the fairly rare WAB square of HU30 *in the bright sunshine!*

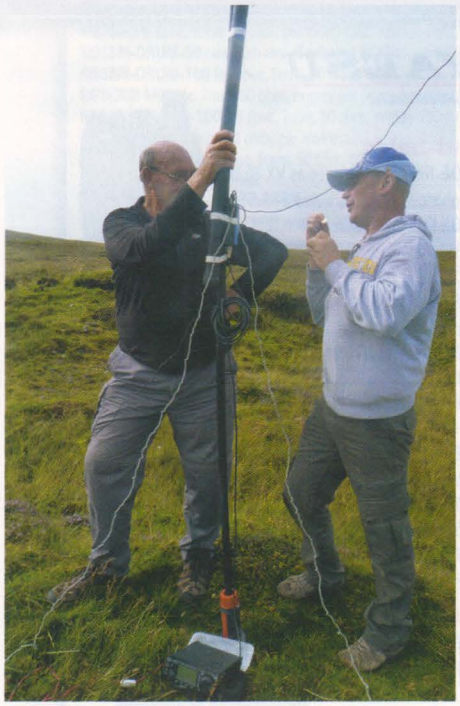
ACTIVATING OTHER ISLANDS. So as not to let the WAB collectors down, the same crew set off the next day to activate the squares on the main island of Shetland and to then catch the ferries to Yell and Unst. On this occasion, some of the party were pleased to have turned 60, as their travel on the inter-island ferries was free.

On arrival at Yell, we found that the LF band propagation was abysmal and it was necessary to erect a 40m dipole in every WAB square. The five of us that were activating WAB did get very proficient at it, however. In the meantime Peter and Dona had set off to Unst to activate the nature reserve there and we were to meet up later near to the famous bus shelter. (Google 'Unst Bus Shelter').

Whilst all this was going on the crew of Alan, GORCI, Pete, MOUSY, Arthur, MOUXX and Harry, G7DEH were bravely



Dave and his pole in HU30, the island of Little Holm in the background.



Paul, G0GMY, Peter, ON2WAB discussing the merits of erecting vertical aerials as opposed to dipoles.

The Team, L to R: Alan, G0RCI, Dave, G4IAR, Alec, M0PUD, Pete, M0USY, Judith, G4IAQ, Paul, G0AMY, Di, XYL G0AMY, Harry, G7DEH, Peter, ON2WAB, Dona, XYL ON2WAB, Arthur, M0UXX.

soldiering on from Bressay despite the poor conditions.

AN INVASION. On arrival back from Yell and Unst, we received a message from base to the effect of that they had been invaded by women! When we got back from Bressay, we found that the BYLARA contingent that were heading for Fair Isle had paid us a visit as, due to the weather, they were unable to get there. Temporary panic set in, as the thought of having to accommodate an extra 5 YLs, briefly flashed through my mind. They did leave us for the mainland, though, the majority eventually reaching Fair Isle, albeit one of them a bit poorly and all of them a bit late.

DISRUPTED TRAVEL. An attempt was made next day to get to the Isle of Noss to activate the island, nature reserve and the summit, but it was not to be as due to sea conditions the 'ferry', (a Zodiac rib), was not operating. Again we had to find some compensation for the WABers, so we activated the rarer squares on Bressay.

WORKING ILLW. The next day was ILLW itself and all stayed at base to air GB0BL on as many bands as possible. Propagation was still poor and very strange indeed. We had one period on 15m when all we could work was other UK stations, but nevertheless it was good to get something in the book.

ACTIVATING NOSS. The Sunday of the weekend saw better weather, so the wanderers amongst us set off for Noss again, leaving the stalwarts back at base.

Alec, M0PUD and Peter, ON2WAB well protected from the midges on the summit of Noss Head.

This time we were successful, G4IAQ and G4IAR activated the island for the WAB net from near to the warden's house, whilst the more intrepid ON2WAB, Dona and M0PUD set off for, and conquered, Noss Head. This in part made up for Peter's disappointment in not getting to Foula, counting for both his WFF and SOTA tally.

TIME TO GO HOME. Next day, (Monday) was taken at leisurely pace, culminating in aerials down and pack up time.

Tuesday saw us back at Lerwick where we did the 'tourist' bit of shopping, museums and boat trips.

Despite band conditions a good time was had by all, both radio wise and socially, a few new friendships being forged as we had not all met each other before.

Now – the reason for the sub-title? We learned very recently that on the day we left Bressay a *Notice to Mariners* was issued to say that around 12 September, Bressay lighthouse would be de-commissioned and the light replaced by an LED one of lesser range. Also responsibility for the light was being transferred from the Northern Lighthouse Board to the Lerwick Port Authority.

This transfer did indeed take place, hence our expedition turned out to be the final one to an active Bressay lighthouse.

Someone did turn the light off.

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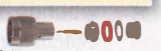

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Design Notes

Subharmonic mixers, paralleling MMICs, remote ATU tuning – and a correction

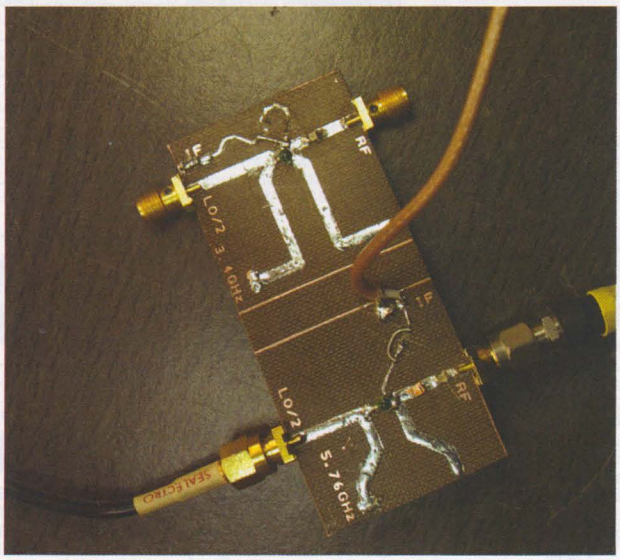


PHOTO 1: Breadboard subharmonic mixers for 3.4 and 5.76GHz. The bodged transmission lines on the IF ports were because I mistakenly made them λ/2 instead of λ/4 when laying out the PCB.

SUBHARMONIC MIXERS. At the higher microwave frequencies, where only a narrow band of frequencies needs to be covered, there is a neat and simple mixer design that can reduce local oscillator complexity – the subharmonic mixer. Using a pair of anti-parallel diodes as shown in **Figure 1**, it is a bidirectional design suited both receiving or transmitting. The local oscillator (LO) is supplied at one half of the required frequency. So for an RF signal at 10368MHz using a 144MHz intermediate frequency (IF), the LO is at (10368 – 144)/2 = 5112MHz. This frequency is easier to generate than one at 10224MHz and can be done in a single integrated synthesiser chip such as the LTC6946 [1] as used by Chris, GW4DGU, in his 10GHz transverter design. The mixer itself does the doubling in the anti-parallel pair by setting up a circulating LO current that interacts with the RF in a similar way on both halves of the drive waveform. The exact mechanism is rather more complex than just described, but it is, effectively, what happens.

This simple-looking circuit belies some fundamental microwave transmission line techniques used in its design. First, the two transmission line stubs TRL1 and TRL2 connected either side of the diode pair have the same electrical length, being λ/2, or one half an (electrical) wavelength long at the RF frequency. They will typically (although not essentially) be of the same characteristic impedance used elsewhere, normally 50Ω. Note that TRL1 is grounded at the far end, whilst TRL2 is open circuited at the far end. This is fundamental to separating the LO and RF signals.

First, consider TRL1. Being a half wave long, we know that the short circuit to ground at the far end, re-appears half a wavelength later at the connection to the left hand side of the diode pair as a short to ground. So at the RF frequency, the left hand side of the diodes is grounded. But, as the LO is supplied at half the RF frequency, this half wave long line, at LO/2, is now only a quarter wavelength, and behaves very differently. At a quarter wavelength, the short circuit at the far end appears as an open circuit (O/C) at the diodes, so it is invisible to the LO input and thus the full local oscillator signal enters the diode pair. TRL2 works the opposite way. Being open circuit at the far end, the O/C reappears half a wavelength later across the right hand end of the diodes, thus invisible to the RF input. But, for a quarter wavelength at LO/2, the open circuit becomes a short circuit and grounds this side of the diodes. We have effectively isolated the two high frequency ports from each other and managed to independently connect both RF and LO to the diode pair. Just what the mixer wants. Now we need to connect the (much lower) intermediate frequency. Theoretically, it could connect either side of the diodes, but it is easiest to use the RF side as shown.

TRL3 is a quarter wavelength (λ/4) at RF (and therefore λ/8 at the LO but that is irrelevant as the LO signal has already been suppressed by TRL2). If it were grounded at the far end it would behave in the same way as TRL2 and not affect the RF path. But we need to extract, or inject, the lower frequency IF signal. So, we add a capacitor at the far end of TRL3 with a value that has a low reactance at RF to act as a ground, but at the same time is not low enough to short out the IF. A value of 2 – 10pF is adequate for the 2.3 to 10GHz bands. TRL3 itself is made of high impedance line such as 100 – 150Ω so the resulting inductance at IF is increased and it does not significantly load the low frequency signals. TRL3 can, and sometimes is, replaced by a low value inductor. TRL3 and C in combination form a low pass filter allowing through the IF, but blocking RF and LO signals from leaking out. The IF signal path through the diodes is completed by the shorted stub on the LO side, which just appears as a short circuit at the IF.

The use of resonant lines means the technique is inherently narrowband and so it is ideally suited to our relatively narrow allocations.

Photo 1 shows a pair of breadboard subharmonic mixers built for the 3.4GHz and 5.76GHz bands. The mixers are diode pairs of a type commonly used in older satellite TV receivers and available on the surplus market. They have a common connection (the centre pin) that forms the anode of one diode and the cathode of the other. So by connecting the two outer pins together, a low inductance anti-parallel pair is formed. Both mixers measured around 12dB mixer loss, which is slightly more than should be possible with careful optimisation – but a perfectly adequate performance for such a simple design.

The mixer works at other lower even-order subharmonics too, such as LO/4 or LO/6. The loss increases appreciably, but it does ease LO drive requirements for the millimetric bands at 47GHz and higher, where getting more than a few microwatts of power is still very difficult.

PARALLEL MMICS. Colin Horrabin, G3SBI and Martein Bakker, PA3AKE have been experimenting with Monolithic Microwave Integrated Circuits (MMICs) connected in

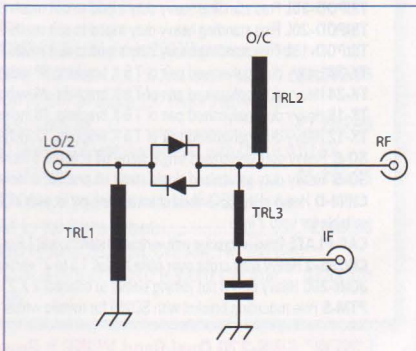
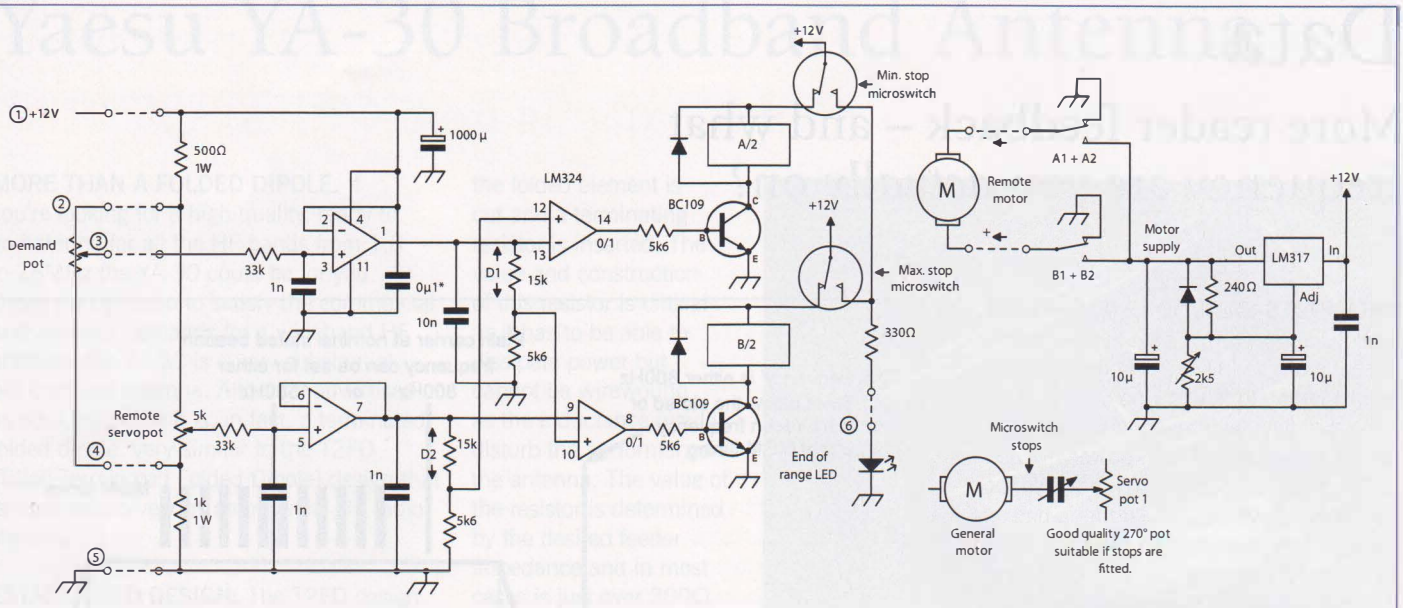


FIGURE 1: Circuit diagram of the subharmonic mixer. Standard electrical drawing practice for microwave circuitry dictates that connections shown as wires are considered to be direct and to have no physical properties that influence the circuit. If the characteristics of a piece of wire or a connectionare important, the specifics will always be shown by other means such as inductance, capacitance, resistance or as a transmission line where appropriate.



* 0 µ1 across pins 4 and 11

** Dead space can be made adjustable by fitting 50 Ω preset pots.

*** Motor speed has to be slow enough to allow the relay driving to release during the dead space or chattering will occur.

⑥ Wires for remote control when board is in remote ATU.

FIGURE 2: A simple analogue servo system suitable for remote tuning ATUs.

parallel or push pull in order to reduce the noise figure of an amplifying stage. Colin says "At the present time the 45MHz IF amplifier in the HF7070 up conversion receiver uses four J310s with source gate feedback. It has a noise figure of 1.3dB and output third order intercept (IP3) of +40dBm. The tests we have done on the PHA-1+ as a contender to replace the J310s give a noise figure of 2.6dB when it sees an 80Ω source impedance. If you connect two of these units in push pull you halve the noise figure and add 3dB to the output IP3.

"This was a well known dodge in the 1960s for making low noise preamps for the 2 and 4 metre bands using JFETs prior to the arrival of the GasFET. Martein had never heard of this before and I don't think MiniCircuits are aware of it either. Martein did a bit of maths, backed up with a practical measurement, finding that with one AD600 amplifier used in his Rx IF strip he measured an NF of 10.5dB and, with two in parallel, he measured 7.5dB.

"Taking our measured noise figure for the PHA-1 of 2.6dB, F = 1.82 so, in parallel, the resultant F is 1+(1.82 -1)/2 = 1.41, which gives a noise figure of 1.49dB.

"The point he is trying to make is that by connecting devices in parallel or push pull, NF/2 is only true for device noise figures below 3dB or so. The device we are actually going to use is the PHA-11+, a dual matched version of the PHA-1. I don't think matching is critical for our application; it's just that the package they come in is better from a PCB design point of view. MiniCircuits show an application of this device used in a push pull amplifier and mention the 3dB improvement in IP3 but say nothing about the effect on noise figure."

SIMPLE SERVO. Brian, GW3HGL sent in the simple solution to remote tuning shown in **Figure 2**. He says, "After many attempts at remote tuning ATUs without using microprocessors, this one works well. The circuit is very stable, it can be switched on and off at will without any step change. The snag in the design is that the dead space is not constant over the tuning range and resetting from clockwise or anticlockwise is out by the dead space. However, it is easy to obtain over 180 steps for a variable capacitor and, by using a ten turn pot for a variable inductor, good resolution. Mechanical end-of-range stops using micro switches is difficult, but the best solution. I have a working design using end of range potentiometers and extra components for remote inductor tuning. This works well but has a loss of range at both ends."

LF IMPEDANCE BRIDGE – CORRECTION. There was an error in the circuit diagram shown in October's issue, which was spotted by its originator, John, F5VLF, and several others. The 1µF capacitor in the known arm of the bridge was mis-labelled; it should have been 1nF. That then allows the bridge to measure reactive components equivalent to plus or minus 500pF. John also comments that he uses a Lowe HF-225 receiver as the null detector, but that it would be better if a receiver were used that allowed the AGC to be switched off.

Alan, G3NYK also adds, "...if you measure an untuned wire at LF it is usually a lot less than a quarter wave and consequently has a highly capacitive reactance. No component is therefore required in the known arm of the bridge."

Alan further added this on detectors, "... [it] MUST be a tuned detector such as a receiver with S-meter. An untuned detector will give a very flat null due to the received strength of nearby broadcast stations, particularly in Europe where there are LF as well as MF ones. The drive level to the bridge can sometime allow for this if you have a low power transmitter, but the higher power does tend to leak across the bridge and lead to hand capacitance effects too. A further complication is that the simple bridge with a single primary needs to be driven from a balanced source otherwise the differing strays to each on the two ends of the winding lead to erroneous nulls. This was the case with the much repeated design of the noise bridge with a trifilar wound transformer, but a single ended noise source. The solution was given in a 1977 *Ham Radio*, and involved using a quadrifilar winding and leaving one primary winding floating. This is described on my web site **[2]**. When carefully set up, and with the grounding done properly as John indicated, the nulls are very deep, indicating a good measurement."

WEBSEARCH

[1] 6GHz synthesiser chip – www.linear.com/product/LTC6946

[2] LF antennas and bridges – www.alan.melia.btinternet.co.uk/aelossbr.htm

Data

More reader feedback – and what frequency are you *actually* on?

DATAMODES IDEAL FOR SMALL FLATS.

David Dolling, G0FVH sent in this, which I'm including in full in the hope it might be an inspiration to others who may be forced into small flats with no opportunities for decent antennas and high power.

"In June 1997 I moved into a first floor flat. At my previous QTH I'd had a half size G5RV, a long wire, two HF verticals and a 6 element beam for 2m. I tried a small 2m beam (HB9CV) indoors but that did not work due to the amount of metal in the floors and ceilings in the block. Clearly, my new QTH was going to be a challenge.

"After being nagged by a ham friend, I began experimenting with bits of wire and, since 2004, I have had an inverted 'L' wire, going out through a vent on the spare room window, over the roof and into a tree approximately 25m away. The wire is slightly longer than 31m total but, using an MFJ-993B Intellituner, it will tune on all bands 160 – 10m; I have had contacts on all of them. After playing around on HF SSB for a while I began looking for a mode I could operate QRP and quietly, so as not to disturb the XYL or the neighbours if I couldn't sleep or just got up early. By October 2009, I was up and running on PSK, after buying an FT-897D and a SB-2000 interface. I had lots of problems getting my old PC to play ball, but a few phone calls and visits to the supplier brought success.

"I have had hundreds of PSK, RTTY, OLIVIA and FELD HELL QSOs since then, using *Ham Radio Deluxe* + DM780. Power is usually 4W, but sometimes I run QRO with as much as 10 to 15W. Best DX on PSK125 was VK3BM with 15W on 20m and, on JT65A, VK7XX with 5W on 20m. I have also worked many East coast USA stations, Brazil and UAE on 30m at 4W.

"Datamodes have really opened up the hobby for me I have been on JT65A since October 2010 and rarely use anything else. It is not a chat or ragchew mode, but my bit of wire really does put out a good signal on datamodes. I once worked in to far eastern Russia on PSK31, only to go outside and find the antenna on the ground after high winds during the night. Many stations seem to run around 30W on datamodes, but I find 10W is sometimes too much, preferring to turn the power down as low as I can.

"If you can't put up large beams or sky wires, are worried about TVI or BCI, especially if you are living in a flat, datamodes and QRP plus a loft mounted antenna might be the answer that will enable you to enjoy the hobby."

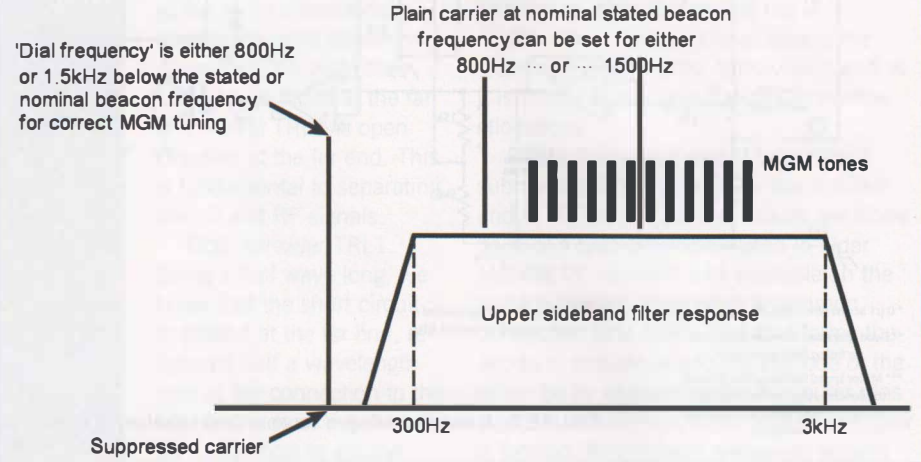


FIGURE 1: 'Dial frequency' setting and the alternative placing of a beacon's nominal carrier frequency for different resulting audio tones.

DIAL FREQUENCY AND BEACON TONES.

Weak signal datamodes such as WSJT, WSPR and Opera often require the receiver to be tuned such that the demodulated signal is fed to the decoder at, or close to, a specific tone frequency. In many cases the tone is somewhere near the middle of a typical audio SSB spectrum, ie around 1500 to 1800Hz. To assist tuning, the term 'dial frequency' is often quoted.

The term is a bit misleading as it is not the actual transmitted frequency of the signal – and it makes a big assumption. It is where the (suppressed) SSB carrier would lie, which on most modern receivers is the reading that the dial shows when tuned to UPPER SIDEBAND. USB is the only mode it can apply to: not LSB, not CW. The actual transmitted RF is higher in frequency than the dial reading by exactly the required tone. This works well if we are using a modern synthesised radio with digital readout, but older and homebrew ones with a single crystal filter can end up with uncertainties about the actual frequency being received. In these the BFO is switched either above or below the filter to reinsert the carrier; the dial reading then usually corresponds to the centre of the SSB passband.

Another problem is appearing as machine generated modes (MGM), particularly JT65, are added to beacons. JT65 is optimally tuned so its sync tone (the lowest of the 65 transmitted) is delivered to the receiver at nominally 1270Hz. All such beacons must also transmit a plain carrier and CW for the remainder of the period when the MGM is not being sent. This carrier must be placed exactly on the beacon's stated RF frequency. The beacon builder has complete freedom to place the demodulated plain carrier tone anywhere in the resulting audio band when the receiver has been correctly tuned for MGM. On GB3VHF and GB3RAL, this tone has been placed at 1500Hz for two reasons: it lies roughly in the middle of the JT65B tone spread of 1270 – 1620Hz, so the signal width is kept to a minimum. Secondly it gives an easy to remember tuning point: dial = stated frequency – 1.5kHz.

We have a problem. With the Rx set for MGM, the resulting audio at 1500Hz is uncomfortably high for most listeners, who usually want a tone in the region of 800Hz. This means the tuning has to be shifted between MGM and aural reception – hardly convenient! It would be quite feasible to place the plain RF carrier to deliver 800Hz (also an easy to remember offset), but that gives another problem. The spread of frequencies now extends from the RF carrier delivering 800Hz up to 1620Hz – a range of 820Hz, which is somewhat excessive in the tightly allocated VHF beacon band. There is no simple answer: both arguments are valid. 800Hz would be nice; 1500Hz is better from a spectrum allocation point of view.

Yaesu YA-30 Broadband Antenna

MORE THAN A FOLDED DIPOLE. If you're looking for a high quality, ready to go antenna for all the HF bands from 1.8 to 28MHz the YA-30 could be for you. Designed by Yaesu to satisfy the commercial and amateur demands for a wideband HF antenna, the YA-30 is a very substantial but compact antenna. Although advertised as a folded dipole it is, in fact, a terminated folded dipole, very similar to the T2FD (Tilted Terminated Folded Dipole) design that is used extensively by commercial HF radio stations.

ESTABLISHED DESIGN. The T2FD design first appeared back in the 1940s and, after extensive testing by the US Navy, was adopted as their primary wideband antenna. One of the main attractions of the T2FD design is its wideband performance that enables stations to operate across the entire HF spectrum with just a single antenna. Although not as efficient as an antenna designed for a specific frequency, the antenna is still one of the best compromises available for wide band operation. As such it is an excellent choice for multiband amateur radio stations where only one antenna can be installed.

This T2FD design is often described as a squashed rhombic antenna, as the rhombic antenna is its closest relative. The antenna comprises a folded element similar to a simple folded dipole but the centre of the folded element is cut and a terminating resistor is inserted. The value and construction of this resistor is critical as it has to be able to dissipate power but cannot be wirewound as the inductance would disturb the performance of the antenna. The value of the resistor is determined by the desired feeder impedance and in most cases is just over 300Ω to match a 300Ω feeder. In the case of the YA-30, the antenna is supplied with a balun to match the feed point impedance to the supplied 50Ω coaxial feeder.

SPECIFICATION. Construction of the YA-30 is very substantial. It is clearly designed for commercial as well as amateur use and, as such, it should be good for many years of service. Like all antennas, the YA-30 ideally needs to be mounted as high and as clear as possible for best performance but you will need solid supporting masts as the antenna is quite heavy. However, there is some flexibility in the installation as it can be erected in an inverted V format with just a single main supporting mast. The overall length of the YA-30 is 24.5m (80ft 5") and it is supplied with everything necessary for erection, including guy ropes. The YA-30 is rated at 150 watts from 1.9MHz to 30MHz and has a feed impedance of 50Ω. The antenna even includes 30m of 50Ω coax terminated with a PL-259 plug. The VSWR is quoted as better than 2:1 from 1.9MHz to 18MHz and better than 2.5:1 from 18MHz to 30MHz.

SPECIAL OFFER. Normally retailing at over £300, the RSGB has negotiated a special offer on this antenna, saving Members £110 on the normal price. See the advert below or the RSGB Shop for further details.

Book Review

A bumper selection this month, ranging from QRP to spies

ARRL Handbook 2013

Edited by H Ward Silver, NOAX

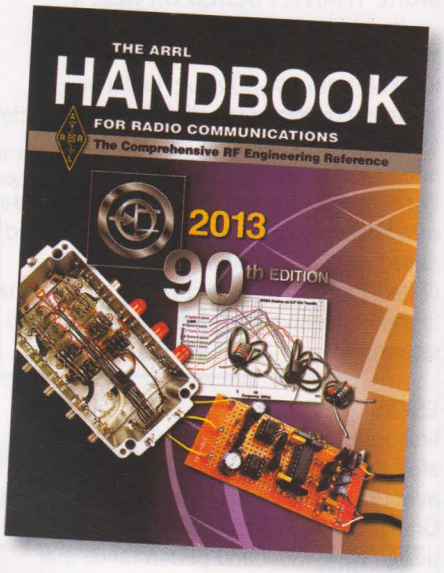
The first edition of the *ARRL Handbook* was published (as *The Radio Amateur's Handbook*) in 1926. That the 2013 version is the 90th edition means that the book has been updated slightly more than once a year ever since. And throughout that long lifetime it has unquestionably remained one of the most respected books in amateur radio.

These annual updates are done on a rolling basis, with older sections being 'freshened' and newer sections added as the amateur radio state of the art advances. I was also interested to learn that some new material has been included from RSGB sources, which is acknowledged in the Foreword.

I like the *ARRL Handbook* because it covers such a vast range. It starts by asking a pretty fundamental question – what is amateur radio? – and, after that, moves on to the fundamentals of electricity, progressing to the basics of analogue and digital circuits. It continues with detailed looks at a wide range of electronic and amateur radio subjects – the various parts of radios, aerials and propagation, equipment and techniques, to name but a few. It is impossible to summarise the 29 chapters in a few words. Even the main high level Table of Contents takes up 4 pages! Suffice it to say that the *ARRL Handbook* is both comprehensive and authoritative.

The CD-ROM that accompanies the Handbook is amazing enough by itself. It not only contains every word and picture of the book, with fully searchable text, it also contains a wide array of supplementary information. This includes three extra chapters on space, digital and image communications, copies of all QST articles that are referenced from the main text and a number of projects that have been 'retired' from the printed section. In addition there is some powerful design software that includes *ELSIE* (filter design) and *Pi-EI Circuit Design*, to name but two.

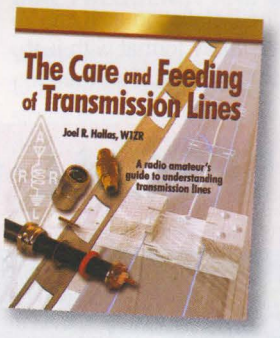
Overall, I can't recommend the *ARRL Handbook* highly enough. There are a few possible grey areas, particularly those dealing with American mains electricity, law or licensing conditions, but these are infrequent and, I thought, fairly easily spotted. If you haven't got your own *ARRL Handbook*, buy this book. If yours is more than a few years old, buy this book. I think it's worth every penny.



ISBN 9780 8725 9405 0
1320 pages, 277 x 208mm approx
Non Members' price £34.99
Members' price £29.74

The Care and Feeding of Transmission Lines

By Joel R Hallas, W1ZR



I had to read the first two sentences of this book twice. "A transmission line is a kind of cable designed to convey power between physical locations. This kind of system is used for transmission of water, gas, sewage, electrical power, telephony signals and, in our case, radio frequency (RF) energy". Thankfully, the style settles down after this point and the book starts discussing things that you really need to know.

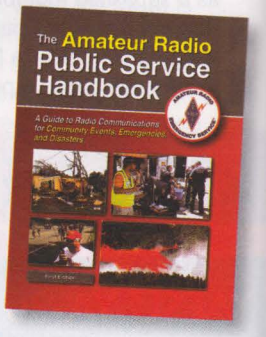
RF transmission lines come in many guises. Coax, unbalanced microstrip, balanced lines in various forms and guided wave structures (including the exotic Goubau line) are all described. Coaxial and balanced lines are, not surprisingly, explained in most detail as these are the most commonly encountered in amateur radio.

I was pleasantly surprised to find quite a lot on connectors for transmission lines, including a chapter on installing coaxial connectors on cable that covers various types of PL259, N type and BNC, among others. A novel method of attaching PL259 plugs is also described, which involves soldering the cable braid to the back edge of the plug.

Overall, I think this book gives a reasonable overview of transmission lines and their uses and would certainly be a useful reference for the relative newcomer. However, at a slender 112 pages I'm not sure that I would necessarily want to pay $27.95 plus postage for it.

ISBN 9780 8725 9478 4
112 pages, 228 x 185mm approx
Available direct from ARRL, $27.95 plus postage

The Amateur Radio Public Service Handbook



I think this is a great handbook for American amateurs involved in emergency communication activities, but quite a lot would not apply elsewhere. There are, for instance, chapters on how amateur radio interfaces with the American Red Cross, national weather services and the Military Auxiliary Radio System – all interesting reading, but not directly relevant outside that country.

On the other hand, there are some sections with wider applicability. My eye was caught by a nicely engineered and ready to run amateur station with several bands and modes that includes a portable antenna, mast, 90AH battery and 1kW portable generator, all stored ready for immediate deployment. Then I discovered that the estimated cost per kit is around $10,000 plus 50 person-hours of construction time.

This book definitely fulfils its purpose as a handbook for American amateurs and I suspect that there are many elsewhere who will find it interesting reading, if only to see how well-prepared and well-integrated American amateurs are with their professional emergency responder counterparts.

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QRP Basics

By Rev George Dobbs, G3RJV

Rev George Dobbs will be well known to QRP enthusiasts from his involvement with the G QRP Club and, of course, his popular column in *RadCom*. The first edition of *QRP Basics* was published in 2003 and this second edition has been updated to reflect the QRP scene today.

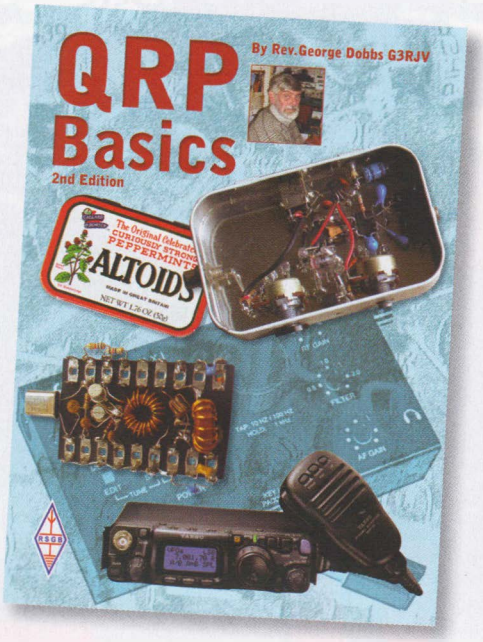
What comes across very strongly in the early parts of the book is the enthusiasm that George shares with other QRP enthusiasts for their low-power endeavours. He explains how he restarted his amateur radio career with a QRP setup and was amazed at the results he got. The first time he fired up his newly-constructed 2W ("on a good day") transceiver, with a decidedly below-par antenna, he worked Sweden with a good signal report. He was hooked.

QRP Basics is definitely a book from the heart – not only is it sprinkled with people's stories but it is clear that they put their heart into QRP, too. In fact, buried within the book is a warning: "Building a modest transmitter is a good way to try QRP operation. Many seasoned QRPers began by building a small transmitter from a kit or a circuit design. But beware! Once that first little transmitter has been built, probably in one evening with little financial outlay, it may put the commercial HF station in jeopardy. It is easy to get so involved in the satisfaction of contacting other stations on diminutive homemade transmitters that the expensive commercial transceiver may get pushed to the back of the bench to gather dust. Some radio amateurs never recover!"

Joking apart, *QRP Basics* contains pretty much everything you need to know to get going in low power amateur radio. It asks – and answers – questions like "What is QRP?", "Why QRP?" and "What can be done with QRP" in a very illuminating style. I was particularly impressed to read of the Russian DXpedition that accidentally worked its first 21 contacts on a dummy load, with an estimated antenna power of under 10mW!

There's loads of practical advice, ranging from what to pack when going QRP portable, through antennas, to advice on setting up your workshop to make your own QRP gear. To that end there are a number of practical projects including test gear, transmitters and a receiver. All seemed quite straightforward and beginner-friendly.

The great thing about QRP is that the easiest way to get into it is simply to turn down the power on your existing radio. But as this book shows, there can be a whole lot more to this fascinating part of our shared hobby. I enjoyed it; the book made me start thinking differently about my hobby. Highly recommended.



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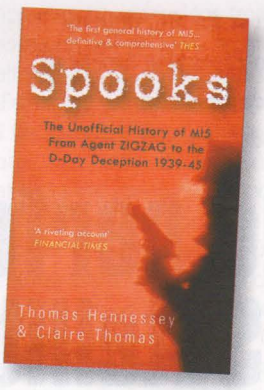
Spooks – the unofficial history of MI5

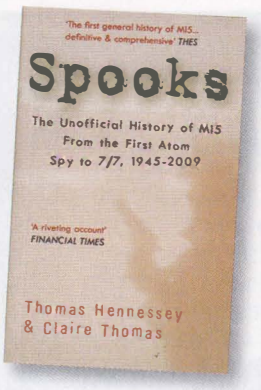
By Thomas Hennessey and Claire Thomas

I have a weakness for spy books. These two volumes tell some fascinating stories about British spying activities in World War II and from the end of the War until 2009. Interestingly, the wartime book is substantially longer than the latter volume. I presume this is because there has been much more material released regarding the War than on more recent events.

Both books come across as very well researched and sourced. They tell of fascinating plots and intrigue across the years. Some parts were familiar to me, but there was much that I had not previously encountered. I was particularly interested to read the most recent parts of the later book that deal with the events surrounding the 7/7 bombings in London – and several other events that *didn't* take place, thanks to the work of MI5.

These books are very encyclopaedic in nature, so can't be described as an easy read, but those interested in MI5 will find much of interest – including a significant discount if you buy both books together.





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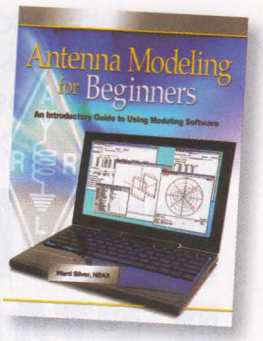
Antenna Modeling for Beginners

By Ward Silver, NØAX

The stated goal of this book is to help you take the first steps with antenna modelling software, helping you to become familiar with how a model is constructed and evaluated by the software.

Never having tried any form of antenna modelling before, I eagerly downloaded the free demo version of *EZNEC* and started following the instructions. But soon I was getting frustrated because the software wouldn't let me enter data in what seemed to be a logical sequence (left to right!) and yet, after a while, I found I could access the formerly 'locked' cells. I'm sure this was a 'feature' of the software and not the book's fault.



I looked through the rest of the book and it does hold your hand through the various steps of learning *EZNEC*. Each chapter deals with a different aspect of modelling and consists of a mix of step-by-step instructions and exercises. At the end of the book is a series of chapter-based quizzes that you can use to check your understanding, either as you complete each chapter or as an 'end of book exam'.

Whilst I still haven't been bitten by the antenna modelling bug, I do think that this is a valuable book that could give a raw beginner a very good grounding in *EZNEC* and help increase the experience of the occasional user.

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Amateur Radio Observation Service

MEETING THE PUBLIC. AROS was recently represented at the National Hamfest at the Newark showground and we believe that this was the first time since it was set up that AROS has been present at this kind of open forum. It has been lightheartedly accused, perhaps with some justification, of being the secret service of the RSGB. This may reflect the nature of the work that it does but has also meant that many amateur radio operators are unaware of its existence.

Together with Deputy Coordinator Mario Brashill, G2DPA we were pleasantly surprised at the level of interest and enthusiasm shown in AROS by those attending the Hamfest. We found ourselves talking virtually nonstop to interested operators throughout the first day and were kept very busy during the second day. We were delighted to meet David Pratt, G3KEP who was the first AROS Coordinator and wrote a *RadCom* article on the subject in 1977. In those days he was known as the 'Honorary Organiser'.

NEW OBSERVERS. As a result of the presence at the Hamfest an additional 27 radio amateurs agreed to be included in the list of Observers. The identity of the Observers is kept confidential, which may be where the 'secret service' idea came from. In total now there are 78 Observers throughout the country who are available to monitor amateur band frequencies where transmissions are obviously in breach of licensing conditions. However, the distribution of Observers is uneven so we are still keen to recruit more volunteers in London and the Home Counties.

AROS ROLE. The role of AROS is to provide an advisory service and to protect the reputation of amateur radio. To this end the Coordinator and Deputy Coordinator will accept complaints from any reasonable source where it relates to misuse by amateurs, or people pirating as amateurs, on our UK amateur bands. Complaints concerning transmissions from other radio services on our primary amateur bands are dealt with by RSGB Intruder Watch.

Following a complaint, AROS Observers will be tasked with monitoring the relevant frequencies and will collect information relating to the complaint. Modern technology makes this process very easy by the use of computer software that is VOX activated. The software will record the content of the transmission, the frequency, date and time. So there is no need for Observers to spend hours waiting by a radio for the rogue transmission to start to collect the information.

Some Observers have direction finding capability. Many Observers have good local knowledge and will have heard the examples of the bad behavior over the air before. With a little application it is not usually very difficult to identify the location and the culprit.

The AROS representatives will then contact the suspected culprit by letter informing him/her of the nature of the complaint and also that there is a file of information including recordings of the transmissions. AROS will ask them to cease the aberrant behavior. If this is done then no further action is taken and everyone can return to the joy of the hobby.

If the bad behavior continues then the monitoring by Observers will continue and the file of information is forwarded to the Ofcom Investigation Unit. Based on the information supplied, Ofcom may then mount their own investigation, collecting their own evidence to support whatever enforcement action is deemed necessary. Their sanctions include prosecution, seizing of equipment and rescinding the amateur radio licence. This means that our Observers are not involved in any enforcement process.

AROS CASES. The experience of the current AROS officers is that the nuisance transmissions tend to be caused by a few very selfish individuals who often seem attracted to 2m repeaters. They seem to believe that if they do not use a callsign or use a false callsign they will remain unknown and that is the cloak beneath which they hide. Sadly in a few cases their behavior appears to be fuelled by drunkenness or psychosis and motivated by their dislike for a fellow amateur radio operator or the world in general. Perhaps now is a good time to remind repeater keepers of their responsibilities in such cases, even if it means turning off the repeater for a time.

As radio amateurs we will make mistakes especially if we are into experimentation, which after all is what the hobby is about. As a result we may over modulate, we may be incorrectly tuned causing transmitted harmonics and we may cause interference to others. Those new to the hobby may be susceptible to even the most basic of errors. However these mistakes are not intentional or malicious and with a little guidance from other amateurs they can be corrected.

The cases dealt with by AROS this year include instances of threats and abusive behavior over repeaters and the transmission of unsuitable material by slow scan TV. The cases of the use of silent key callsigns are interesting and we even have an instance where we believe a pirated callsign is being used by a qualified amateur to enter competitions – why, you may ask?

CAN YOU HELP? There is a continuing need for more Observers to assist in the work. It may be that individually they are not called upon for years. However there are some parts of the country where Observers are scarce and where the monitoring of the bands, where appropriate, could greatly enhance the joy of the hobby by supplying information that would enable AROS to let the spoilers know they are identified. Please get in touch if you can help.

Noise power ratio (NPR) testing of HF receivers

Using notched noise to evaluate dynamic receiver performance

PHOTO 1: A typical white noise generator with filters suitable for NPR testing.

INTRODUCTION. Noise-power ratio (NPR) testing is a performance test technique in which a notched noise-band is applied to the input of the system under test (SUT). The output of the SUT is connected to a selective level meter whose bandwidth is less than that of the notch inserted into the input noise spectrum. The idle-channel noise (ICN) is measured with the noise-band (a) not notched and (b) notched. The theory behind the NPR test is that the incident noise outside the notch will provoke reciprocal mixing noise and multiple IMD products, which will appear in the idle channel (the passband of the selective level meter) and raise the ICN.

In this article, we will explore the applicability of NPR testing to the performance evaluation of HF receivers as an adjunct to the more conventional narrowband two-signal methods currently in use. The noise loading is applied at a fairly high power level and is several MHz wide; it thus simulates a heavily-occupied HF band. It is felt that this is a more 'real-world' approach to dynamic testing than a narrowband test.

When testing an HF receiver, the receiver itself serves as the selective level meter. The test requires the receiver's IF bandwidth to be no wider than the bottom of the notch; the IF filter must not be wide enough to allow noise outside the notch to spill over into the IF. The notch must be as deep as practicable to ensure that the noise loading does not degrade the receiver's noise floor (90 – 100dB stopband attenuation is typical). A bandpass filter following the noise source determines the total noise-band width.

HISTORICAL BACKGROUND. Radio amateurs who worked in the telecom industry from the 1950s to the 1980s will doubtless recall that NPR testing was used for many years to characterise multi-channel frequency-division multiplex (FDM) transmission systems (eg on coaxial cable, terrestrial microwave and satellite). A notched noise-band of equal bandwidth to the SUT baseband was applied at the transmit end and a receiver with a channel filter as wide as (or narrower than) the notch was used at the receive end to measure ICN with and without the notch inserted in the noise-band. Several pairs of transmit notch and receive channel filters were employed; their centre frequency corresponded to that of specific voice channels in the SUT.

Generally, the low end of the baseband was more subject to degradation than the high end. For this reason, the test channels were distributed across the baseband. For example, in a 960 channel system, the baseband covered 60 – 4100kHz. Typical test channels were at 70, 534, 2048 and 3886kHz. The CCITT (now ITU-T) specified NPR limits at all the test channel frequencies for the channel capacities in use in the public telecom network.

All this went by the wayside when digital (PCM) transmission systems began to supplant analogue systems in the 1970s and 1980s. Large quantities of test equipment including noise generators and receivers for NPR testing have found their way onto the surplus market. Many of the filters fitted to these instruments are on frequencies that are useful for NPR testing of LF, MF and HF radio receivers. Most of the notch filters are sufficiently narrow to allow receiver testing in SSB mode.

INTERMODULATION DISTORTION (IMD) AND NOISE IN A SUPERHET RECEIVER. Let us consider a single conversion superhet as a test model. **Figure 1** is a simplified block diagram of such a receiver. The signal path starts with an RF bandpass filter (preselector), followed by an RF preamplifier, mixer, IF filter, IF amplifier, demodulator and an audio amplifier chain. The mixer is fed by the local oscillator (LO) and, as our receiver is set up for SSB, the demodulator is a product detector (also a mixer) fed by the carrier insertion oscillator (CIO).

In our test model, the active stages are the most obvious IMD contributors. The RF preamplifier (if switched in) and the mixer will generate measurable IMD products even if only two strong signals (f_1, f_2) are present. If ($f_1 - f_2$) ≥ (IF filter bandwidth) and the signals straddle the filter passband, the filter will attenuate them to the point where they will not enter the IF chain and demodulator. If both signals fall within the filter 'window', they can cause measurable IMD in the IF amplifier and demodulator. Switching diodes in the RF signal path can also cause IMD if driven into non-linearity.

Other potential IMD sources are the quartz crystals in a crystal IF filter, magnetostrictive transducers in a mechanical IF filter, inductor cores and some capacitor dielectrics. This form of IMD is termed passive IMD; it generally occurs only in the presence of many extremely strong signals.

In addition to IMD products, reciprocal mixing noise can arise when a strong signal outside the IF filter passband mixes with LO phase noise in the mixer and the resulting noise mix falls into the IF passband.

A two-tone IMD test will provoke measurable 2nd and 3rd-order IMD. A single-tone test is sufficient to generate reciprocal mixing noise. This type of test generally does not apply sufficient power to the IF filter or to LC filter components to trigger passive IMD.

Now, if an RF noise-band (noise loading) is applied to the receiver input at a very high level (typically -4 to -10dBm), the incident power will generate a very large number of noise products due to IMD and reciprocal mixing. If the RF input power is sufficiently high, passive IMD will begin to appear. A portion of these reciprocal mixing and IMD products will appear as ICN in the notch filter stopband.

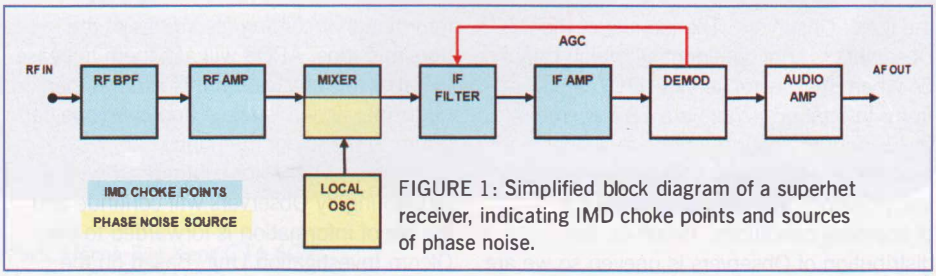

FIGURE 1: Simplified block diagram of a superhet receiver, indicating IMD choke points and sources of phase noise.

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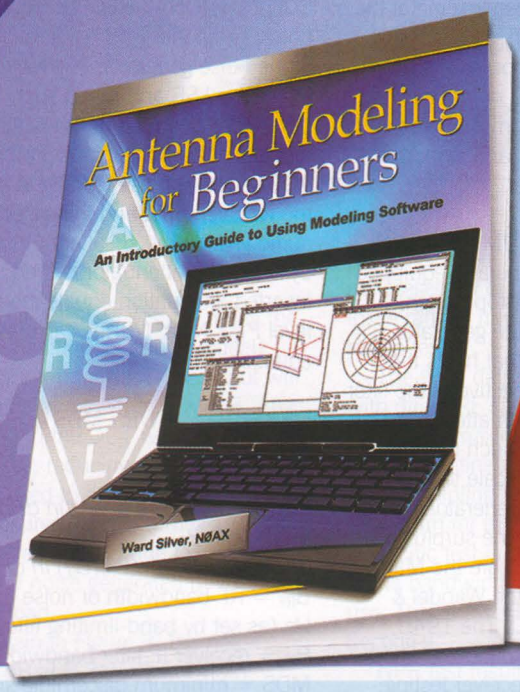

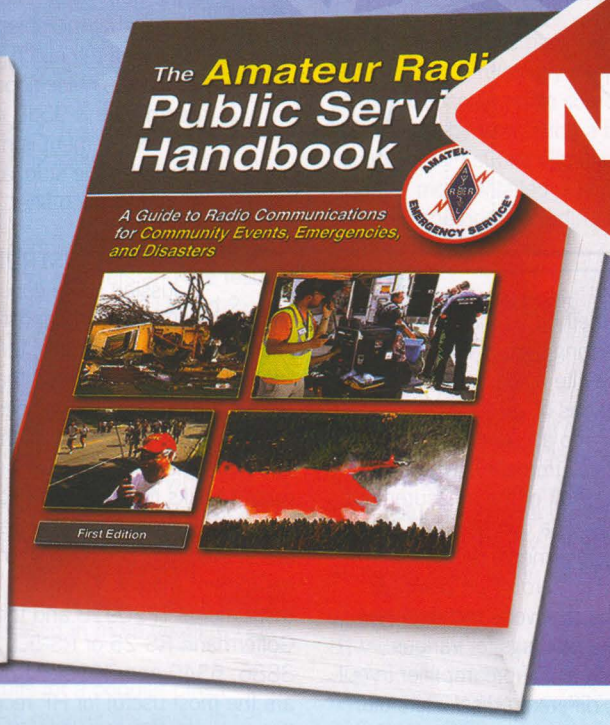

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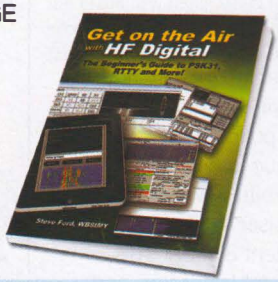

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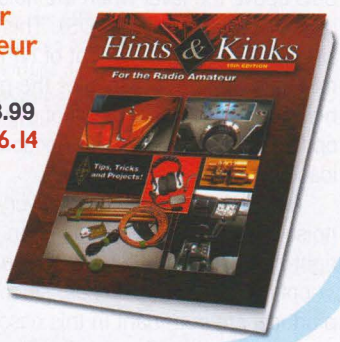

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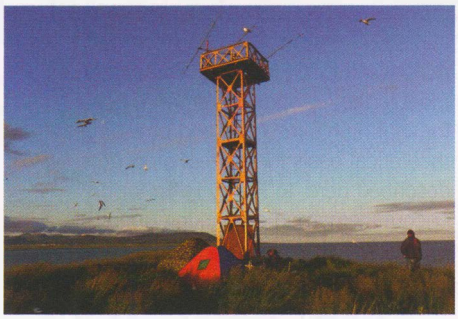
IOTA

News of the latest DXpeditions and those to look out for in the coming days



Russian Robinson QTH on Alyumka Island – with convenient tower.

NEWS OF 'NEW ONES'. Cezar, VE3LYC, Johan, PA3EXX and two operators from the Puerto Madryn club in Argentina will be heading out to the last unactivated South American IOTA group (SA-096) in early January 2013 for up to four days. This group is actually a single island called Escondida. The name means 'hidden' in Spanish and apparently was applied to the island because it is low lying and can be swamped by Atlantic waves when the weather is bad. On good days, the island is home to a variety of wildlife that creates a very pungent aroma. On balance I guess we should hope they get the better weather even if they have to wear breathing filters.

The 7Z7AB DXpedition to the previously unactivated IOTA group of AS-190 back in October was very successful and made over 20,000 QSOs from Al Dhahrah Island. The team included 10 Saudi Arabian operators led by His Highness Prince Bader Fahad, HZ1BF and was on the air from 5 to 11 October. The Saudi amateurs have now activated all their IOTA groups – though AS-111 still remains on the very rare list, with only around 5% of IOTA participants having claimed it, so let's hope a return trip is being planned.

Indonesia now has the largest number of unactivated IOTA groups with six remaining at the time of writing. News came in just after my last *RadCom* deadline of a visit to one of those six – Babar Island in OC-271 by Joppy, YB8XM and Andy, YC0MVP, who planned to be active for about one week from 1 November. Conditions to Indonesia are very good at the moment so hopefully many readers will have worked this one now. See their website at http://oc271.blogspot.jp for more information.

A new one that seems unlikely to be activated in the near future is the Senkaku group AS-194, as sovereignty is disputed by China and Japan. A diplomatic crisis is ongoing at the moment after the Japanese government purchased the islands from what it regarded as the private owners. Any DXpedition operation would be likely to trigger riots or demonstrations in both countries!

PACIFIC ACTIVITY. This seems to be the season for Pacific DXpeditioning with a number of major DXCC DXpeditions having taken place in the last few months. IOTA enthusiasts are also out in force with a number of activities due soon.

IOTA veteran Bernhard, DL2GAC (H44MS) is returning to the Solomon Islands for a DX vacation until 9 December. His main QTH will be Honiara (Guadalcanal, OC-047), but he plans "short operations" from other IOTA groups including OC-127, OC-158 and OC-168 if transportation can be arranged. QSL via his home call, direct or bureau.

On the air from Guadalcanal will be Phil, G3SWH and Jim, G3RTE who will be active as H44KW from 18 – 28 February 2013. They will operate CW only on 10 to 80m and plan to have two stations on the air for as many hours every day as possible. QSL via G3SWH, direct or bureau. OQRS for both direct and bureau cards can be found on Phil's website at www.g3swh.org.uk/h44kw.html.

The October/November IOTA expedition to Papua New Guinea planned to visit six IOTA groups. The main team included Axel, DL6KVA, Hans-Peter, HB9BXE, Eddy, K5WQG, Derek, G3KHZ and Hans, SM6CVX. QS P29NI and P29VPB via G3KHZ; QSL P29VCX via SM6CVX. See P29NI.yolasite.com for more information.

Frank, HB9BXU and other operators from Switzerland will be active holiday style as E51C, E51ABS, E51BZD and E51CHX from Aitutaki (OC-083), South Cook Islands on 12 to 30 November. Look for them on SSB, CW and PSK31. QSL via HB9BXU.

JD1YAA is the Japan Meteorological Agency club station located on Minami Torishima (OC-073). The operator is expected to be there for two months. Activity has been reported around 21.230 and 21.240MHz.

JD1BLY on Ogasawara with JI5RPT operating will be active from Chichijima Island, AS-031, 10 to 40m and satellite, CW, SSB and digital modes from 10 to 13 December. Makoto will have a log search on his website, www.ji5rpt.com/jd1/ and will also use Twitter to give real-time updates on his activities, http://twitter.com/jd1bly. QSL to his home call, JI5RPT.

RW3RN on the summit of Ratmanova Island, with the US territory of Little Diomede in the background.

OTHER REGIONS. LU3XEM, LU3XEI, LU5VAT and LU7DSY planned to be active as LT0X from Isla Pinguino (SA-087) early November. QSL direct to LU7DSY.

Nigel, VK6NI, Steve, VK2SJK, Reinhard, DF4TD and Wally, VK6YS also planned be active as VK6WDI from Woody Island (OC-170) in early November. QSLs are via VK6YS, though it seems they want direct cards only. Further information and a logsearch can be found at www.westozdx.net/IOTAS/OC170/OC170.html.

Eric, F6ICX will be active as 5R8IC from Sainte-Marie Island (AF-090) from 10 November to 9 December. He will operate mainly CW, with some RTTY, PSK63 and SSB, on 10 to 40 metres. QSL via home call, direct or bureau.

Photos of the Russian Robinson visit to Ratmanova Island have now come in and show just how remarkably close the Russian island is to the US territory of Little Diomede.

ANNUAL UPDATE. Finally a reminder to send in an update for the Honour Roll and other annual listings on or before 31 January. Listing in the 2013 tables will be restricted to those participants who have updated their scores since February 2008. IOTA rules limit inclusion in the listings to those participants who have updated their scores at least once in the preceding five years and have opted to have their scores published. The UK checkpoint addresses are at www.rsgbiota.org/info/directory/contacts-en.pdf. As the automated telephone operator says, your call is important to us. We want to keep you listed.

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Price TBA

Yaesu VX8DE
Triple Band 6/2/70 with enhanced APRS. **£379.95**

Yaesu VX-8GE
Identical to VX-8DE but 2/70 only, fitted but APRS & GPS as standard. **£349.95**

Yaesu VX-3E
Micro Handie 2/70 with scanner
£169.95

IF-2000
IF Interface board for the FT2k & FT-950
£219.95

Yaesu VX-7R
Black or silver triple band handie
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Yaesu FT-270E
2M 5W Handie
£109.95

Yaesu FT-1900
Rugged 50W 2m FM
£129.95

Yaesu FT-2900
2m 75W, MiL spec, high performance
£149.95

Yaesu VX-6E
2/70 handie **£259.95**

Yaesu FT-60E
Twin band handie
£179.95

Yaesu FT-817ND
All Band All Mode Portable Transceiver
£534.95

Yaesu FTM-10R
Compact 2/70- Mobile
£325.95

Yaesu FT-7900
Budget Twin Band 2/70 Mobile **£239.95**

Yaesu FT-8800
Receive on 2m & 70cm simultaneously
£349.95

Yaesu FT-8900
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!
£389.95

Yaesu VR-160
Miniature communications receiver **£199.95**

Yaesu FTM-350AE
NEW VERSION!
Dual-Band APRS Mobile FM with Latest firmware & bundled with FGPS-1 GPS Module.
£629.95

Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W)
Only £26.16p/m!
£79.95 deposit 36 x £26.16 or with AT-897Plus Auto ATU £949.95

Yaesu VR-120D
100kHz - 1300MHz FM/WFM/A **£139.95**

QUADRA (VL-1000)
1kW HF/6m Linear Amplifier with PSU & Auto-ATU
Only £159.25p/m!
£490 deposit 36 x £159.25

DMU-2000
Data management unit for the FT-2000/ FT-950 **£1099.95**

MD-200a8x
Elite Deluxe base Station Microphone
£229.95

MD-100a8x
Base Station Microphone **£139.95**

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ICOM

Full Icom range always in stock!

New Icom IC-7100

Who wants one of these little beauties in their shack? I do! Just check this one part of the specification: 70MHz as STANDARD! At last, a Japanese manufacturer that realises how important the 4m band is to the UK. Full TOUCH SCREEN remote controller, D-Star, All Mode, 160--70cm (including 4m!)

See web for more details.

The New Icom IC-9100

HF through to 23cms Base Transceiver

Or Plus 4 Pack only £3875*
Options:
UX-9100 23cm Module.....£623.99
UT-121 D-Star Board.....£180.00
FL-430 6kHz Roofing Filter.....£60.00
FL-431 3kHz Roofing Filter.....£60.00
*Plus 4 Pack includes all of the above.

ML&S Price: £2899.95 or £250 deposit & 36 payments of £95.69p/m
Available ex-stock

Hot Offer! IC-7000 + LDG Z-100Plus

What a perfect pair!

An HF-70cm Transceiver with the superb Z-100Plus Auto ATU.

Only £1179.95 Whilst stocks last
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Icom HF Products

IC-718	£Call
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IC-7600	£3279.95
IC-7800	£Call!
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IC-E90	£239.95
IC-E90/4m	£299.95
IC-E92ED	£388.95
IC-E2820	£485.95
IC-E2820 +UT-123	£699.95

Icom RC-28 Remote IP Controller

The RC-28 utilises the same tuning knob and encoder used on Icom HF radios, (identical to the IC-7000) providing a tactile option for the bundled RS-BA1 IP control software. The table top controller includes a sturdy PTT and two user-programmable function keys. The RC-28 is not a standalone control for Icom radios and may only be used with the RS-BA1 software.

RRP £279.95 **ML&S: RC-28 Controller Only £199.95 RC-28 & RS-BA1 (Package) £249.95**

Icom IC-7410

100W HF+50MHz base station transceiver

All mode
(AM / FM / SSB / CW / RTTY)

RRP £1999
ML&S Only £1599
with FREE SM-27 Desk Mic!
or £160 deposit & 36 payments of only £52.27p/m

Mid-range high-performance transceiver specialising in HF and six metre operation. With its increased screen size over the IC 7400, RTTY receive built in, full USB connectivity (including modulation input audio output and CIV command) topped off with a +30 DBM third order intercept point.

Icom SM-27 Mic
Nice compact & lightweight Desk Microphone from Icom. Fitted with 8-pin plug but easily adapter to RJ-45 via Optional OPC-589.
RRP £96.00 ML&S Only £79.95

Icom SM-30 Mic
Ideal for HF DX communications, this new Goose-Neck design from Icom is a modern take on the SM-5 & 6 of the late 70's & 80's. Nice small footprint with adjustable mic audio output.
RRP £132.00 ML&S Only £119.95

Icom SP-34 Desk Speaker
A matching large Base Speaker for the IC-7800 & 7700 transceivers. 120mm cone size, dual input & front headphone socket.
RRP £294.00 ML&S £239.95

Icom PS-85
20Amps matching PSU for Icom HF Base/Mobile transceivers.
RRP £379.95 ML&S Only £189.95. 3 Only!

Icom IC-7600

This Mid-range HF base station from Icom has arguably the best screen for user interface in the business.
ML&S Only £3279.95 or £280 deposit & 36 payments of only £108.33p/m

ICOM **IC-R2500**

Reviewed in RadioUser August 2012

The IC-R2500 has dualwatch receive capability, allowing you to receive two bands simultaneously. It covers 0.01-3299.999MHz in AM, FM, WFM, SSB, CW and DV modes on main band, while the sub-band covers 50-1300MHz in AM, FM and WFM modes.

Dualwatch, Digital Mode, Diversity Receiver with Remote Head Included

Available only from ML&S at £639.95 or with DSP only £709.95

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Alpin HF Linear Amplifiers

NEW

Very special prices for two very special amplifiers from Alpin!

Alpin 100Mk111
HF+6m Linear Amplifier 1kW+ PEP output
RRP £2299.95 **ML&S Price Only £2195.95**

Alpin 200
HF Linear Amplifier 2kW PEP Output from 2 x 4CX800A's.
RRP £3499.95 **ML&S Price Only £2999.95**

RF Concepts Alpha Linear Amplifiers

It's the Ultimate Manual Tune Amplifier. If you're a contester, you have a favourite band you operate on, or you like the flexibility that comes with a powerful, manual tune amplifier, the Alpha 8410 amplifier is the one for you.

ML&S - Factory appointed distributor for the Alpha HF Linear Amplifier range.

Alpha 9500. Fully Automatic 1500 Watts output HF Amplifier £6299.95
Alpha 8410. Manual Tune 1500 Watts output HF Amplifier ..... RRP £4499.95 ML&S £3999.95

MFJ Products

Lots more MFJ stocked! See web for details

MFJ-974HB	Manual ATU for balanced line antennas, 160-10m	£194.95
MFJ-974	as above but without 160m	Special! £179.95
MFJ-16010	Random Wire ATU 160-10M	£69.95
MFJ-949E	Manual ATU metered, Dummy Load, 1.8-30MHz, 300W	£169.95
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

New! BlueCAT Repeater Controller

Want to control your Yaesu FT-817, FT-857 or FT-897 via your Android phone for repeater use via Bluetooth? The remarkable tiny interface designed and built in the UK by Z2BM is available at an intro price of only **£49.99 inc VAT.** See our website for more details.

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Perfect for checking antennas and RF circuits for hams and commercial users.

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£249.95

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MiniVNA Extender
For Pro only, extends range to 1500MHz **£289.95**

MyDEL

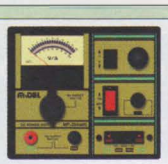
The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8 Volts at up to 120 Amps.

New! MyDEL MP-30SW1V
£89.95

Updated version of the best selling SW30111.
Digital Display, 25Amps
Like its predecessor, the new MP-SW301V is packed into the same small light weight enclosure but has two new important upgrades. Large clear LCD Display showing you Volts & Amps simultaneously. Two further 6A output terminals on the front in addition to the meaty 25A binding post terminals at the rear of the chassis. Noise off-set control is standard, variable Voltage from 9-15V DC with 13.8V set at centre position. Voltage regulation <2%, short circuit proof & auto current limiting to 30Amps.

NEW!
MyDEL MP-50SW111
50Amp DC power supply. **£149.94**

Probably one of the lightest 50Amp DC power supplies available today, the new MP-50SW111 weighs in at only 2.2Kilos (4.85lbs). Unbelievably compact measuring a mere 940mm wide including chunky rear terminals and front panel knobs and only 90mm high.



New! MyDEL MP-304Mk11
New addition to the MyDEL range of PSU's. Heavy Duty LINEAR 30Amp
For those of you that prefer old style non-switching technology in your power supply we think this new 30 Amper from MyDEL is the one. Switchable Volts/Amps with large precise metering (analogue of course!) variable Voltage, Cigar socket output for all your accessories, twin front panel outlets for up to 6Amps and two large binding post terminals for up to 30Amps. Remember, all MyDEL PSU's come with a two year no quibble guarantee. **£99.95**

MyDEL MP-925
Linear PSU
£99.95

MyDEL MP-8230

13.8V DC, 25A power supply, switch mode.
£69.95

Two-year warranty on all MyDEL PSUs

Yaesu FP-1030A

25-30Amp 13.8V fixed DC PSU, Twin meters, near silent running.
£189.95

MyDEL MP-9626
120A, 13.8V DC power supply, switch mode.
~~£399.95~~ **Now £369.95/** November/ December only.

Ideal for FT-817ND or most handhelds.

MyDEL MP-6A
13.8V DC, 6A power supply. **£29.95**

Tigertronics SL-USB

ALL sound card Digital and voice modes are supported by the SignaLink™ 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.

Call to discuss your rig-to-cable requirements.

CG MyDEL SB-2000

Self contained Radio Data interface with CAT/CIV interface built in. Once connected and configured you have Computer Control via USB and decoding via your soundcard using HamRadio Deluxe or other packages.

RTRP £99.95 **ML&S Price only £69.95**
plus leads. See web for full details.

Palstar

AT-2KD
The AT-1500DT and the AT-1KP have been combined into a new 2kW Tuner. **£449.95**

"Hello from GA. I picked up an AT2KD last Thursday. Hooked it up on Thursday night and it's the best antenna tuner I have ever used. Bought an MFJ 986 about a year ago and had to send it back 3 times for service. Have owned others over the years as I've been a ham for 51 years. Wish I had bought a Palstar sooner!!! It works great. Thanks and 73, Louis Hernandez, N4MWR-Augusta, GA.

HF-Auto
Hams have enjoyed the benefits of low power auto-tuners for years, but now Palstar takes it to the next level and offers auto-tuning with a power rating of 1 Watt to 1500 Watts. Palstar have reinvented the auto-tuner with continuously variable components for a perfect match every time, and capped it off with a power rating of 1 to 1500 watts. £1399.95

HF-Auto	1.5kW fully automatic ATU for QRO	£1399.95
AT-500	600W PEP Antenna Tuner	£409.95
AT-1500DT	1500W Differential Antenna Tuner	£449.95
AT-2K	2000W Antenna Tuner	£479.95
AT-4K	2.5kW Antenna Tuner	£789.95
AT-5K	3.5kW Antenna Tuner	£999.95
BT-1500A	Balanced Antenna Tuner	£599.94
PM-2000AM	Power/SWR Meter	£159.95
RA-30A	At last! Back in stock in the UK. An easy to use no frills High Performance SW receiver	£699.95

Palstar Dummy Loads DL-1500 (1.5KW) £119.95 DL-2K (2kW) £259.95 DL-5K (5kW) £379.95

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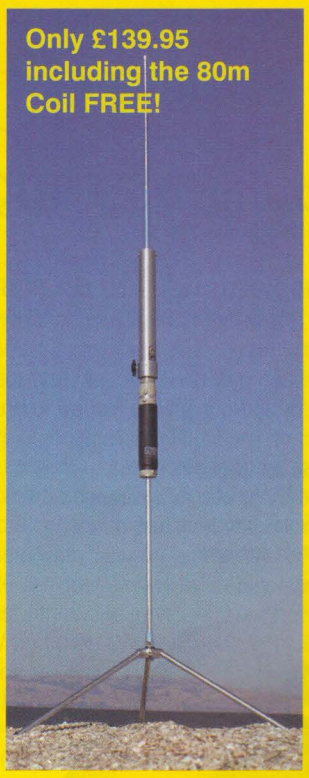


Only £139.95 including the 80m Coil FREE!

New Super Antenna MP1 SuperStick

What have You worked with your SuperStick? Go to www.hamradio.co.uk/superantenna & post your review & countries worked!

The New MP1 SuperStick is the latest design from the inventor Vern Wright W6MMA.

Covering a massive 80m right through to 450MHz*, this simple to erect compact vertical antenna weighs only 1kG, is only 2.1 m tall when fully extended and collapses down to just 30.5cm (12")!
*With optional 80 & 60m coils

Product features:
- Ham bands: 40m-30m-20m-17m-15m-12m-10m-6m-4m-2m-70cm
- Frequency Range: HF 7MHz~30MHz continuous
- Frequency Range: VHF 48 to 144MHz continuous
- SWR: 1.5 : 1 or better
- Rated Power: 500W SSB; 300W CW / DIGITAL
- Antenna Weight: < 2 pounds (1kg)
- Also configurable for up to 450MHz
- Standard 3/8"-24 male thread for mounting
- Low profile TM1 tripod included
- MC80 80m coil included for 80m band
- Optional MR series radial sets available
- Optional MC60 60m coil for 60m band

For the complete range of Super Antenna products see www.HamRadio.co.uk/Superantenna

LDG

Factory appointed distributor with the largest stock of LDG outside the US.

NEW AT-1000proII Shown with optional M-1000.

LDG Auto Tuner Range

NEW AT-1000proII.....1kw Flagship Auto ATU. Separate external head-up large format meter £469.95

M-1000	Large Analogue meter for the new AT-1000ProII	£119.95
YT-450	Auto Tuner for the FT-450 & FT-950	£224.63
YT-847	Want a really good Auto ATU for your FT-847? Here it is!	£224.63
AT-600pro	600W Auto ATU	£299.95
AT-200proII	Designed for new generation of rigs	£209.95
AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ω	£499.95
AT-897Plus	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!	£179.95
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	£177.65
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£119.95
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£134.95
Z-11ProII	Portable compact & tunes 100mW to 125W	£159.95
RCA-14	4-way DC Breakout Box	£52.12
KT-100	Dedicated tuner for Kenwood radios	£173.57
RBA-1:1	Probably the best 1:1 balun out there	£35.69
RBA 4:1	Probably the best 4:1 balun out there	£35.69
FT-Meter	Neat Analogue back-lit Meter for FT-897/857. S-meter, TX Pwr, ALC Etc	£44.95
FTL- Meter	Jumbo version of the famous FT-Meter	£79.95

2 Year factory backed warranty

Miracle Antenna

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 **£129.95**

Hustler Antennas

HUSTLER

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

4-BTV	40/20/15/10m	£183.78
5-BTV	80/40/20/15/10m	£224.63
6-BTV	80/40/30/20/15/10m	£265.48

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.

The UK's favourite rig-mounted antenna system

Wonder Wand Antennas U.K.

NEW! WonderWand Widebander
1.8-460MHz with Monster 1.8M Whip! £129.95
NEW! WonderWand Mk4
7-432MHz antenna with 1.8m Whip..... £89.95
Wonder-TCP
40-10m Tuneable Counterpoise..... £59.95

DIAMOND

Huge selection of Diamond products always available

Base Antennas
NEW! CP-VU8 80m-70cm 200W Compact HF Base, only 2.7m Long! **£469.95**
X-30 2/70, 3/5.5dB, 1.3m Long .. RRP £79.95 **SPECIAL £59.95**
X-50N 2/70, 4.5/7.2dB, 1.7m Long RRP £72.95 **SPECIAL £64.95**
X-300N 2/70, 6.5/9dB, 3.1m Long RRP £146.95 **SPECIAL £109.95**
VX-1000 6/2/70 2.15/6.2/8.4DB 1.42M Long ..... RRP £149.95 **SPECIAL £99.95**
X-510N 2/70 Fibre glass 8.3/11.7dB gain. 5.2m long "N" ..... RRP £154.95 **SPECIAL £129.95**
V-2000 6/2/70, 2.15/6.2/8.4dB, 2.5m Long ..... RRP £149.95 **SPECIAL £109.95**

Mobile Antennas
NR-770R 100W, 2/70, 3/5.5dB, .98m Long..... RRP £34.95
NR-770RSP as NR-770 but spring loaded..... RRP £39.95
NR-770RSP As above but spring loaded ..... RRP £37.95
NR-7900 2/70, 3.2/6.4dB, 1.46m Long ..... RRP £54.95

Duplexers/Triplexers
MX-72N 1.6-150/400-460MHz Duplexer ..... RRP £44.95
MX-62M 1.6-56/140-470MHz Duplexer ..... RRP £69.95
MX-610 HF/6+2+70 (for FT-8900)..... RRP £59.95
MX-2000 6/2/70 Triplexer ..... RRP £91.95
MX-3000N 2/70/23 Triplexer ..... RRP £86.95

Switches
CX-210A 2-way, SO-239 Die Cast..... RRP £53.95
CX-210N 2-way, N-Type, Die Cast ..... RRP £82.95
CX-310A 3-way, SO-239, Die Cast..... RRP £89.95
CX-310N 3-way, N-Type, Die Cast ..... RRP £114.95

SWR/PWR Meters
SX-100 1.6-60 MHz, 30W-300W-3KW..... RRP £144.95
SX-200 1.8-200 MHz, 5-20-200 Watts..... RRP £98.95
SX-1100 NEW MODEL 1.8-1300 MHZ, 5-20-200W PL-259/"N" (was SX-1000) ..... RRP £249.95
SX-1000 1.8-1300 MHz, 5-20-200 Watts..... RRP £230.87
SX-40C 144-470MHz X needle Mobile Meter ..... RRP £104.95
SX-20C 3.5-150MHz X needle Mobile Meter ..... RRP £98.95
SX-240C NEW MODEL 1.8-54MHz & 144-470MHz X needle 30W/300W/3KW (HF only) ..... RRP £339.95
SX-27P COMPACT 144/430, 60W Portable Meter .. RRP £45.93

MyDEL MyDEL CG-3000

Price: £249.95
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: 310mm X 240mm X 72mm (L - W - H)

MyDEL CG-3000/5000 Remote Control Unit
The remote control unit for the CG-3000 automatic tuner offers the features to switch the power supply for the tuner, start a rest and show the current status ('tuned'). comes with 15m 3-wire control cable and 2m DC cable. Weight 750g.
Price: £41.69

MyDEL Surmen Antenna

NEW at ML&S

SU/Z300S	VHF/UHF antenna Gain: 2.15/3.8dB 150w H:0.32m	£16.95
SU/Z209A	VHF/UHF antenna Gain:3/5.5dB H:1.07m -fiber glass	£26.95
SU/Z207B	VHF/UHF Mob. Antenna 4/6dB- 100w 1.23m with Radial	£29.95
SU/UT106-SMA-MALE	VHF/UHF MINI MAG MOUNT - 35CM 4M CABLE Male SMA	£12.95
SU/UT106-SMA-FEMALE	VHF/UHF MINI MAG -35CM 4M CABLE SMA (Ideal Wouxun)	£12.95
SU/SC-ECH	5m cable for mobile mounts - rg58	£14.95
SU/SC-5MS	5m cable for mobile mounts with35cm pig tail SO/PL	£19.95
SU/SBB4	VHF/UHF antenna- Gain: 3/5.5dB - 60Wmax - H: 0.92m	£29.95
SU/NL-770R	VHF/UHF antenna- Gain: 3/5.5dB - 150W - H:0.99m	£19.95
SU/K808	Ultra thin mag mount - 120mm base - 4m of rg188	£29.95
SU/K706	Mag Mount 120mm base - 4m RG316 (THIN CABLE) to PL	£24.95
SU/K505	STRONG MAG MOUNT - 120MM WITH 4M OF RG58	£24.95
SU/K303B	ANGLED MAG MOUNT WITH 4M OF RG-188 THIN CABLE PL	£24.95
SU/UT106-SMA-female	2/70 MiniMag 2m/70cm V+U Mini-Mag with replaceable whip, 35cm with 4m cable terminated with reverse SMA female plug. Ideal for Wouxun range of handies	£12.95
SU/UT106-SMA-male	2/70 MiniMag 2m/70cm V+U Mini-Mag with replaceable whip, 35cm with 4m cable terminated with reverse SMA female plug. Ideal for Wouxun range of handies	£12.95

DXE-UT-8213 Coax Cable Stripper ONLY £47.99!

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).

TYT TH-UVF9

A natty dual receiver 2/70 handheld with impressive performance

INTRODUCTION. TYT is one of those Far Eastern brand names that suddenly appeared on the amateur radio scene a little while ago, offering quite reasonable handhelds at very reasonable prices. The TH-UVF9 is the latest from the TYT stable; I found it quite impressive.

WHAT'S IN THE BOX? The radio arrived packaged a bit like a mobile phone, in a two layer presentation-style box. The top layer contained the radio and 7.4V 1600mAh Li-ion battery pack. On the lower layer were the flexible antenna, belt clip, wrist strap, UK style mains charger and cigarette lighter charger – the latter a very welcome inclusion. A 72 page English language user manual completed the package.

IN USE. The battery pack slides easily onto the back of the radio with a very positive click. It seems very secure, yet it is easily removed at the push of a button. One really neat feature is that the charger plugs into the battery, not the radio. This means that you can swap a flat battery for a charged spare, recharging the spent one without tying up the radio. The supplied 150mm (6") antenna connects via a standard SMA fitting, which I think is much nicer than the reverse SMA connector. The bottom, thicker half of the antenna is not flexible. There are speaker (2.5mm) and mic (3.5mm) sockets on the right side of the radio, which can also be used with an inexpensive optional cable to program the radio's 256 memories.

As soon as I switched the radio on I was impressed by the clarity of the dot matrix display. It was readable from complete darkness to direct sunlight. The backlight is switchable to three levels via a menu option, but this is irrelevant in bright conditions.

My next port of call was the manual, which seemed to cover everything. I didn't find the manual particularly easy to use, but I'm like that with all radio manuals. As supplied, the radio was pre-programmed with a number of repeater memory channels so, once I had sorted out how to set up CTCSS and narrow/wide deviation, I could test it out on a repeater. When on the air the reports said the audio sounded good; the receive audio was fine.

The built-in broadcast FM radio (76 – 108MHz) seemed quite sensitive, although the audio was quite trebly from the speaker. It is possible to receive on 2m and 70cm simultaneously, but not possible to monitor an amateur band whilst using the FM radio.

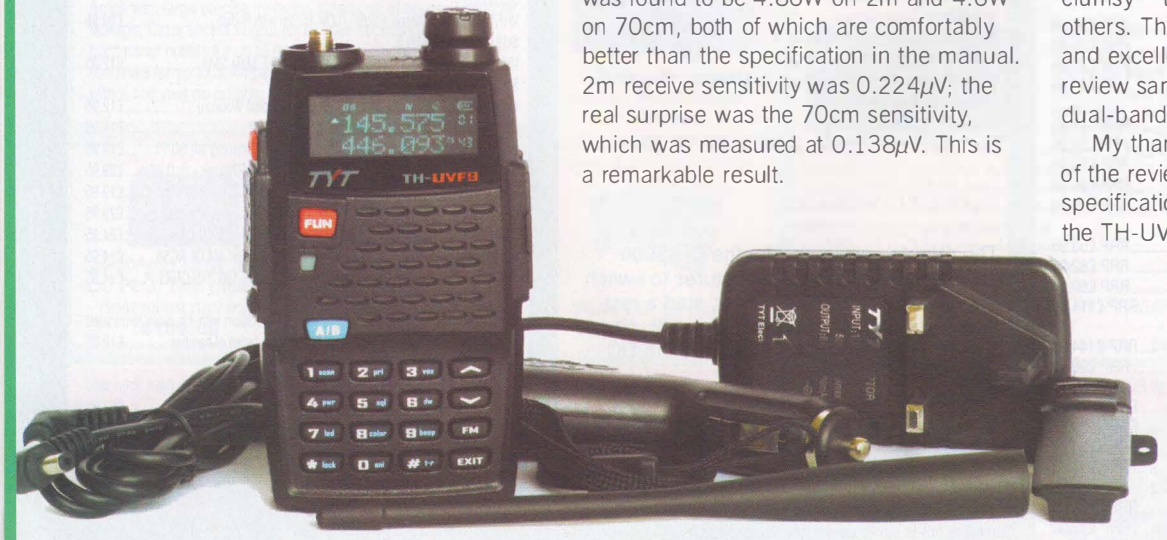
The buttons on the keypad are quite small but have a good 'feel'. The PTT is nice and positive. The radio felt good in my hand; its light weight meant I never felt fatigued using it.

PERFORMANCE. We checked the TH-UVF9 using a professional radio test set. Using a freshly charged battery, the 2m tests were done at 145.5MHz and the 70cm tests at 433.5MHz. RF power output was found to be 4.86W on 2m and 4.6W on 70cm, both of which are comfortably better than the specification in the manual. 2m receive sensitivity was 0.224μV; the real surprise was the 70cm sensitivity, which was measured at 0.138μV. This is a remarkable result.

The compact TYT TH-UVF9 with its excellent display photographed in direct sunlight.

CONCLUSION. I was very favourably impressed by the TH-UVF9 – it just 'felt right' to me. Even though it is supplied pre-programmed, I would recommend getting the programming cable with the radio, because I found the menu system a little clumsy – though no worse than many others. The relatively high power output and excellent 70cm sensitivity of the review sample make this £47.99 dual-bander a very attractive proposition.

My thanks to Sinotel UK Ltd for the loan of the review transceiver. You can see full specifications and download a manual for the TH-UVF9 at www.sinotel.co.uk.



The radio comes with a range of well thought out accessories.

QRP

QRP Convention Success

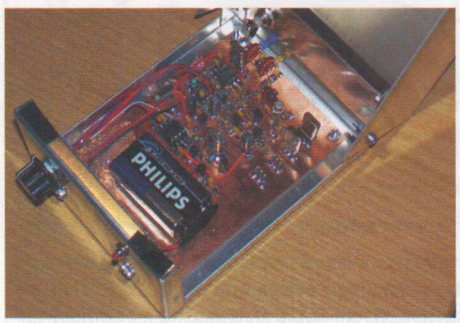
A REAL RALLY. The annual G QRP Club convention was held at Rishworth School in West Yorkshire at the end of October. The event was well attended and had its usual blend of traders selling components and surplus equipment. There are no commercial equipment or computer vendors at this event. A programme of lectures turns this event into a convention rather than a conventional 'Radio Rally'. Dom Baines, M1TKA, described QRP DX operating with an Elecraft KX3 from West Africa. He travelled solo operating from 6W and then C5, activating IOTA AF-045 along the way.

In contrast, DSP for under £50 was the title of the presentation by Ron Taylor, G4GXO. Ron described a low cost, high performance DSP system, including software, for an audio or transceiver project. Finally, Colin Turner, G3VTT, presented Simple and Effective TRF Receivers in which he introduced a range of receiver ideas for portable work and the constructor's shack.

All of the lectures were full with some people having to stand at the back.

Perhaps, for me, the greatest success was the Constructor's Evening held the evening before the convention in a local hotel. This included a Buildathon where a dozen novice constructors built a Stockton Bi-directional Wattmeter under the guidance of more experienced radio constructors. This was run by Steve Hartley, G0FUW and his Bath Buildathon team. Some of the participants had never used a soldering iron before but all of them went home with a fully working project. Seasoned constructors were invited to bring their favourite projects to 'show and tell'. This produced an amazing variety of homemade equipment showing that radio construction is alive and well. Watch future editions of this column for the announcement of the 2013 G QRP Convention and Constructor's Evening.

AMAZING RESULTS. In previous editions of this column I have mentioned the LA1KHA PP3 SOTA (Summits On the Air) Challenge. This is a challenge to see who can have the most QSO's from SOTA summits using a single alkaline PP3/MN1604 nine volt battery as the only power source. Colin Evans, M0CGH, e-mailed me about an amazing, very low power QSO he had as part of this challenge.



ROCKMITE: The 20m Rockmite transceiver used by M0CGH in the PP3 Challenge.

Colin writes, "I built a RockMite 20m transceiver recently to further my participation in LA1KHA's PP3 SOTA challenge. I substituted the Zener/resistor regulators used to supply the mixer and PIC chips with a low drop out 5V regulator (TS2950). The RockMite now uses about half the current on receive. The PA stage uses a 4:1 transformer in place of the RF choke on the collector to increase efficiency.

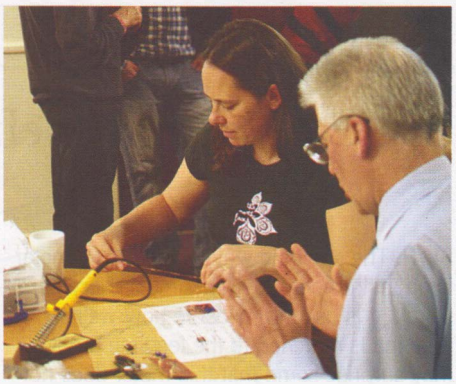
"I connected the rig to an antenna for the first time on Saturday whilst on SOTA summit Great Whernside in the Yorkshire Dales National Park, (G/NP-008 is the SOTA reference). Upon my first CQ call Barry, N1EU, in New York State, USA replied. My antenna was an inverted vee dipole fed with RG-174 coax, the feed point being about 6m above ground level. My PP3 battery is getting quite tired now, with over 100 QSOs under its belt. I measured the RMS RF power out using an oscilloscope, the peak voltage into a lab grade 50Ω load, was measured at 2.88V, giving me an RMS value of 2.1V. I worked out my power to be around 89mW RMS. The distance from Great Whernside, in IO94AD, to Barry, N1EU, in FN32BO, is 3245 miles, giving me a 'Miles Per Watt' figure of 36,460MPW! This is the best contact in my 15 years of amateur radio". To which I can only say, "Well done Colin!"

G QRP CLUB WINTER SPORTS. The G QRP Club Winter Sports is one of the most popular QRP operating events. Each year between Boxing Day (26 December) and New Year's Day (1 January) the club invites any operators to join in a QRP QSO Party using 5 watts of RF output or less. Operating takes place on and around the International QRP Calling Frequencies. These are:

CW: 1843, 3560, 7030, 10106, 14060, 21060, 28060kHz

SSB: 3690, 7090, 14285, 21285, 28360kHz

The Winter Sports is not a contest, although the G4DQP Trophy is awarded to the operator thought to have made the best overall contribution to the event. So "5NN BK" exchanges are not heard and participants often linger over interesting QSOs. It is usual for operators to exchange their G QRP Club membership number, if they have one. The event does provide an opportunity for operators who do not usually use low power to turn down their power to 5 watts or less and see what can be done. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Dominic Baines, M1KTA, e-mail m1kta@gqrp.co.uk, or by post to Dom Baines, M1KTA, 34 Bury Road, Stapleford, Cambridge CB2 5BP.



BUILDATHON: Christine, XYL of M1KTA, builds her first ever project under the guidance of Lewis from the Bath Buildathon team.

A NEW COMMUNICATIONS MANAGER. Careful readers of the QRP Winter Sports announcement will notice a difference between this and previous years. The G QRP Club Communications Manager has changed. The post was held for many years by Peter Barville, G3XJS, who gave the club a lot of very useful and willing service. Peter felt it was time to pass the role to someone new and the G QRP Club is delighted to announce that Dom Baines, M1KTA, has stepped into Peter's shoes. Dom has built up a reputation for activating some rarer call areas with QRP during his one man DXpeditions. Dom also runs a lively QRP based blog. I feel he will be a worthy successor to Peter.

AMATEUR RADIO IN THE COUNTRY 2013. Tim Walford, G3PCJ is pleased to announce that, following the very successful QRPiC 2012 this year, next year's event will be held on Sunday 21 July 2013. The title has been changed to reflect the enlarged range of amateur radio topics that will be on show – the scope goes well beyond the QRP oriented earlier events.

As before, it will be held at Upton Bridge Farm, Long Sutton, Somerset. The theme remains operation and home construction of relatively simple radio equipment, with the added attraction of a country setting! The style is more akin to a traditional radio rally of yesteryear, with less emphasis on modern commercially made equipment and plenty of opportunity to meet old friends and discuss radio matters. If the weather allows, it will be outside; otherwise, it will be in the farm barns like this year.

Antennas

SWR, reflection coefficient & return loss

SWR. The standing wave ratio (SWR) meter is an instrument found in almost every ham shack. It is used to measure how well an antenna is matched to the feedline but it may surprise some that this meter does not actually measure SWR. Perhaps it might be useful, for the benefit of newcomers, to describe just what SWR is and what the instrument actually does measure.

When RF power from a transmitter is fed to an antenna via a length of transmission line, all this power is absorbed by the load (antenna) and radiated – provided the load impedance is the same as the transmission line impedance. When a wave travelling along a transmission line from the transmitter to the antenna (the incident wave) encounters impedance that is not the same as the impedance of the line then some of the wave is reflected (the reflected wave). Whenever two same-frequency sinusoidal waves travel in opposite directions along the same transmission line, a static interference pattern (a standing wave) is formed along the line, as illustrated in **Figure 1**.

Standing wave ratio (SWR) is defined as the ratio of the voltage or current maximum to the voltage or current minimum along a transmission line. Note that these maximum/minimum measurement points are a quarter of a wavelength apart on the transmission line. Also note that the incident and reflected waves, together with static SWR pattern, are equal and opposite on the transmission line conductors (see **Figure 2**), so radiation from the transmission line is suppressed.

EARLY PRACTICAL SWR MEASUREMENTS. Long before their use in amateur radio, commercial station engineers used the SWR meter to adjust antennas to match the transmission line. These antennas were mostly located some distance from the transmitters and fed by 600Ω twin-wire feeder. The business of adjusting any antenna matching arrangement could be managed much more conveniently if a method of measuring the transmission line/antenna matching was available close to the antenna.

One such method is illustrated in **Figure 3**. A single-loop coil is arranged so that it couples with the magnetic field of one of the transmission line conductors. The induced EMF causes current to flow in an RF meter, whose reading is proportional SWR current (I). The trolley is moved along the line using the towing cord to a position where the current maximum and the level recorded. The loop is then drawn along the line to a current minimum and the level noted. The ISWR is then obtained from:

$$ISWR = I_{max} / I_{min}$$

MEASURING SWR ON COAX. The instrument shown in **Figure 4** is a coax line SWR meter for VHF/UHF. In this method an air-spaced coaxial line is constructed with a narrow slot in the outer conductor so that standing waves may be detected. The slot is at least a half wavelength long so that at least one maximum and one minimum can be observed. The slot has a negligible effect on the characteristic of the line because current flow is axial so the voltage distribution is not disturbed.

A voltage probe is used to pick up a voltage (V) that is proportional to that between the centre conductor and the inner surface of the outer conductor. The measurement procedure is similar to that carried out on twin line feeder as described previously. Note that in this case the instrument is sensitive to the voltage component of SWR and the method of measurement is the same as for current, ie:

$$VSWR = V_{max} / V_{min}$$

THE DIRECTIONAL COUPLER. It can be seen that two measurements at two different positions on the transmission line are required. However, SWR meters in use these days are located in one position in the line. They use a device called the directional coupler, also known as a reflectometer, which measures the characteristics of the incident and reflected waves and not resultant standing wave. It works because the currents and voltages of the incident wave (see Figure 3) are in phase while the currents and voltages of the reflected wave are 180° out of phase.

A simplified diagram of a directional coupler is shown in **Figure 5**. It comprises a small length of coaxial cable with a small loop of wire inserted running parallel with the centre conductor, with one end terminated in a resistance, R. **Figure 6** shows the equivalent electrical circuit. C is the capacitance between the loop and the centre conductor, M the mutual inductance between the two and E is the voltage between the outer and the inner conductors. I is the current in the centre conductor.

The loop and the centre conductor can be considered as a transformer, with the induced current in the loop converted to a voltage across R. This voltage is summed with E to produce a vector e. These currents and voltages are the components of the incident wave. The directional coupler has two loops, each with its own measurement meter or a meter that can be switched between them (or one loop whose direction

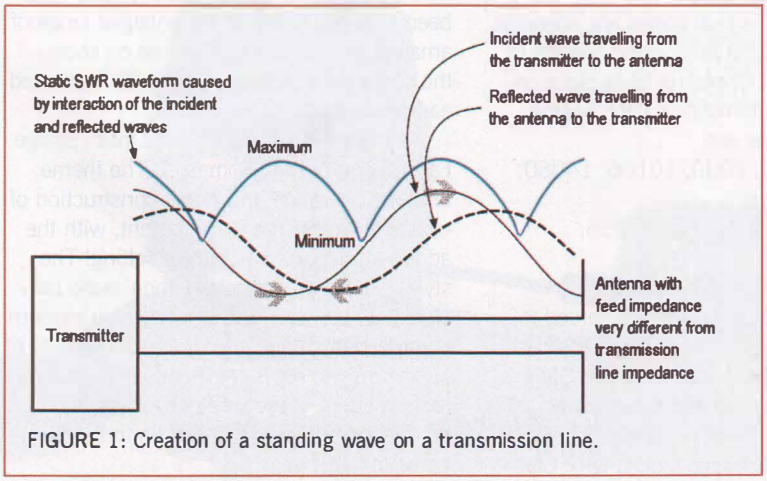


FIGURE 1: Creation of a standing wave on a transmission line.

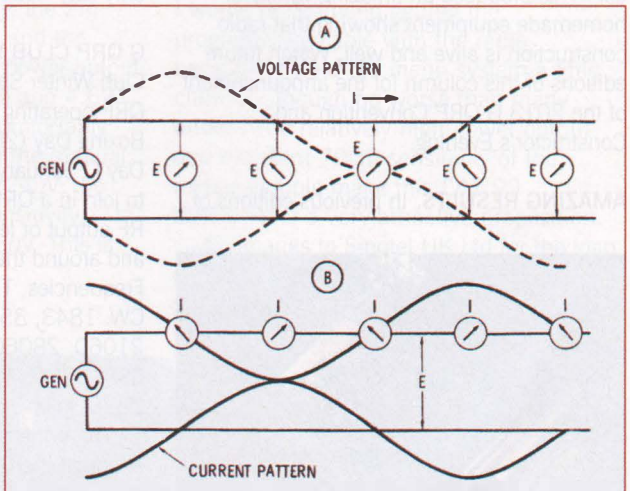


Figure 2: A two wire open-circuit line showing total reflection showing (A) voltage standing wave pattern and (B) a current standing wave pattern. (From *Radio Handbook 21st edition*, William I Orr, W6SAI).

can be switched). When the second loop is switched in, the current vector is 180° out of phase from the first reading (while the voltage phase is the same as the first measurement). These currents and voltages are the components of the reflected wave and their ratios are determined by the load at the antenna connection of the directional coupler. The method is described in greater detail in [1].

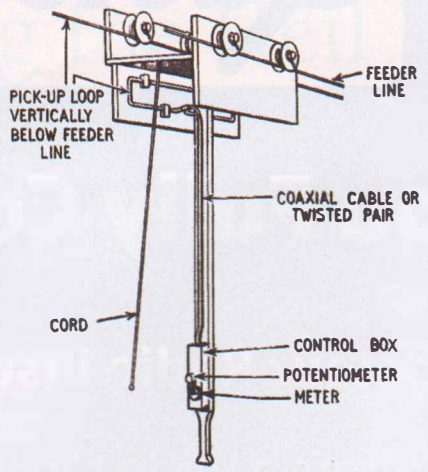


Figure 3: A current standing wave indicator for open-wire line. The instrument could be transferred to the other feeder conductor for checking the feeder balance. (From *The Services Textbook of Radio, Volume 5*).

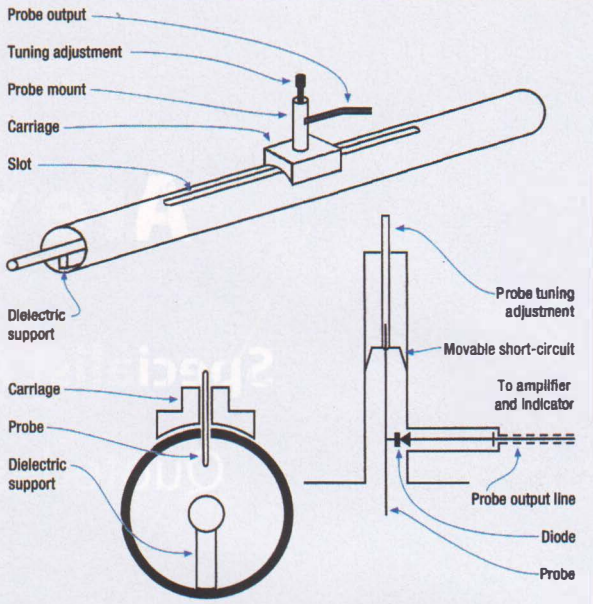


Figure 4: Details of a slotted line type of standing wave detector for coaxial line.

UNITS AND TERMS. What the SWR meter actually measures is the magnitude of reflection coefficient (rho) as compared to a given reference, usually 50Ω. The scale is marked in SWR units; this is possible because reflection coefficient magnitude and SWR are mathematically related. The reason why SWR is used is, I guess, is that everyone is used to it, the term being handed down from earlier methods as already described.

The term VSWR (rather than ISWR) is also firmly entrenched, even though current and voltage in the directional coupler have been used to create the measurement. My view is that SWR is more appropriate.

N6TZ, commenting on the term VSWR in [2], says "You will notice that I have steadfastly avoided the use of the expression 'voltage'. I do so to differentiate between parameters and units of measure. The parameter EMF (or electrical potential) is measured in the unit volts. If you step on a scale you are measuring the parameter mass (or weight) in the unit kilograms (or pounds). You are not measuring 'kilogramage' or 'poundage'; neither is the term 'voltage' grammatically correct for electrical potential, although it is widely used".

The relationship between SWR and reflection coefficient is shown in **Figure 7**. Such a scale can be used as a cursor on a Smith chart with the SWR 1:1 point pivoted in the centre of the chart and the infinity point on the outer edge. Such an arrangement enables SWR to be determined from any impedance measurement for example. Such a scale, when used on a Smith chart, is called a Radial Scaled Parameter. There are many of them.

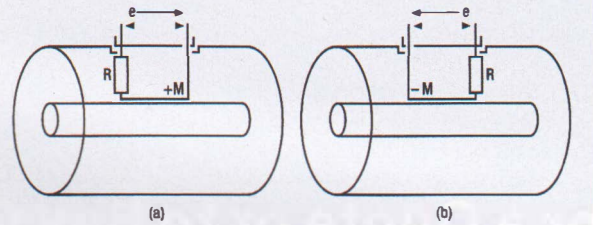


Figure 5: The directional coupler sensing circuit. At (A) the mutual coupling is positive, at (B), negative.

RETURN LOSS. One scale that is commonly used in literature these days is return loss (RL); this has been added to Figure 7 to show its relationship with SWR. The reason given for its use is that it gives a better resolution of small values of reflected wave compared with SWR. Return loss is defined as the measure in dB of the ratio of power in the incident wave to that in the reflected wave and has a positive value.

$$RL = 20*\log_{10} |(Z_1 + Z_2)/(Z_1 - Z_2)|$$

where Z_1 and Z_2 are the two impedances.

For example, if a load has a return loss of 10dB then 1/10 of the incident power is reflected. The higher the return loss, the less power is actually lost. To my mind this makes the term return loss rather counter intuitive. I may not be alone. The Editor-in-Chief of the IEEE noted [3] that the occasional incorrect use of the term return loss has grown into a flood of misuse and that 30% of antenna papers submitted have used return loss incorrectly.

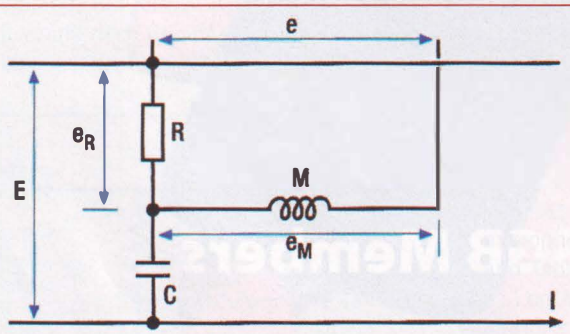


Figure 6: The basic directional coupler sensing circuit. C and R are the voltage dividing network. M is the mutual inductance between loop and centre conductor, E the voltage between the outer and centre conductor and I is the current in the line.

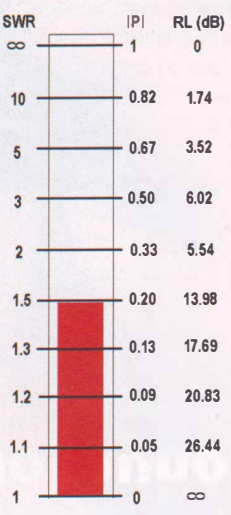


Figure 7: Various units of transmission line reflection compared. |P| is magnitude of reflection coefficient described as (rho) in the text

FINALLY. I wish you all a happy Christmas and a pleasant antenna experimenting New Year.

REFERENCES

[1] Reflectometers and directional power meters, M M Bibby, G3NJY, *RadCom* June 1968, also in *HF Antenna Collection.*

[2] *The ARRL UHF/Microwave Experimenter's Manual P5.38*, Dr H Paul Shuch, N6TZ

[3] Definition and Misuse of Return Loss, Trevor S Bird, Editor-in-Chief, Engineering, *IEEE Transactions on Antennas and Propagation Vol 51 No 2, April 2009*

Adapting the Heil Pro Set Elite iC

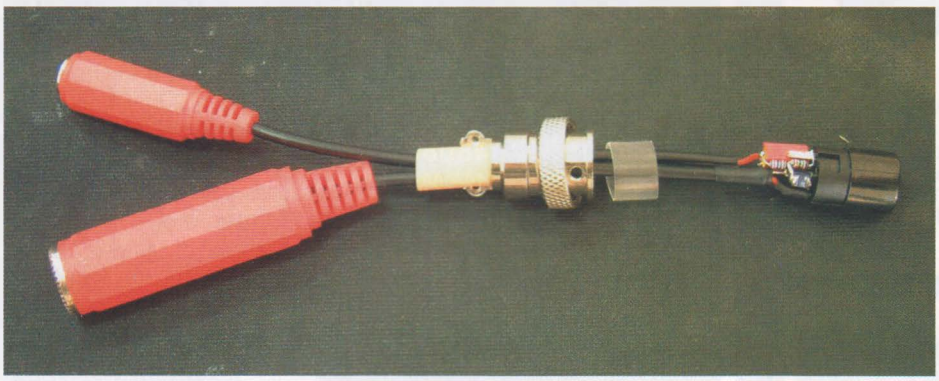


PHOTO 1: View of the complete adapter. The circuitry is built inside the right-hand connector.

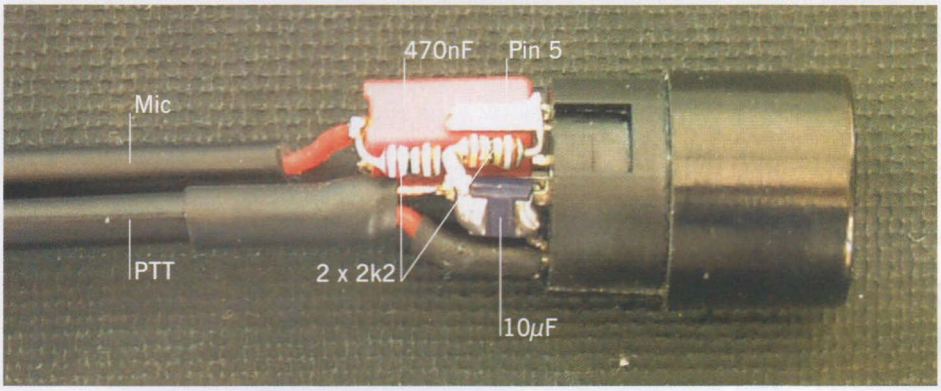


PHOTO 2: Close-up view of the construction.

INTRODUCTION. I guess this depends largely on one's voice but I have often found it difficult to get enough level from the standard microphones without speaking louder than normal or using excessively high gain settings. I also wanted a headset that I could use equally well with old and new Icom units, which use electret condenser microphones, and the Kenwood TS-2000, which uses a dynamic mic (and, potentially, other transceivers). The solution was the Heil Pro Set Elite iC. Designed to provide a higher level output to match Icom transceivers, it would provide the gain I wanted. But for use with non Icom systems it would need an adapter to provide the DC bias voltage feed required by the Heil iC condenser microphone element but block that voltage from entering the original mic input line.

For those unfamiliar with Heil headsets, a 3.5mm stereo jack plug is used for the headphones. A 3.5mm to 6.35mm (1/4") adapter is also supplied, enabling direct connection to most popular transceivers. The microphone uses a 3.5mm mono jack. Connection to the transceiver is by means of the Heil AD-1 series of adapters that also allow the connection of a PTT hand or foot switch via a 6.35mm jack.

So here – with no claim to originality – is my solution for the Kenwood. It could also be used with other rigs with the appropriate changes to wiring and connectors.

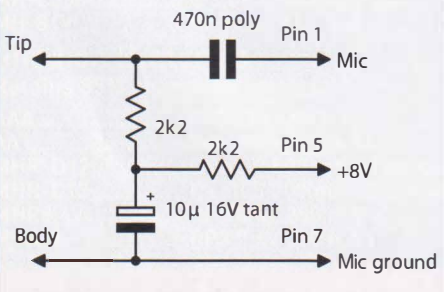


FIGURE 2: My DC feed/blocker circuit for the Kenwood TS-2000.

DESCRIPTION. As mentioned earlier, the iC microphone element requires a DC bias voltage and, conveniently, Kenwood provides +8V on pin 5 of the 8 pin microphone connection (see **Figure 1** and **Table 1**).

I decided to follow the same format as Heil's AD-1 series adaptors but fit the necessary additional components within the 8 pin cable connector. Figure 2 shows the circuit diagram of the adapter. The suggested range of values for the DC blocking capacitor is between 330nF and 1µF. The actual value will have a slight effect on the audio response. For my purposes 470nF was ideal.

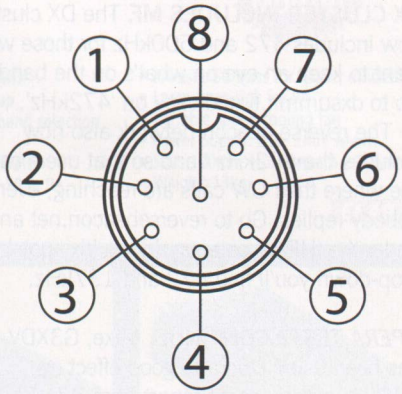


FIGURE 1: 8 pin plug pinout, viewed from cable side of plug.

In order to get a professional-looking finish, I used moulded-on 3.5mm and 6.35mm sockets that I had trimmed off commercially-available extension leads. This approach can also be cheaper than buying separate sockets and cable.

By using miniature 0.4W resistors and a surface mount 10µF capacitor I was able to build the adapter circuit within the body of the microphone connector. **Photo 2** shows the layout.

To make room for the components within the connector housing the unused pins (3, 4 and 6) are removed. Next the tail from the 6.35mm socket is soldered, screen to Pin 8 and core to Pin 2. Short pieces of heat shrink sleeve should cover both joints. Fit the components and then connect the tail from the 3.5mm socket.

Before final assembly, test the adaptor to verify correct operation and then carefully slide the internal insulation sleeve and shell into place. Although a snug fit, it should locate easily without requiring any undue force. If not, review the assembly and try again. Finally, fit the cable entry clamp.

TABLE 1: KENWOOD MIC CONNECTIONS

Pin	Function
1	Mic
2	PTT
3	Down
4	Up
5	+8V
6	Rx audio (some models)
7	Mic ground
8	PTT ground / chassis

LF

Looking forward to 2013 on MF

DX CLUSTER INCLUDES MF. The DX cluster now includes 472 and 500kHz for those who want to keep an eye on what's on the band. Go to dxsummit.fi and click on '472kHz'.

The reverse beacon network also now includes the 472kHz band so that users can see where their CW calls are reaching, even if nobody replies. Go to reversebeacon.net and under the 'HF >' category in the 'dx spots' drop-down you'll find 472 and 137kHz.

OPERA TESTS CONTINUE. Mike, G3XDV has been using *Opera* to good effect on 136kHz with a recent report from R7NT in the middle of the evening, a distance of 2837km. On another day he had a late night copy from RX3DHR at 2584km and RX3QFM at 2682km.

SOFTROCK ADDS LF & MF COVERAGE. The Ensemble SDR kits from KD9YIG now have the option to add 136 or 500kHz coverage. This would be a good basis on which to build an all mode transceiver for either band. See fivedash.com for more.

VENEZUELA COPY. Martin, YU7MAE has been improving his 136kHz grabber and in early September copied signals from VO1NA and MP (VE3OT). This bodes well for the coming 'season' of LF activity.

PHILIPPINES GETS 136 AND 472kHz. Latest to arrive on MF is DU, with a memorandum from the Philippine authorities allowing full operation on both the 427 – 479 and 135.7 – 137.8kHz bands.

472kHz HERE SOON. Disappointingly, it looks as though our access to 472kHz may be by NOV, like 5MHz, rather than by default. In anticipation of us having some way of getting on the band, for the rest of the column we'll concentrate on how to do that.

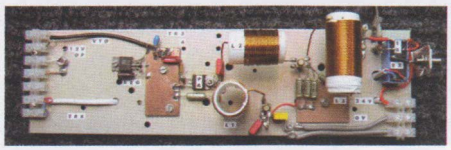


PHOTO 1: A test rig without the keying circuit.

Last time we took a look at aerials, so this time we'll turn our attention to receivers and transmitters for the band.

Receiver. Although most transceivers go down to below 136kHz they are pretty deaf down there. On 472kHz the sensitivity problem is not so bad. Unfortunately, the HF transceiver will not be fitted with much in the way of input filtering below 1.6MHz. Thus the whole of the medium wave broadcast band will be present at the first stage, causing severe breakthrough. A simple preselector or low-pass filter circuit between the aerial and the receiver will work wonders.

Source of drive. If CW is your main interest, then a simple crystal oscillator and divider will get you started, but you will miss contacts if you can't QSY. Roger, GW3UEP has built a VFO on 3.8MHz that he divides by 8 in a CD4024. With a careful choice of components this is stable enough for CW use.

For modes such as QRSS or *Opera*, which require better stability, a synthesiser is the best choice. There are now many DDS kits available, for example GW4GTE has the 'Multi-Rock' kit that is easy to build and I have used with success (www.s9plus.com).

Of course, you could build a transverter from any band, but some older transceivers will produce a small amount of RF on 472kHz if the amateur bands only interlock is disabled. The Icom IC-735 and IC-706 will work but the output is quite low and rich in harmonics, so you would need to filter and buffer it before amplification.

Transmitter. Roger, GW3UEP, with a little help from Mike, GW4HXO and Finbar, EI0CF, has been developing his Class E 'QTX' (Quick transmitter) PAs for a couple of years now and their very simple designs are thoroughly developed and tested. If you stick to the recommended parts (see **Figure 1**) it should work well first time. The PA needs a 12V square wave drive source from a CMOS device. If you have a sine wave source or a lower voltage square wave drive then it can be squared and brought up to 12V CMOS levels by using the circuit of **Figure 2**. Power this buffer from the TX line so that it doesn't stay powered without an input.

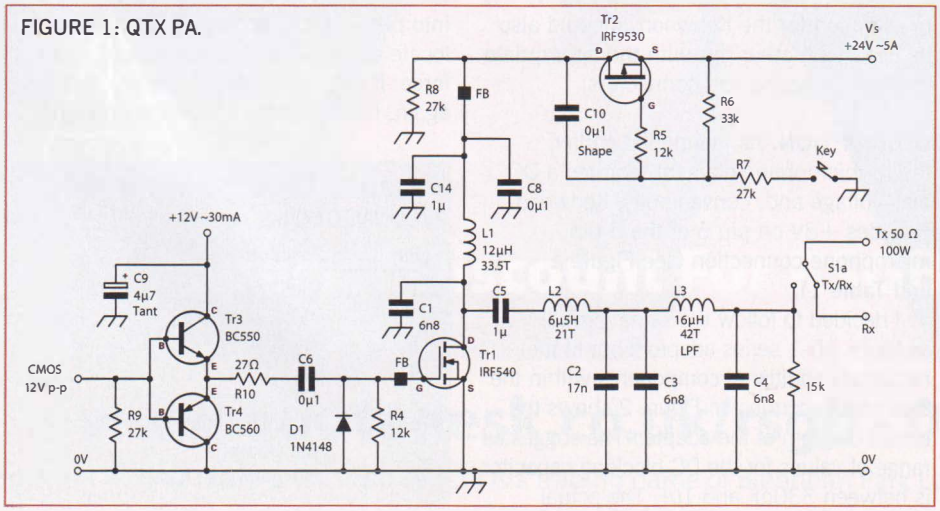
The PA coils must be close-wound on 22mm diameter plastic pipe with 20swg (0.9mm) copper wire and the capacitors C1 to C4 in the output stage should be 'pulse rated' polypropylene types such as Wima FKP2 (from Rapid) or LCR PC/HV series (available from CPC). The Wima capacitors are 100V so are not suitable if you wish to increase the power level, described later. The odd values need to be made up with parallel combinations of capacitors C5, 6, 8, 10 and 14 should be Wima MKS4 metallised poly types. Arrange the coils at right angles to each other, as in the picture, to avoid unwanted mutual coupling.

Photo 1 shows a test rig without the keying circuit. Itis very simple to construct and doesn't require special techniques. With a suitable heatsink it is capable of 100W at 80% efficiency with a 24V supply.

This design could form the basis of a more powerful transmitter and Roger suggests using BC327 / BC337 as driver transistors if your chosen FET has a higher gate capacitance than the 1200pF of the IRF540. The 540 is a 100V device and the 200V IRF640 could be used with a higher supply voltage to produce more power. Mike, GW4HXO is getting 150W from an IRF640 in this circuit and beefier FETs are available for a couple of pounds. To avoid instability with the IRF640 and other more powerful FETs, Roger suggests fitting the 27Ω resistor R10 at the gate of the MOSFET.

This PA is only suitable for on/off keying modes such as CW, QRSS and *Opera*. For other more complex modes a linear PA is preferred. For some ideas, have a look at DL4YHF's website (http://goo.gl/omzd5) where he has some plans for a linear(ish) PA driven by an IC-706.

FIGURE 1: QTX PA.



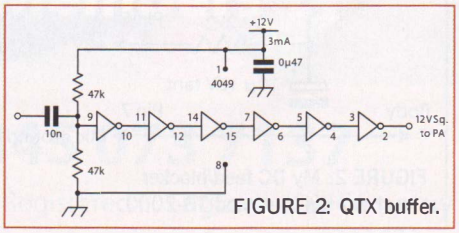


FIGURE 2: QTX buffer.

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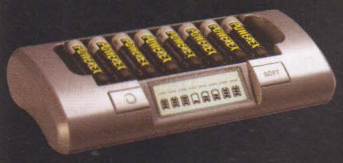

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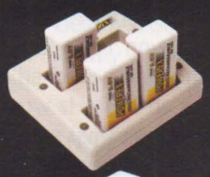

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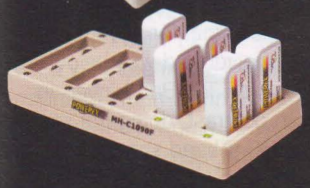

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HF

The latest news and DXpeditions

I am posting this column a little earlier than usual as my wife and I are off on a much needed holiday, so my apologies if your news items fail to appear – all being well I will catch up next month. As I finalise this, I have today worked (mid morning) XX9TXH (Macao) long path on 12m CW with a cracking signal and then, mid-afternoon, AA4VK/CY0 (Sable Island) on 15m SSB, also with a huge signal. I've also knocked off several Caribbean DXpeditions, warming up for the CQWW Phone contest. Which leads nicely on to a review of the month's activities and propagation.

ACTIVITY. October propagation was almost a repeat of last year, with some good high band conditions on a number of days. That said, as I write this the T30PY (Tarawa) expedition has just wrapped up, with some 40,000 contacts in the log (just short of 9000 with Europe). There have been very few opportunities for the UK on 10 and 12m (and, sadly, what was probably the best opening on 12m was marred by deliberate interference), but 15, 17 and 20m have all yielded QSOs. The only UK station I know to have worked T30PY on 10 and 12 was Clive, GM3POI in the Orkneys. This is fascinating as one might expect stations in the south to enjoy better propagation on those high frequencies. For more on this, see my comments later in this column. The TT8TT (Chad) expedition was a different matter, being almost directly to the south, workable with relative ease on all bands 160 through 10m. 3B9SP (Rodrigues) was similar, at least on the higher bands.

As always, I very much enjoyed the RSGB Convention, meeting many HF enthusiasts and sitting in on various presentations, not least the death-defying antics of last year's Rockall expedition! I would also commend the amusing and insightful talk by Rob, MOVFC, just back from Tristan da Cunha where he had operated as ZD9UW. One of his comments highlighted the raised expectations we have nowadays from online logs and OQRS (Online QSL Request). One French station had sent Rob a chasing e-mail asking why he hadn't received his QSL card yet. This was received while Rob was still in Cape Town waiting for the flight back home, having just arrived back on the boat from Tristan!

DX NEWS. Not a lot of expeditions are planned for this month, perhaps not surprisingly as most people will be at home for the festive season. Expect things to pick up again in the spring – I already have news of a number of planned operations but will be covering them in the relevant month's issue. Most of the few operations I have seen announced for December are 'holiday style' activities, in other words someone taking a radio along as an extra sideline as part of a family holiday. I tend not to mention such operations, because as often as not they simply don't amount to very much; the chance of catching them other than by sheer luck is minimal.

Sigi, DK9FN says he will be in Temotu as H40FN from 22 December until 7 January. "Because of demand, emphasis will be given to 160, 40, 30 and 20", he says. Sigi also notes that on the previous visit he worked a lot of 80, 17, 15, 12 and 10m.

Do, by the way, check out the ARRL 10m contest, which takes place on the first full weekend of December and, propagation permitting, is a good chance to pick up some nice ones on that band (and learn a little more about 10m openings).

HEARD ISLAND 2014. News continues to trickle out regarding the Heard Island trip scheduled for 2014. There is already a website up and running and several team members have been named. There is quite a lot of crossover in terms of plans and personnel with the Clipperton Island trip scheduled for March 2013 (more news on that one in due course). Scientist and DXpedition veteran Dr Robert Schmieder, KK6EK is involved in both, and both will have a strong science element.

SNIPPETS. A new online DX spots site, http://dxfor.me, is well worth a look. You can set various filters, for example if you are specifically looking for a few current DXpedition operations.

The United States postal service recently increased its rates, which means that sending one dollar for return postage is no longer adequate, the international rate now starting at $1.10.

160m PATH LOSSES. I recently rediscovered a 2001 article by propagation guru Carl, K9LA on the subject of path losses on 160m propagation. There is a lot of heavy theory, referring to Appleton-Hartree equations and the like, but the bottom line is that multi-hop QSOs of more than about 10,000km are impossible on 160m due to path absorption. For one path he looked at, the theoretical path loss on 1.8MHz would be 106dB, with a -190dBm signal delivered to the receiver. This latter figure is below the minimum discernible signal for any current amateur radio transceiver and well below ambient noise levels on Top Band, even in a quiet location. In contrast, doing the same calculation for the 80m band showed a signal power at the receiver of -106dBm, a

PHOTO 1A & B: The recent 3D2C expedition from Conway Reef – a view of some of the operators

COUNTRIES WORKED, 2012
(starting 1/1/12, listed by SSB total)

Call	CW	SSB	Data	All
M0VKY	156	194	0	240
MU0FAL	161	114	0	176
G4XEX	0	94	92	123
G0RPM	97	89	123	171
G4FVK	70	85	0	85
G4DDL	117	53	47	123
G6CSY	45	27	60	69
G3HQT	198	0	1	198
M0BVE	164	0	0	164

huge difference, leaving the equivalent 80m signal at a level that should be readable in anything but a noisy urban environment. Longer paths on 160m rely on ducting, which can reduce the path loss significantly, to as little as 37dB in one propagation mode that Carl modelled. But getting signals into, and out of, the duct requires a tilting of the ionosphere that, typically, happens at dawn and dusk. Many Top Banders, myself included, have personal experience of this, hearing and working New Zealand at good strength at our dawn (via ducting) when US signals (via multi-hop) are much weaker, despite being so much closer. I remember first reading an article about dawn and dusk enhancement on Top Band as long ago as 1970, but it is only nowadays that we have tools to model these various modes and calculate the impact on signal levels. The Stew Perry contest at the end of December and the CQWW 160 CW contest at the end of January are great opportunities to experience Top Band propagation first hand.

HIGH BAND PROPAGATION. I mentioned earlier that Clive, GM3POI was able to work T30PY on both 12 and 10m. Both contacts were very late in the evening, not far short of midnight when common sense might dictate that the MUF would be well below those levels and, indeed, Clive's own forecasts using *VOACAP* did not suggest an opening at that time. To probe this one further, he and Gavin, GM0GAV have been running VE3NEA's *FAROS* software through the night to monitor the various NCDXF beacons. It is early days and I hope to have more to report in a future column, but even after one night's monitoring they were surprised to find that their receivers had copied the W6, KH6 and JA beacons over the North Pole on 10m in the wee small hours. As always, HF propagation never ceases to surprise. Clive was trying to get some stations in the south of the UK to do similar monitoring to see whether the same results would be found or whether this really is a case of stations closer to the pole having an advantage.

CORRESPONDENCE. Dave, M0BVE says, "Only 3 new ones this month due to XYL 'requesting' the shack be re-decorated, therefore 2 weeks off the air!". Those new ones (CW as usual) were A92GB on 15 plus EA9/IK4ALM and HI9H on 30.

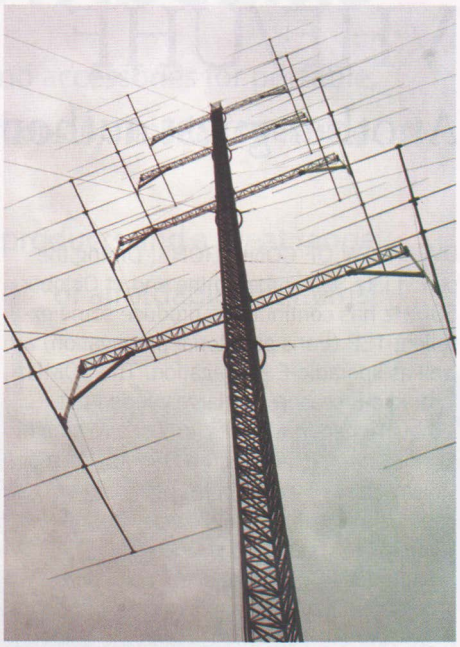
Simon, M0VKY considers that the high bands were in good shape and reports working T6JC on 40 CW, 3D2GC on 20 CW, HL5AP on 15 CW, ZD9UW on 10 SSB, 3D2C on 10 CW plus 17 and 20 SSB and NH8S on 20 SSB and CW.

Terry, G3RKF says he has "Just added another string to my bow". This by way of RTTY and PSK. Results so far, while nothing exotic, have been very encouraging – the US on 15m and Japan on 17m, all with 30 watts and those indoor antennas. I am more envious, though, of the home produced apple crumble and chutney that he mentions!

Peter, G3HQT comments that P29VCX (the IOTA expedition with G3KHZ and others) was a remarkably consistent signal on several bands for much of the day. He worked them on three bands including 30 and 17 just ten minutes apart. Other DX (all CW) includes 5U6E on 30, XU7SSB, BY1WXD/0 (Lhasa) and 5H1HS/3 (Lazy Lagoon Island!) on 20, TT8TT on 17, A71A on 15, 9J2GR on 12 and 5R8AL on 10. Graeme, G6CSY says "Conditions have been rather poor, although the radials of the vertical antenna have been very well watered!" His last 'good day' on 15 RTTY gave KH7M for an all-time-new one, YC2WAN and then W7CT for a new state (Utah).

Noel, G6ENY (good name for a December issue!) sends in a report for the first time. He usually runs 200 watts from a TS-480HX to a G5RV suspended from a tree in the garden, but the tree was due to be removed recently (bad planning, I call that). Anyway, as a consequence he reverted to his FT-817 and an 8m vertical antenna purchased recently at a rally. The outcome is that he has been enjoying his first taste of QRP, with some very pleasant surprises on both phone and WSPR. At first he was slightly disappointed with the results on phone but persevered as other QRPers had told him that the moment would come when propagation and other factors would be in his favour. Sure enough, Noel went on to enjoy a number of successful QRP phone contacts around Europe on 40m. He also takes the opportunity to wish other readers a very Merry Christmas.

Noel's missive leads me to make a few comments of my own. I am by no means known as a QRP operator myself (quite the opposite for much of the time) but my experiences in, for example, NFD operating in the QRP section with my local club, have brought home to me just what can be achieved, not so much on phone but certainly on CW. When propagation is favourable, QRP (internationally recognised as 5 watts or less) can span great distances, particularly if attention is paid to having a good antenna and minimal losses elsewhere in the system. This is even more true when using the excellent low-signal digital modes now available (WSPR, which Noel mentions, would not necessarily be my first choice – it was developed for propagation monitoring rather than two-way communication. JT65HF and others are probably to be preferred). Higher power becomes necessary for two reasons. Firstly, when propagation is marginal, with high path losses (typically, when a band is barely open or on the low bands where absorption is greatest – see my earlier remarks about 160 and 80) and, secondly, when there is a lot of competition, for example in chasing a DXpedition operation. Propagation can, of course, change very quickly indeed. I may well have mentioned it before, but I vividly recall working Russia on 20m CW while helping a local amateur try out his homebrew driver stages – he had yet to build the PA, so we were running no more than about 200mW (albeit to my HF Yagi). But, during the contact, there was a change in propagation and we were barely able to complete the contact with my own transceiver and amplifier at the 400 watt level. So, yes, it really is a case of being on the right band at the right time.



ES5TV's new 15m array.

Finally, a very Merry Christmas to each and every one of my readers and I do hope Santa manages to get that new transceiver down the chimney without voiding the warranty in the process!

WEBSEARCH
Clipperton Island 2013: www.cordell.org/CI
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VHF/UHF

Another guest author catches up with the latest VHF & UHF news

OVERVIEW OF CONDITIONS. During the period late September to the end of October, 50MHz has continued to produce some excellent TEP (trans equatorial propagation) as well as sporadic-E propagation. The 70MHz Sporadic-E season has largely faded out although there have been one or two small openings from the UK. The Orionids meteor shower peaked mid month, providing an opportunity for the 'Ping Jockeys' to make some good long distance QSOs.

Up on 144MHz, tropospheric propagation (tropo) was flat in the early part of October although, from 22 to 24 October, conditions picked up dramatically. Make More Miles on VHF (MMMoV) [1] seems to indicate that only the eastern side of the UK had the good conditions on the 22nd, whilst on the 23rd and 24th conditions improved for the western side of the UK. This is borne out by reports received from G4SWX (JO02) and GW8JLY (IO81).

432MHz saw quite a lot of activity during the 'lift' in conditions around the 23/24 October.

PHOTO 1: M0BKL's fine antenna array, consisting of (bottom) an M_2 6m 7-element Yagi on a 30ft boom. The middle antenna is an Eagle 4m 6-element Yagi and at the top is the M_2. 2m 12 element Yagi. Photo M0BKL.

50MHz REPORTS. The first report comes from Steve, M0BKL (IO80). He reports an excellent opening into ZS on Sunday 30 September with both beacons becoming audible at around 1200UTC. These were followed by contacts with ZS6JON, ZS6IO, ZS6WAB, ZS6OB, ZS6AYE, ZS6A, ZS6NK and V51YJ. Also in the log were TT8TT and TR8CA but Steve did miss the 5U and TJ. Steve's antenna system is shown in **Photo 1**.

Bob, G8HGN (JO01) heard the ZD7VC beacon on 50.007MHz at 519 on 9 October at 1856UTC. This followed from an earlier spot by an LA. Bob was waiting for the start of the 144MHz UKAC and was monitoring for the beacon when it appeared for, perhaps, two minutes before fading out. Bob thinks it may have been TEP enhanced by another mode. On the 19th he heard beacons TR0A and 6V7SIX, on and off between 1430UTC and 1520UTC at 319 weak but copiable. Later, TR8CA appeared from JJ40 and was worked at 1545UTC, with reports of 55 out 59 in, for a new DXCC #82.

Bob uses an FT-847 with 100W to a 6 element LFA at 13m AGL and 60m ASL.

On 15 October, John, G4BAO (JO02) heard 6W7SIX beacon and the TT8TT expedition by what he believes was Sporadic-E with extended first hop to the Mediterranean and then a second hop to the DX, John worked 16 stations across Europe using a mixture of Sporadic-E and extended tropo scatter.

70MHz REPORTS. G4BAO, also worked a number of 4m stations using Sporadic-E between 22 September and the 11 October, an indication that even this late in the season 70MHz is capable of giving some good contacts. As would probably be expected these contacts were mainly to the south east from the UK although he did work two OZs as well.

I was also active on 70MHz during October and although most of my contacts were also into the Balkans area, I did find time to run some digital tests with G4FRE (IO81) during October. We were trying ISCAT [2] to see if it was possible to use aircraft reflections to improve the reliability of the path between us. The conclusion was that over the path between us JT65B had between 6 – 8dB advantage, which largely agrees with what K1JT has said previously. It's good to know we are in agreement!

144MHz REPORTS. In last month's column, G4BAO mentioned growing interest in using JT65B to make EME contacts using a small station setup. It was therefore pleasing to receive a report from Nick, M0DSR (IO82) detailing his recent success with just such a small 144MHz setup.

Nick admits to being a dedicated HF DX chaser. After chatting to Ian, G0UWK, one evening he decided to give 144MHz meteor scatter a try with his 100W rig, 'simple beam' antenna and FSK441. Having found he could now work across much of Europe on MS he upgraded to a 10 element 3 wavelength BVO Yagi to try to further improve results. However, during the quiet periods when there was little MS activity he decided to have a go at EME using JT65B. After much perseverance Nick had his first QSO with I2FAK on 12 October, followed by EA2AGZ.

What is particularly inspiring is that Nick lives in a known poor area for VHF propagation (I know because I used to live near there in northern Staffordshire). He also used only a single Yagi and 100W. Over a two month period Nick overcame various hurdles to make his first EME QSOs. He now admits to being hooked!

Nick wished to pass on his thanks to G0UWK, G4SWX, GM6VXB and F1VJQ (G8APZ in disguise) for their help and encouragement.

John, G4ZTR, responded to my request for VHF input by asking if I would be interested in some of his recent 2m EME QSOs with single Yagi stations because he felt this was 'pushing the boundaries a bit' from his modest station. Stations successfully worked included F1VJQ (IN95) using a 12 element Yagi without elevation, DJ3VI (JO43) using a 5 wavelength long

Yagi and DL4DWA (JO61) using a 13 element Yagi.

John's own setup consists of 400W to a box of 4 x 8 element IO JXX Yagis.

Well known 144MHz band operator, Lyndon, GW8JLY (IO81) says that on 23 and 24 October, conditions were such that he was able to make several QSOs at over 1000km. All these and a lone OK QSO, were with DL stations close to the OK border. His QSO with Juergen, DF1CF at 1076km gave him the ODX of the opening. Juergen had an outstanding signal at 59+ and was the strongest signal Lyndon heard during the opening. He comments that this should not surprise anyone as Juergen's QTH, near Kempten in South Bavaria, is at 1000m ASL.

As well as QSOs with DL-land, other longer distance QSOs were completed with several HB9 stations and with many F stations close to the HB border. Unfortunately, on this occasion, he could not hear the OK, S5, 9A and HA stations worked by some on the east coast and by stations across the North Sea.

Lyndon enjoys MS very much and usually tries to complete at least one MS QSO each day. This mode has continued to give him new locators each month and he is always looking on the ON4KST 'chat' for new stations in new locators with which to try a FSK MS QSO. As long as these stations are within about 2000km he can usually complete a QSO. October's new ones were UA2FT (KO04) and SM1FMT (JO96).

Lyndon says you don't need high power for MS. UA2FT uses an FT-897D transceiver with just 50W RF output and produces excellent reflections. In fact Lyndon has completed an FSK QSO with SP5TWA (JO91) who used just 35W and a single 7 element Yagi. If you don't yet use MS, try it, you will be amazed at the results.

My neighbouring big signal comes from John, G4SWX (JO02). John operates a large station in Suffolk. The 144MHz antennas system at John's station can be seen in **Photo 2**.

John had over 170 QSOs on the 144MHz band during October. 2 October was the Nordic Activity Contest night (there are activity contests in other European countries) when he worked 13 OZ and SM stations at over 600km in what was very average conditions. The best DX was SK6DK (JO67) at 899km.

Taking advantage of the good (low degradation) EME conditions early in the month he had 80 EME QSOs, working the DXpedition to Jersey and Guernsey by DJ4TC. MJ/DJ4TC was worked on 4 October and MU/DJ4TC on the 9th.

XE2AT (DL81), CX2SC (GF25) and ZL4LV (RE54) were worked on 7 October with PY2GN (GG56) on 11 October and FM8DY (FK96) on 13 October. Working the Martinique station, FM8DY, was particularly pleasing for John as he had three previous partial contacts, losing his signal, before completion of the QSO.

The Orionids meteor shower yielded some consistent, but not spectacular reflections between 18 and 21 October. Of note in his ten FSK441 QSOs are a couple of random QSOs including SV6KRV (KM09) at 2046km, all of these QSOs were completed in less than 5 minutes.

However, for John, the month really got going on 22 October. From the DX cluster spots and the Hepburn maps it was clear that there was a lot of ducting between Holland, Belgium, the Western part of Germany at one end and Austria and the Czech Republic at the other. However, nothing much was heard in JO02 for most of the day and all of the beacons up to 800km distant remained normal.

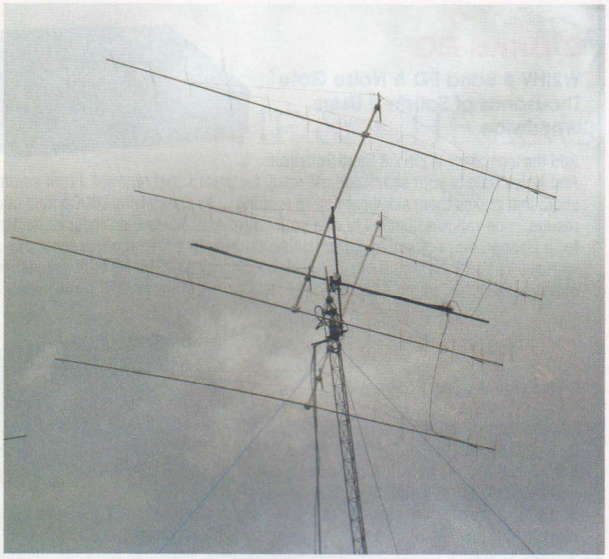

PHOTO 2: The 144MHz antenna system at G4SWX's station in Suffolk. It currently consists of four IOJXX 16 element Yagis with full azimuth and elevation control. Photo G4SWX.

At 1837UTC, the CW signals of HA1FV (JN87) came out of the noise and 559 reports were exchanged over the 1222km path. A few OE stations were then worked and finally the CW signal from 9A2AE (JN86) 519 reports were exchanged over the 1285km path.

On the following day, the 23rd, many thought the duct had moved further west. At 1130UTC, 54 SSB reports were exchanged with HG1DRD (JN86) at 1289km and at 1207UTC 57/59 reports exchanged with HA8MV/P (KN06) at 1504km. Both of these Hungarian stations were then audible for several hours. Quite a number of other stations were worked including: OK2GD (JN79) at 1041km, OE2XRM (JN67) at 966km, OM3CQF (JN88) at 1191km, OE3FVU (JN78) at 1113km and OK1AJY (JO70) at 975km.

Late on the 23rd the ducting moved around and stations towards the south of France in JN23 and 24 were coming through.

Of note was a QSO with Marius, F8DO (JN26) whose QTH is overshadowed by very high hills that completely block all signals from the north. Marius and John were both beaming towards JN36/37 and working using signals reflected by the Alps.

As the ducts moved further west John worked F4EXL (IN86). The distance was only 651km but it is a very rare square, usually only activated by DXpeditions.

On the 24th the South and the Atlantic coast of France produced good signals, the best being F4TXU (JN23) near Nimes at 940km. Another fixed station in a rare square was F1VEO (IN77) at 640km. Felix was also worked by other UK stations including G3XDY JO02 on 432MHz.

By the end of 24th nearly all had faded away, leaving log books well filled. John says it was good to see a lot of CW activity with many operators working a mixture of both modes on the same frequency.

432MHz REPORTS. Bob, G8HGN, reports that during the IARU 432 – 248MHz contest his ODX (best DX) was DL0GTH (JO50) at 729km, with three HB9s in JN37. Activity from the UK was 'very poor' according to Bob.

Later in the month the enhanced conditions around the 23rd and 24th led to many long distance QSOs on this fine band. Whilst most of the DX was being worked across central Europe on the 23rd, with few UK contacts listed on the DX Cluster, the 24th was a different matter. Just as with 144MHz, on the same days, conditions improved for UK stations located further to the west. Among the QSOs listed on the DX Cluster were 2E0NEY (IO81) who worked F1PYN (JN25) at over 800km and F4FCW (JN38) with 52/51 reports. M0BTZ (IO90) worked F6DQZ (JN19) at 59 both ways whilst G3XDY (JO02) worked F1VEO (IN77) at 52 both ways.

There were many 70cm beacons reported on the Cluster list by UK stations during this period, but not so many QSOs. This seems to be the story with 70cm in recent years. Many listeners; not so many making QSOs.

SIGN OFF. It looks like I've run out of space. My grateful thanks to all those who submitted reports, many at very short notice.

WEB SEARCH

[1] Make more miles on VHF: www.mmmonvhf.de/

[2] ISCAT: http://physics.princeton.edu/pulsar/K1JT/

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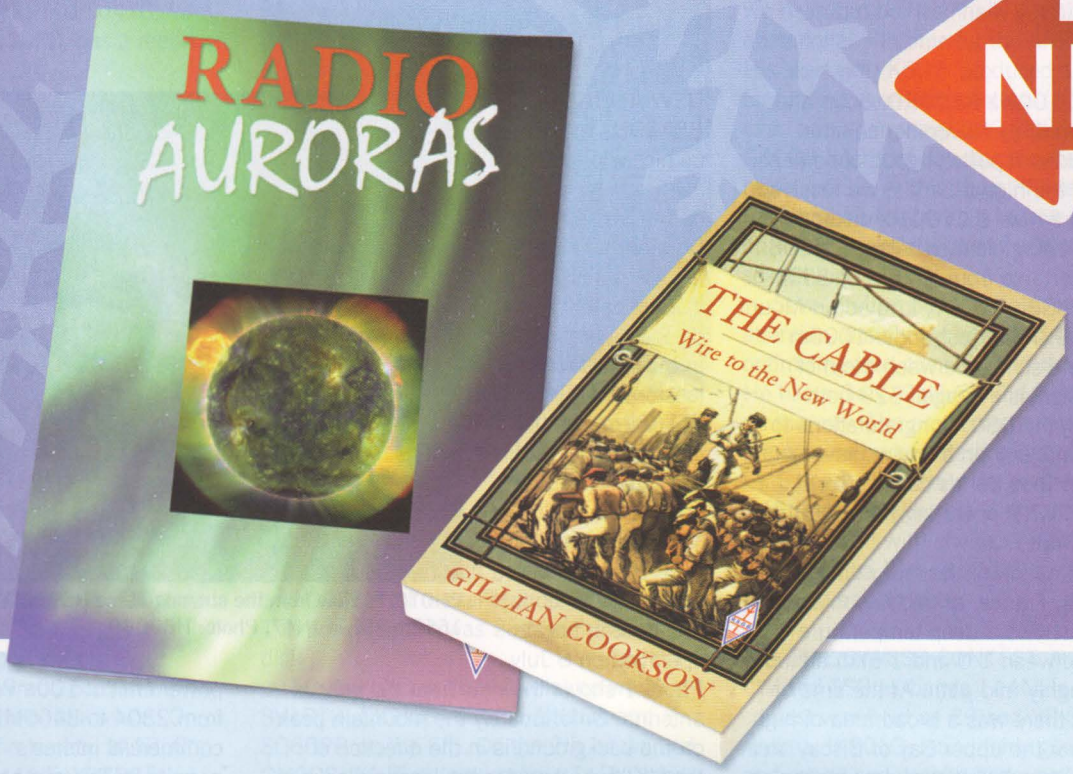

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The late Charlie Newton, G2FKZ, who wrote the core material of this book, was acknowledged as one of the leading experts on radio auroras. His work has been updated and supplemented with a new chapter compiled by well-known VHF DXer Neil Carr, G0JHC. Using contributions from a number of the UK's leading VHF DXers, Neil Carr looks at the major radio aurora events that took place during the last solar cycle and in the first part of the new cycle.

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By Gillian Cookson

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GHz Bands

All the latest microwave band news - and a new world record

A NEW UK 10GHz RECORD. Soon after I had prepared my November column, which included reports of good conditions on some of the higher bands, we received reports that a new UK 10GHz distance record was being claimed. Alan, GM0USI, operating portable from IO76xa at 330m ASL worked Guy, F2CT/P, located on Mount Baigura (IN93ih) at just under 1000m ASL, with a distance between them of 1428km. Signals averaged 529 both ways during the QSO. Congratulations to both Alan and Guy on a fine achievement. The October GHz Bands column carried a picture of F2CT/P operating from JN34 in the French Alps.

An examination of the radiosonde data [1] for Brest, France, at midday on 15 September shows a deep temperature inversion between 1.0 and 1.5km altitude. Brest is roughly mid path. At the time of the contact there was a broad area of high pressure over the upper Bay of Biscay area. It would seem possible that descending air in the high pressure led to the formation of the high level duct extending from Brittany towards the Pyrenees. Since it is a considerable distance from IO76 to the Brittany area it is also possible there was some surface duct coupling down the Irish Sea. From the Pyrenees the high level duct would probably have been visible. **Figure 1** shows the temperature inversion between about 1000m and 1500m altitude. Although similar high level ducts have been reported over the Brittany area many times previously, coupling into the Irish Sea surface duct may be a much rarer occurrence. Or not.

NEW ALPINE BEACON. This leads us nicely to an item about a new beacon on the Swiss Alps. Dominique, HB9BBD, has re-established his 10GHz band beacon on Rigi Scheidegg in the Swiss Alps, locator JN47GA, at 1662m ASL. It is transmitting the callsign HB9BBD/P on 10.368.063GHz. The power is 400W EIRP using a 15 slot waveguide antenna. The beacon began operation on 6 July. **Photo 1** shows the view from the beacon antenna. Unfortunately the mountain peak on the background is in the direction of the UK, but otherwise the location looks absolutely great.

PHOTO 1: View from the antenna of the HB9BBD/P 10GHz beacon, 1662m ASL in JN47. Photo: HB9BBD.

Also located with the 10GHz beacon are two other beacons, one on 23cm and one on 13cm. **Photo 2** shows René, HB9MPU, checking the 10GHz beacon. The 23cm beacon is in the middle and the 13cm beacon is on the right.

13cm BAND RESTRICTIONS IN SWEDEN. The revised list of licence exempt frequency bands (including amateur radio bands) issued by the Swedish P&T came into effect on 1 October 2012. From this date the Swedish 13cm band allocation is officially only 2400-2450MHz, with a general power limit of 100mW. The whole section from 2304 to 2400MHz has been lost to commercial interests. Those with high power permits for the lower section are able to continue using this segment until the end of 2012.

I am sure our enterprising Swedish friends will find a way around this problem and we will be able to work them on '13cm' long after 2013 comes around.

13cm CROSS BAND. One of the 'features' of the 13cm EME band is that it is not truly common to all regions and countries. Amateurs in some countries are only able to transmit around 2301.75MHz, with others at 2304MHz, 2320MHz and 2424MHz, due to local licensing restrictions. This means that participants must be able to receive four different sub bands of the amateur 13cm band. There are a number of relatively easy ways to do this and I have briefly mentioned them in this column on previous occasions. The technology to receive split band is not the problem, but rather the degree of coordination required to ensure that the QSO partner is listening in the right place, at the right time, to receive you. In spite of this little problem 13cm band EME operators have developed the techniques and skills to make these contacts, as the following reports show.

EME EXPEDITIONS. Two recent EME expeditions were reported. Bodo, DF8DX (DL3OCH), was active from Crete (SV9) on 23cm whilst Hermann, DL2NUD and Peter, DJ4TC operated as MJ/DL2NUD and MU/DL2NUD from Jersey and Guernsey on both

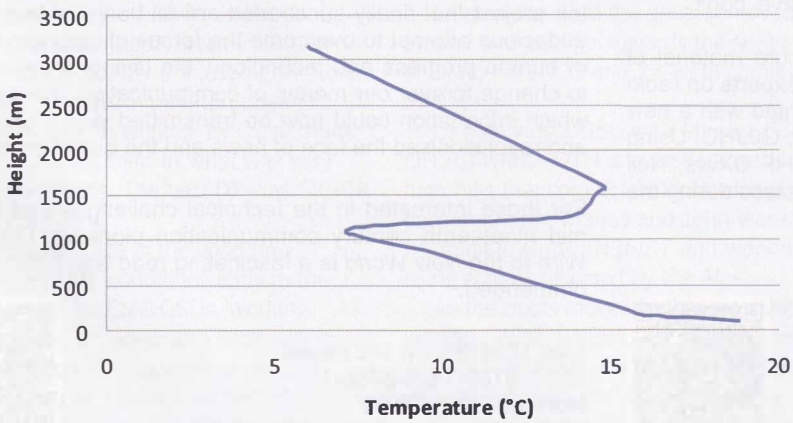

FIGURE 1: This chart shows the depth of the temperature inversion over Brittany that was probably responsible for the outstanding propagation from GM to southern France on 15 September that led to the new UK 10GHz band distance record.

70cm and 23cm.

Herman and Peter were active from 1 – 9 October. They used a dual band 432/1296MHz long Yagi and a Kenwood TS-2000X with power amplifier. **Photo 3** shows Peter, operating as MU/DJ4TC, from Guernsey. Zdenek, OK1DFC, has a report on his web page **[2]**.

Down in the Mediterranean Bodo, operating as SV9/DF8DX, used his well-known 23cm band 59-ele long Yagi to work OK1KIR, I1NDP, HB9Q, PA3CSG, OK2DL, G4CCH, DJ9YW, JA6AHB, OK1CS, UA3PTW and K2UYH. I believe all QSOs were on JT65C.

Each autumn (Fall?) the ARRL sponsors a multiband EME contest **[3]**. The 50 to 1296MHz bands event will take place on both the 3/4 November and 1/2 December weekends whilst the single-weekend 2.3GHz and up event took place on the weekend of 6/7 October.

From the reports received it would seem that activity levels were quite high during the October event and participants enjoyed themselves, with lots of contacts being made on all bands to at least 3cm.

The first contest report is from Peter, G3LTF, who used 13, 9 and 6cm to work a large number of stations off the moon. On 13cm, on 6 October, he worked JA4BLC*, PA3FXB, S59DCD, SM4IVE, Y02BCT, OH2DG, OH1LRY, ON5TA, R3YA, SP6OPN, SV1BTR, LZ1DX, SD3F, OK1KIR, DF3RU, OZ4MM, SM3BYA, IK3COJ, K5GW, DL9NEA,# NA4N*, K1JT*, WD5AGO*, PA3DZL, HB9Q, DL1YMK, WA6PY*, ES5PC, and VE6TA. (* denotes worked 13cm in-band, cross-band). On 7 October he continued with CT1DMK, PA7JB, G4RGK, 9A5AA, SM2CEW. G4BAO was an incomplete QSO. CWNR (called with no reply) were OK1CA, SM6CKU, WB5AFY*, WA8RJF*. Also heard on 2304MHz only, so couldn't call them, were PA0BAT, SV3AAF and F5JWF. He heard JA8ERE on 2424MHz for a total of 34 stations worked with his 6m dish and 230W from an ex 3G solid state power amplifier.

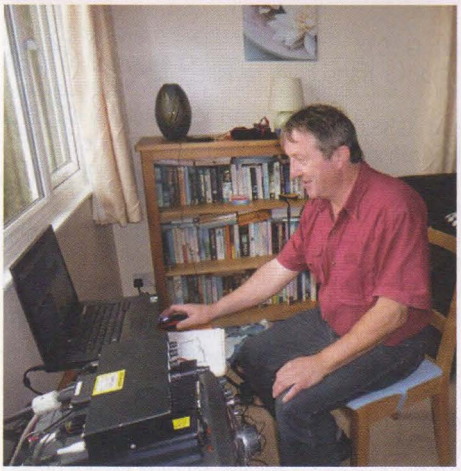

PHOTO 3: Peter, MU/DJ4TC operating on 23cm EME from Guernsey. Photo: OK1DFC.

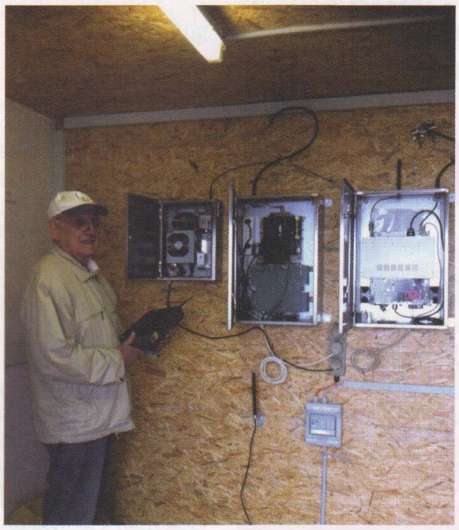

PHOTO 2: René, HB9MPU, with the new Swiss 10GHz beacon HB9BBD/P and the existing 23 and 13cm beacons. Photo: HB9BBD.

On 9cm (3400MHz) Peter worked K5GW on the 6th and on 7th he worked PY1KK and G4CCH for a total of 3 on this band. The power output was 28W to the same 6m dish.

Moving to 6cm (5760MHz) he worked SV1BTR, OK1KIR, ES5PC, OK1CA and SQ6OPG on the 6th. On the 7th he worked OH2DG, K1JT # (new initial), DL7YC and VK3NX. CWNR were JA1WQF and JA8ERE. Heard was SG6W for a total 9 on 9cm. Peter used 22W to his (now under-illuminated) 6m dish, which had an effective diameter of just 4.5m on this band.

Jac, PA3DZL, worked SM4IVE on 13cm on the first day of the contest for #63. On the second day he worked PA3FXB, F5JWF, SD3F, CT1DMK, OK1CA and LA8LF for a total of 26 QSOs on the 13cm band. After the contest he worked SM3BYA for # 64 and G4BAO for # 65.

Eric, ON5TA, commented that there was nice activity on 13cm during the ARRL Contest and he made 33 random QSOs despite very high degradation. He worked R3YA for the first QSO between ON and Russia on 13cm. Interference levels were, as always, terrible on 2424MHz but Eric says JA4BLC had a strong signal and could be contacted after he found the right combination of noise blanker and filtering.

Gerald, K5GW, in Texas mentions that Murphy struck on the Saturday, causing the 3cm (10GHz) transverter to die. He was looking forward to operating a new band in the contest so that was a big disappointment.

His totals were 38 QSOs and 33 multipliers on the 13, 9 and 6cm bands, which is about 25% better than last year, after the first weekend.

Over the next twelve months he plans to implement a multiple feed and band switching arrangement for 13, 9 and 6cm to eliminate those middle of the night feed/equipment swaps. A separate antenna for 3cm will complete the quick band changing goal.

From Phil, VK4CDI in Toowoomba, QL, we hear that he has finally got his 9cm gear operational – in time for the ARRL contest. His sked with K5GW produced an easy QSO for his first ever 9cm contact. (He hasn't even had a terrestrial QSO yet!). He called G4CCH later that day, but they failed to make a QSO. At this stage Phil felt he may have had an intermittent receive problem, or maybe it was the strong winds disturbing something.

Several other problems also need his attention, mainly tightening up the tracking, optimising feed position, and more power. He has a GaN (Gallium Nitride) 55W part on the way. The problems he encountered are common when starting out on a new EME band. We have all been there!

Phil currently runs a 3.6m dish, septum polariser feed with choke, G4DDK VLNA, 16W Toshiba PA and a VK3 transverter, all mounted on the feed.

ARI EME CW/SSB CONTEST. The Italian CW and SSB all-bands 144MHz to 10GHz contest was held on 29 and 30 September. Andrea, IK5QLO, found fairly good activity and conditions despite bad weather for the ARI CW/SSB contest on 23cm. He was happy to see an increased number of Italian stations on 23cm compared with previous years, even if some weren't aware there was a CW contest that weekend. He managed to work 17 stations with 17 multipliers for his best ever score in the ARI contest.

Nando, I1NDP, completed 32 QSOs (1 duplicated) but said this was nothing compared to what he expected to do in the ARRL contest. Unfortunately I did not see a report from Nando for the ARRL contest, so I don't know if this statement came true for him, or not.

SIGN OFF. This is my last GHz Bands column. After more than eight years I am handing on the baton to a new conductor. I hope that you found my mix of activity news, meeting reports and technical features interesting and maybe even informative. The new conductor will no doubt bring his own style to the column.

I would like to thank all those who submitted activity reports (whether they knew it or not!) over the last eight years. Without those reports there would be no permanent record of UK amateur microwave radio activity in the RSGB.

73 de Sam.

WEBSEARCH

[1] Radiosonde – http://weather.uwyo.edu
[2] OK1DFC – www.ok1dfc.com/Peditions/gugj/gjgu.htm
[3] ARRL EME contest – www.arrl.org/eme-contest

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Power max (25A) £89.95
Power max (45) £129.99
Power max (65) £229.99
W-5A 5A (7A max) linear £36.99
W-10A 25A (10A linear) £59.95
W-25AM (25A linear) £119.99

ACCS

MFJ-269 ANALYSER

1.8-170MHz + 70cm
£339.99

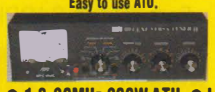
MFJ-259B ANALYSER

1.8-170MHz
£249.99

Case 259B £29.99 Dip Coils 259/269 £29.99 Case 269B £29.99
MFJ-269 pro version £359.99
MFJ-260C 300W dummy load £49.99
MFJ-901B ATU £109.99
MFJ-969 Rollercoaster ATU (300W) £209.99
MFJ-9620 1.5kW (metered) antenna tuner ..... our price £279.99
MFJ-994B (600W) intelli tuner ..... Sale £289.99

MFJ-993B INTELLITUNER

Fully automatic (1.8-30MHz). 300W SSB.
£249.99
Easy to use ATU.

MFJ-949E

£179.99
● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun + dummy load.

SGC SALE

SGC MAC-200 ..... sale £239.99
SGC-239 ..... £199.99
SGC-237 ..... £309.99
SGC-230 ..... sale £429.99
SGC-Smart lock £69.99

WONDER WAND

1.8-450MHz BNC. Whip supplied. Ideal for FT-817. Optional desk stand + 5m patch £24.99
£129.99

GIZMOS

WOUXUN KG-UV920R

NEW 2m/70cm.
FREE POST
NOW IN STOCK **£229.95**

WOUXUN HANDIES
all include battery, charger and antenna
KG-UV6D "Pro Pack" ..... £139.99 (Incl's 2m/70cm handie + spare batt's, mic, case, s/ware & more)
KG-UV 6D radio + batt £94.99
KG-UVDIP 2m/70cm ... sale £79.99
UV DIP/L 2m/4m handie £99.99
USB lead + S/W £21.00
Speaker mic £15.99
Spare battery £19.99

New UV-6D 2m/70cm £94.99

YAESU FT-270

2m/5W handie. Incl's battery pack, mains charger, etc.
£109.99

ALINCO DJ-596E

2m + 70cm Handie. Includes nickle metal N.M.H.I and charger.
Includes free speaker mic
£119.99

NEW YAESU VR-160

100kHz-1300MHz "Micro" handie. Includes battery, and charger. AM/FM/WFM.
£199.99

VR-120D

100kHz-1300MHz. AM/FM/WFM.
£139.99

NEW SANGEAN ATS-909X

The ultimate all-mode portable shortwave + FM (76-108). Fully loaded portable with improved Rx thanks to a "dsp" tuner. Includes PSU, antenna, case, etc.
£249.99 Del £10

SUPER-GAINER RH-9000 (BNC)

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2.9GHz). IDEAL FOR AIRBAND

£32.99 P&P £5.00

SUPER-GAINER RH-9090 (SMA)

SMA 40cm flexible whip that is ideal as replacement. IDEAL FOR AIRBAND (Rx:- 25MHz-2.9GHz)

£36.99 P&P £5.00 SMA fitting

HEAVY DUTY 30ft SWAGED MAST SET

5 sections, 2 inch x 6 foot long. Very heavy duty.

★ STAR BUY ★ **£84.99 PER SET** (delivery £15)

TWO SETS FOR £120.00 while stocks last (delivery £18)

NEW SWAGED MAST SETS

24 foot mast. 1½" – 4 sections (6ft long).
£49.99 OR 2 SETS £84.99
SALE:- 3 SETS £99.99

24 foot mast. 1¼" – 4 sections (6ft long).
£46.99 OR 2 SETS £78.99
SALE:- 3 SETS £95.00

H/DUTY CAR BOOT MAST SET

15 foot (5 x 3ft sections) slot together. 2 inch O/D 15ft
£44.99

18 foot (6 x 3ft sections) slot together. 1.5 inch O/D 18ft
£42.99

ANY TWO SETS £70.00

NEW CAR BOOT MAST SET

Superb 18 foot (6 x 3 foot sections) that slot together.
Dia: 1¼" ideal to take anywhere. **£39.99**

2 for £70.00 3 sets £80.00

HEAVY DUTY 24ft SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 6 foot that slot together. **£79.99 PER SET**

TWO SETS FOR £140.00 SALE: THREE SETS FOR £159.99

10m PNEUMATIC MAST

10m MAST, ONLY
£1199.99 Del £40

NEW NOISE FILTER!

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

2 for £16.99 / 5 for £36.99 (P&P £5.00)

6mm SNAP FERRITES NOW IN STOCK. 2 for £14.99, 5 for £30. P&P £5.00

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling.
(Fits up to 2" mast) **£14.99** + P&P £5.00
30m pack (4.4mm) nylon guy rope £15.00
Special: 3 Pulley's £37.50 post £6.00

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).
£14.99 + P&P £5.00
Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on WALL BRACKET £2.99 P&P £1.00

30m pack (4.4mm) nylon guy (480kg)..... £15.00
132m (4.4mm) nylon guy (480Kg)..... £45.00

HANGING PULLEY

Heavy duty die-cast hanging pulley. Hook and go!
£26.99

BARGAIN WINCH

500kg brake winch. BARGAIN PRICE
£94.99 Del £10.00
(Now includes cable grip)
Winch wall bracket..... £22.99

LOW LOSS PATCH LEADS

£4.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£13.99
PL-259 - PL-259	1m	£16.99
PL-259 - PL-259	4m	£24.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£16.99

Q-TEK TRI-MAGMOUNT

Very heavy duty. Available:- SO-259 or 3/8 – specify..... **£44.99**

RH-999 (new)

Tx: 50/144/430/1200MHz. 8NC (plus SMA adapter). 51cm long. Rx: 40-1200MHz.
NEW **£89.99** post £5

RH-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.
£59.99
P&P £5.00

TONNA YAGIS

22089	9ele 2m	£79.99
220811	11ele 2m	£109.99
220817	17 ele 2m	£139.95
220818	9ele 2m XD	£129.95
220921	21ele 70cm	£109.00
220089	9ele 2m (portable)	£86.99

CUSHCRAFT BARGAINS

MA5B Mini beam 10/12/15/17/20m	£519.99
A3S 3 ele yagi (10-20m)	£599.99
A4S 4 ele yagi (10 - 20m)	£675.00
R-8E 40 - 6m verticle	£525.00

BUTTERNUT VERTICALS

HF-2V (80/40m)	£279.99
HF-6V (80/40/30/20/15 /10m)	£375.00
HF-9V (as HF-6V + 17/12 & 6m)	£425.00

G5RV's

Half size 40-10m	£32.99
Full size 80-10m	£36.99
Half size Deluxe	£44.99
Full size Deluxe	£59.99
in-line choke balun for G5RV, etc.	£39.99
Replacement dipole centres	£9.99

AR303

Quality rotator for VHF/UHF. Superb for most VHF-UHF Yagis, 3-core cable required. 3-core cable £1 per mtr. GS-050 stay bearing £39.99
OUR PRICE **£99.99**

DIAMOND YAGIS

No tuning required

2m/5 element	No tuning required	SO-239 feed	£47.99
2m/10 element	No tuning required	SO-239 feed	£82.99
70cms/10 element	No tuning required	SO-239 feed	£52.99
70cms/15 element	No tuning required	SO-239 feed	£69.99
6m/2 element	No tuning required	SO-239 feed	£94.99

DIAMOND V-2000

6m + 2m + 70cm. 2 section (2.5m long) PL-259 fitting. Superb quality.
Our price **£124.99**

Q-TEK COLLINEARS (VHF/UHF)

Del £10.00

X-30 GF 144/430MHz, 3/6dB (1.1m)	£49.99
X-50 GF 144/430MHz, 4.5/7.2dB (1.7m)	£64.99
X-300 GF 144/430MHz, 6.5/9dB (3m)	£89.99
X-510H GF 144/430MHz, 8.5/11dB (5.4m)	£149.99
X-627 GF 50/144/430MHz	£99.99

DUPLEXERS & TRIPLEXERS

MX-2000 50/144/430MHz Triplexer	£84.99
TSA-6011 144/430/1200MHz Triplexer	£84.99
MX-72 144/430MHz	£39.99
MX-72 "N" 144/430	£42.99
MX-62M (1.8-56MHz + 76-470MHz)	£79.99
MX-610 1.8-30MHz + 49-470MHz (S-239 conn's)	£99.99

MOBILE ANTENNAS

Del £10.00

D8-7900 2m/70cm (5.5/7.2d8) 1.6m (PL-259)	£44.99
D8-770M 2m/70cm (3.5/5.5dB) 1m (PL-259)	£24.99
Diamond CR-8900 10/6/2m/70cm (1.26m)	£99.99
Diamond AZ-506 2m/70cm – only 0.67m long	£39.99
PL-62M 6m/2m (1.4m) PL-259	£23.99
PL-627 6m/2m/70cm (1.7m) PL-259	£44.99

DOUBLE THICK FERRITE RINGS

A superb quality ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £16.99 P&P £5.00
12 for £26.99 P&P £5.00
20 for £40.00 P&P £10.50

COPPER ANTENNA WIRE ETC

Hard drawn (50m roll)	£29.99 P&P £7.50
Enamelled copper wire (50m x 16 guage)	£24.99 P&P £7.50
Flexweave (H/duty 50m)	£44.99 P&P £7.50
Flexweave (H/duty 18m)	£21.99 P&P £7.50
Flexweave (PVC coated 18m)	£24.99 P&P £7.50
Flexweave (PVC coated 50m)	£59.99 P&P £7.50
Special 200mtr roll PVC coated flexweave	£180.00 P&P £10.00
Copper plated earth rod (4ft) + wire clamp	£16.99 P&P £8.00
Copper plated earth rod (4ft) as above + wire	£27.99 P&P £8.00
New RF grounding wire (18m pack) PVC coated	£24.99 P&P £5

METALWORK & BITS (Del Phone)

2 inch to1½" or 1¼" pole convertor (specify)	£26.99
2" mast-floor base plate	£19.99
6" stand off brackets (no U-bolts)	£8.99
9" stand off brackets (no U-bolts)	£10.99
12" T & K brackets (pair)	£24.99
18" T & K brackets (pair)	£28.99
24" T & K brackets (pair)	£32.99
36" T & K bracked (pair) galvanised	£46.99
U-bolts (1.5" or 2") each	£2.00
8mm screw bolt wall fixings	£1.70
8-nut universal clamp (2" to 2")	£9.99
2" extra long U-bolt/clamp	£7.49
2" crossover plate with U-bolts	£18.99
15" long (2") sleeve joiner (1.5" also available)	£19.99
3-way guy ring	£9.99
4-way guy ring	£12.99
Heavy duty guy kit (wire clamp, etc.)	£49.99
Set of 3 heavy duty fixing spikes (~0.7m long)	£29.99
30m pack (4.4m) 480kg B/F nylon guy	£15.00
Roll of self-amalgamating tape 25mm x 10mtr	£8.99

All our brackets are of high quality, British made and galvanised.

D-308B DELUXE DESK MIC

(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£24.99 each). Replacement foam windshield £3.00 + P&P.

8-pin modular plug converting to 8-pin round Yaesu adapter £24.99

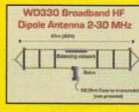
£99.99

COAX BARGAINS

True militaryspec real UKcoax

RG-58 Military spec x 100m.
£49.99 or 2 for £90.00
Coax stripping tool (for RG-58).....£8.99
RG-213 Military spec x 100m (10mm dia).
£149.99/100m or 2 for £260.00
WESTFLEX 103 (100m) £159.99

NEW DIAMOND WD-330



Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else. Japanees quality made product
WOW **£249.99**

NEW DIAMOND BB6W

2-30MHz (250W) 6.4m long. End-fed wire antenna. Icludes matching balun. Sling up & away you go.
BEST BUY **£209.99**

W-8010 DIAMOND SHORTENED DIPOLE

80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.
SALE **£139.99**

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).
SEND SAE FOR LEAFLET
£219.99
NEW Wire Penetrator 50ft long (1.8-70MHz)..... £189.99

CAROLINA WINDOM

CW-160S	(160-10m) 40m long	£175.99 P&P £10.00
CW-160	(160-10m) 80m long	£175.99 P&P £10.00
CW-80	(80-10m) 40m long	£150.99 P&P £10.00
CW-80S	(80-10m) 20m long	£150.99 P&P £10.00
CW-40	(40-10m) 20m long	£139.95 P&P £10.00

NEW DIAMOND HEAVY DUTY TRAPS (1.2kW)

SUPERB QUALITY ENCAPSULATED TRAPS

80m (pair)	£59.99
40m (pair)	£54.99
20m (pair)	£49.99

Q-TEK BALUNS & TRAPS

Baluns 1:1 or 4:1 or 6:1 ..... £39.99 each P&P £5
Traps 80m or 40m or 20m or 15m ..... £39.99 pair P&P £5

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W) ..... £79.95 P&P £6.50
RS-102 1.8-150MHz (200W) ..... £59.95 P&P £6.50
RS-402 125-525MHz (200W) ..... £59.95 P&P £6.50
TM-3000 1.8-60MHz (3kW) incls mod meter ..... £69.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR ..... £34.99 P&P £5
DL-30 diamond dummy load (100W max) ..... £29.99 P&P £5

GENUINE COAX SWITCHES (P&P £6.00)

2 way CX-201 (0-1GHz) SO239	£26.99
2 way CX-201 'N' (0-1GHz) 'N'	£32.99
4 way CX-401 (0-500MHz) SO239	£79.95
4 way CX-401 'N' (0-500MHz) 'N'	£89.95

WATSON COAX SWITCHES

(POST £6.00)

CX-SW4N DC-1.5GHz (5xN)	£69.99
CX-SW4PL DC-800MHz (5 x SO-239)	£59.95
CX-SW3N DC-1.5GHz (4 x N)	£49.95
CX-SW3PL DC-800MHz (4 x SO-239)	£45.95
CX-SW2N DC-3GHz (3 x N)	£32.95
CX-SW2PL DC-1GHz (3 x SO-239)	£26.95

YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round)	£44.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-round)	£39.99 P&P £5
MH-31A8J 8 pin modular	£39.99 P&P £5
MH-48 A6J 8-pin modular (DTMF)	£59.99 P&P £5

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF	£22.00 P&P £4
DC-2 Standard 2-pin/15A fits most VHF/UHF	£10.00 P&P £4
DC-3 Fits Yaesu FT-7800/8800/8900, etc	£17.50 P&P £4
DC-4 Fits new Yaesu FT-950/450, etc	£22.99 P&P £4

LDG FT METER

External analouge meter for Yaesu FT-857/FT-897 (includes connection lead).
£44.99 (Post £5)

Sport Radio

The RSGB Convention Contesting Forum and a reason not to watch TV at Christmas

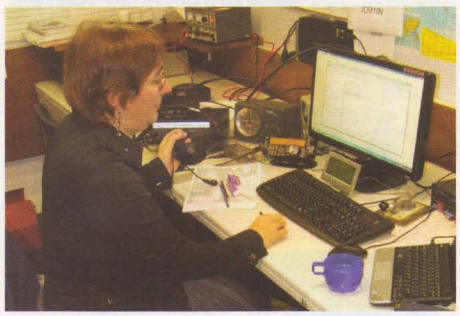


PHOTO 1: G8NVI in the Christmas Cumulatives 2011

CONTESTING FORUM. With contesters in general known for their forthright opinions, I thought there might be some fireworks at the Contesting Forum held at the RSGB Convention, in October, but on the day it was all very civil. Ed Taylor, GW3SQX, the Contest Committee Chairman opened the proceedings with the following list of statements/topics:

1. That the General Rules would remain basically the same for 2013, with main changes in 2014.
2. The CW NFD survey.
3. The M6 multiplier suggestion for the UKACs.
4. The possibility of an 'easier to enter' section in VHF NFD.
5. 80m Club Championships – no General/Local rule changes proposed.
6. No Centenary contest, but Centenary versions of IOTA and VHF NFD.
7. The proposed replacement for the 21/28MHz Contest.

He then took a list of topics from the floor that that people wanted to discuss. The forum went thus...

Membership: MOVFC thought it unreasonable that new amateurs couldn't even get a taste of contesting without joining the RSGB. GW3SQX clarified that it used to be the case that you had to be a Member to enter any RSGB event, but now that's been relaxed so that in club contests you don't have to be. He posed the question of whether it would be legitimate to allow non members to enter all RSGB contests, adding "Where do you draw the line?"

Power Levels in 80m CCs: G4ARI wanted 5W for QRP, not 10W, the accepted QRP limit being 5W for CW and 10W for SSB.

Sweeper section in VHF NFD: GW8ASD asked for clarification of what is meant by soliciting a QSO. From the Committee, GOFCT clarified that CQ was effectively the same as QRZ and is already in the rules.

How to encourage sweepers to go portable (see 4 above)? The 'simple station' option (with one radio) was aired. Although it might dilute existing sections, the idea was approved of by those present.

Results: GW8ASD liked the speed of results and presentation but would like more statistics to be available. He was informed that they now are.

80m CC sections: M1EYP would like his group (Tall Trees CG) to go in Local section, but as they are a CG they've been told they must be in the General section. He wanted to know why. There was an appeal from Norfolk ARC that 35 miles would be a better cut-off between Local and General, as it's a rural county.

21/28MHz Contest: GM3WOJ spoke in favour of the proposed replacement. GW3SQX asked for any other views. G3SXW said it would need lots of marketing. G4PIQ liked idea of a multi band format, but questioned whether we need another 'everyone works everyone' contest? An alternative proposal was for a contest within a contest, such as CQWW. G3SVL acknowledged the point about getting more UK amateurs into contesting or raising the RSGB contesting profile. GW3SQX said that the CC would have to manage it if it were RSGB badged. GM3WOJ replied, saying that the new contest would have an associated awards scheme for working UK postcode districts. G3XTT said he liked the idea of an EU-wide contest, to which G3ZVW suggested RSGB take over the ailing EU Sprints. GW3SQX reported that the EU Sprint organisers were apparently getting their act together again. GM3POI spoke about holding a frequency all the time. G4FAL wanted to keep the 21/28MHz going while sunspots were good. G3XTT said there was a need to include the results of UK stations in *RadCom*. GM3POI called for a vote on the subject. The majority present were in favour.

Disqualification: G3TXF asked for more information about a recently reported disqualification. Without naming the individual, GW3SQX explained why.

Short Contest Calls: G3YBY/F5VKT wanted clarification about which events they are permitted in, and why. GW3SQX gave it. More next month.

THE ANTIDOTE TO CHRISTMAS. In terms of their timing, duration and numbers of bands active all at once, the Christmas Cumulatives are unique in the VHF Calendar. Ann Stevens, G8NVI **(Photo 1)** and her husband Mike, G8CUL **(Photo 2)** romped to victory in it last year. As Ann says, "Their proximity to Christmas may put some off, but for those not sleeping off excess pudding or visiting Great Aunty Flo they are the perfect antidote to the Christmas season. This contest encourages us to dust off 2m, 4m, 6m and 70cm, preferably all at once for a 4-day, 2-hour frenzy of band hopping and QSYing. And if you don't get it right on the first day, you have another three in which to hone your skills. RoPoCo and the 80m Sprints pale into insignificance compared to the complexity of running multiple bands, sometimes after a liquid lunch!

"Many VHF/UHF contesters will know me better as 'Mrs G8CUL', or at least the higher voice that comes on for the last half of the Tuesday night UKACs. Between 2006 and 2010 I had entered the Single Operator Fixed Section of the Christmas Cumulatives with varying degrees of success. Four bands, three rigs, two pairs of headphones, two microphones and four computer logs made for complex operating, with the OM watching in admiration as I QSYed from band to band, sometimes even arriving at the correct agreed frequency! As keen contesters Mike and I are always looking for ways to improve our performance and entering the 2011 Open section seemed to be the way forward, plus it would keep us both out of the family's way. The restricted room in the CUL/NVI shack has previously led to matrimonial strife, so to try to avoid the divorce courts we decided to seek permission to use the Rutherford Appleton Laboratory ARS clubroom that Harwell ARS (our local club) are currently sharing.

"The two-roomed RAL shack is fortunate in having two masts **(Photo 3)**, one with

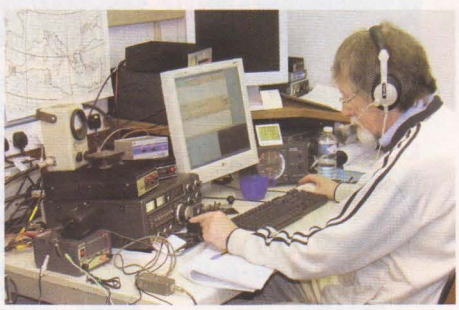


PHOTO 2: G8CUL in the Christmas Cumulatives 2011.

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Dec 2	144MHz AFS §	0900-1700	All	144	RS(T) + SN + Locator
Dec 4	144MHz UKAC	2000-2230	All	144	RS(T) + SN + Locator
Dec 11	432MHz UKAC	2000-2230	All	432	RS(T) + SN + Locator
Dec 18	1.3GHz UKAC	2000-2230	All	1.3	RS(T) + SN + Locator
Dec 26-29	Christmas Cumulatives	1400-1600	All	50-432	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Nov 30 - Dec 2	ARRL 160m	2200-1600	CW	1.8	RST (Ws & VEs also send ARRL/RAC section)
Dec 8-9	ARRL 10m	0000-2359	CW, phone	28	RS(T) + SN (Ws, VEs & XEs send State/Province code)
Dec 26	DARC Christmas Contest	0830-1100	CW, SSB	3.5-7	RS(T) + SN (DLs send DOK or 'NM')
Dec 29	RAC Canada Winter Contest	0000-2359	CW, phone	1.8-144	RS(T) + SN (VEs send Province code)

Italics indicate that only provisional information was available.
* HF Championship event. + VHF Championship event. § Super League event.
For all the latest RSGB contest information and results, visit www.rsgbcc.org

2m and 70cm aerials with their coaxes terminating in one room, and one with HF and 6m beams with their coaxes terminating in the other. For the 2011 contests we temporarily replaced the HF beam with a borrowed 4m one, so the division of labour in the shack was obvious.

"On 2m and 70cm we used the club's FT-726 with a 180W PA on 2m and a 40W PA on 70cm. On 4m we used a borrowed FT-847 with a 100W PA and the club's TS-480 running 100W on 6m. We use headsets with boom microphones and footswitches. Each room has a computer on which we utilised Minos software for the log. The OM (Mike, G8CUL) produced some software so that we could type messages to one another during the contest, although we still seemed to shout and wave at one another on a regular basis through the glass partition between the rooms.

"As each operator controlled two bands, we swapped each day so that we had an equal exposure on all bands. I would recommend this way of working. It was great fun and meant we could maximise our time on all four bands. Matrimonial harmony was maintained, although, unlike in the UKACs where 'he' starts and 'she' mops up the DX and extra multipliers, this was direct competition – each trying to outdo the other's score from the previous day. No love lost here!

"It is not necessary to enter on all bands, indeed many use the Cumulatives to square and country collect on just one or two bands. The rules do not require you to enter on all four bands, but that is the general idea behind these Cumulative Contests and it does seem a little ironic that stations are able to come well up the results table running two or three bands, to the detriment of those who have gone to the trouble of running all four. We haven't come up with an answer to this one yet.

"In 2011 over the four days we worked a daily average of 22 stations on 6m, 12 stations on 4m, 43 stations on 2m and 16 stations on 70cm.

"Would we do it again? Yes, it's the Open Section for us again this year. And what changes will we be making to our station? Wait and see!"

PHOTO 3: Antennas at the Rutherford Appleton Laboratory ARS.

THIS MONTH'S EVENTS. As usual there are no RSGB HF events this month. VHF is a different matter though. The first of this month's contests is 2m AFS. It's the third event in this season's Super League series and takes place on Sunday 2nd. In 2010 the participation in this contest was at a ten-year high of 127, but last year the number dropped back to 113, with several participants (especially portable stations) commenting that they felt the duration of the event was a little too long. A few people caught some good conditions, but for most it was flat. The next three events are UKACs; 2m on the 4th, 70cm on the 11th and 23cm on the 18th. Because Christmas Day falls on a Tuesday this year, there will be no 50MHz or UHF UKACs on the 25th. The final VHF event of the year is the Christmas Cumulatives, which take place on 6m-70cm on 26-29th (all four bands on all four days). To do well you'll need to be agile and alert, because to work as many as you can in two hours you need to keep hopping between bands.

Starting two hours before 1 December, the ARRL 160m Contest runs for 42 hours. Work the USA, US Territories and Canada only in this CW event. The rules say "the segment 1830 to 1835 should be used for Intercontinental QSOs only". To me this suggests that whilst there is no reason why you may not make contest QSOs outside of this segment, other frequencies may be noisier at the North American end of the QSO because of contacts taking place within the continent. For the entire 48 hours of 8-9th we have the ARRL 10m Contest. In this CW/Phone event everyone works everyone. Both ARRL events have numerous entry categories, so please check the rules online to find an appropriate one for yourself. The DARC (German National Society) Christmas Contest takes place for 2½ hours on Boxing Day morning. All entry categories are single-op, but the options are then low/high power and CW-only or mixed mode. It is a sprint event in which the DLs get multipliers for working different prefixes, so they will certainly be on the lookout for non-domestic QSOs. Non-DL to non-DL QSOs are valid, so for UK stations there's no need to concentrate on working Germany. As far as taking part from the UK is concerned, I expect 40m will be where most of the action is, because DL is a bit far for daylight QSOs on 80m – for most of us anyway. And finally... the RAC Canada Winter Contest takes place for the whole of the 29th. With numerous entry categories, everyone can work everyone, but concentrate on working Canadians because Canadian Provinces and Territories are where the multipliers are. With certificates on offer to the winner of each category in each DXCC entity (and only a few entries from the UK last year), this event is well worthy a festive Wallpaper Alert.

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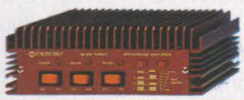

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HF F-Layer Propagation Predictions for Decmber 2012

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	785....67787	878...288888	..5644796...	...88898....	...99998....	...8999.....	....999.....	....998.....
*** Asia								
Yakutsk	4333	7452..467767	6..777488534	...87.....	.....	.....	.....	.....
Tokyo	.......3323.	...67467766.	...34.....	.....	.....	.....	.....	.....
Singapore	.......2222.	787665	......66....	......75....	.....684....	.....67.....	.....66.....	.....
Hyderabad	.....	34333	.......65...	......56....	......65....	......6.....	.....45.....	.....45.....
Tel Aviv	884....17888	989....99999	.......87...	...6..67....	...88898....	...68896....	....999.....	....888.....
*** Oceania								
Wellington	.....	....5666....	....7776....	....6774....	....466.....	.....5.....	.....64.....	.....
Well (ZL) (LP)	.....	.....	.....	.....	.....	.....	.....	.....
Perth	.....	.......53...	......886...	......87....	......6.....	......5.....	.....	.....
Sydney	.....	.....68752..	....78972...	....8985....	....676.....	....66.....	.....5.....	.....
Melbourne (LP)	.....	...67.....	..399.....	.4.89.....	....96.....	....96.....	....8.....	.....
Honolulu	.....	.......3....	...345362...	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....	.....	.....	.....	.....
W. Samoa	.....	...37567....	....8888....	....7887....	....6886....	.....77.....	.....6.....	.....
*** Africa								
Mauritius	2........112	7......57767	5.....87645	.......86...	.......5....	.....	.....	.....
Johanesburg	.....	4........344	73.....7777	.......575..	.......65...	.......6....	.......5....	.....
Ibadan	.....	676.....5666	777.....7767	3..4...387..	...733468...	...766676...	...77777....	...57778....
Nairobi	2........111	87......7888	64.....26655	.......66...	.......6....	...4..56....	...66677....	...64674....
Canary Isles	666.....3556	7776....7878	8838...28888	...66557884.	....888967..	....8998....	.....44.....	.....
*** S. America								
Buenos Aires	.....	23.6........	56.8......33	...7........	...3........	.....	.....	.....
Rio de Janeiro	.....	33.7.......2	56.9.....365	...8.....3..	...5........	....4.......	....4.......	.....
Lima	.....	23.5........	46.76.....23	...34.......	.....	.....	.....4.....	.....
Caracas	.....	4434......23	88.84....276	....7...36..	....56456...	.....7677...	.....877....	.....877....
*** N. America								
Guatemala	.....	33.3........	56.66......3	.....4.....	.....5.....	......5.....	......64....	......6.....
New Orleans	222.........	6666.......6	67.75......3	.....5.....	.....	.....	......55....	......55....
Washington	2232.......2	7777......77	67.76....575	.....6..55..	.....5..5...	......556...	......66....	......77....
Quebec	4452.....254	67.7.....776	....5...77..	....76357...	.....556....	......67....	......77....	......77....
Anchorage	.....	55.4...23223	74.5665774.5	........7...	.....	.....	.....	.....
Vancouver	.....	33.2........	3..........	.....	.......54...	.....	.....	.....
San Francisco	.....	33.22.......	.....	.....	.......5....	.......4....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.......5....	.......5....	.......5....	.......4....

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**. 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 January, February & March 2013 are respectively (SIDC classical method – Waldmeier's standard) 73, 75 & 75 and (combined method) 87, 89 & 90. The provisional mean sunspot number for October was 53.3. The daily maximum / minimum numbers were 83 on 15 October and 28 on 7 October.

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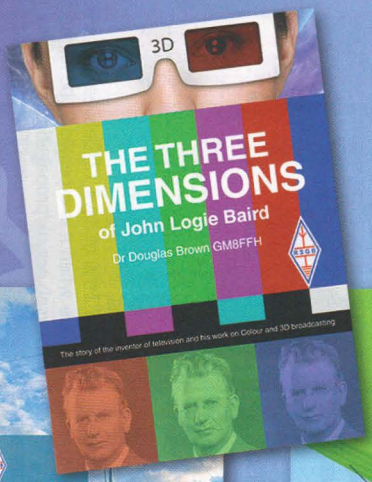

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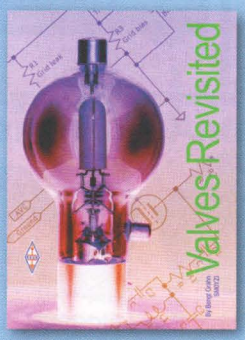

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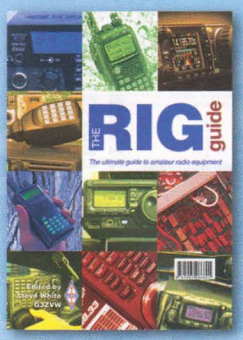

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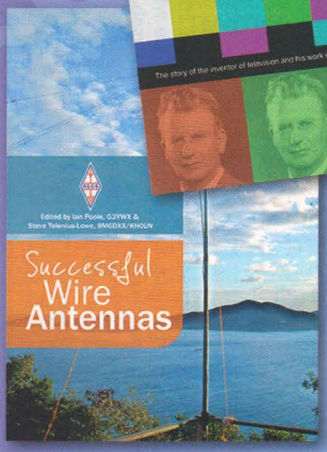

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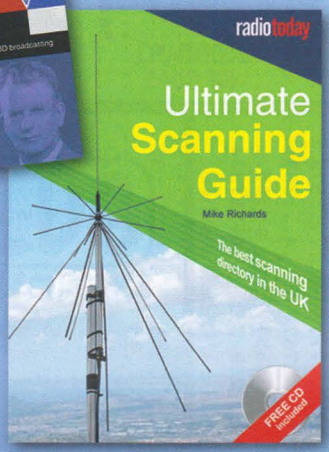

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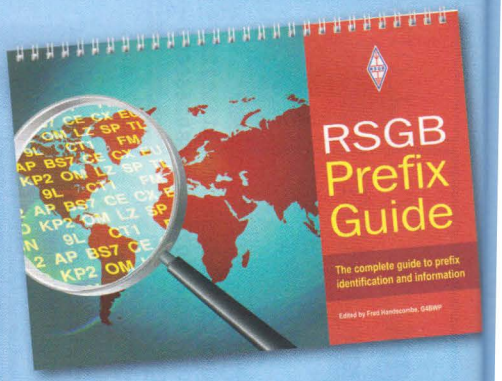

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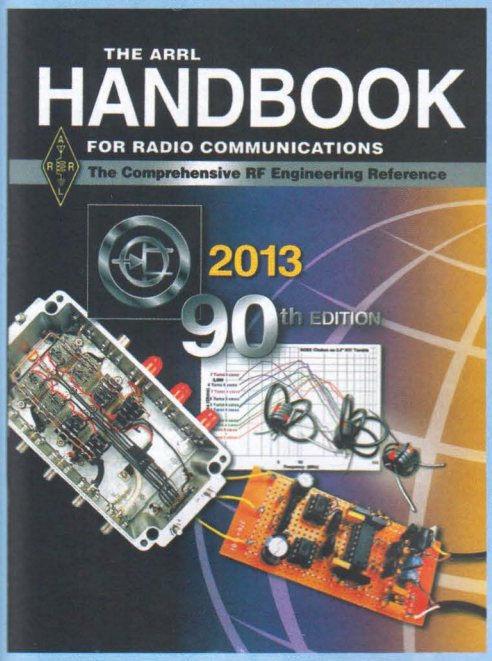

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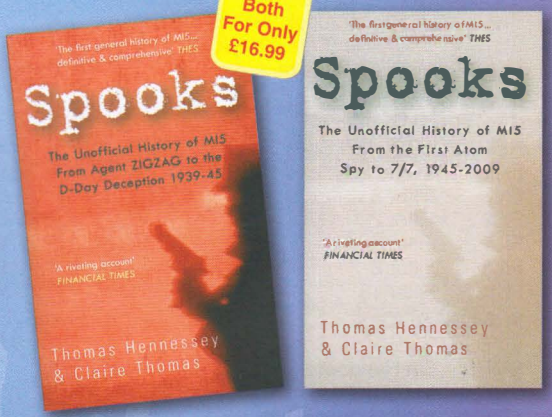

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C

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Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, 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. Please note that we don't normally print 'closed', 'TBA' or 'every Tuesday' type submissions. The deadline for the January 2013 *RadCom* is 26 November and for the February 2013 edition it's 21 December. For GB2RS,the deadline is 10am on the Thursday for the week of broadcast. If you need to amend your club details, please visit www.rsgb.org/clubupdates.

INTERNATIONAL

PAFOS RADIO CLUB, CYPRUS
Richard, 5B4AJG, 00357 97857891. 5B4AJG@cyprusliving.org
Meetings normally held on the 3rd Thursday, 7pm for 7.30pm at DTs Bar, Tomb of the Kings Road, Pafos, nr Lidl. Visitors welcome. Wednesday net at 7.30 on 145.750 (repeater), CTCSS 88.5.

Nobby Styles, G0VJG went to Monaco in October for a short radio break. Having gaining permission to operate he worked mobile using an FT-897 with 100W and mobile whips (loaned by Richard, G7LGW and Dave G3RGS) that worked very well. Using 3A/G0VJG he operated mainly from a high point near to the Prince's Palace of Monaco, which is situated on the border of France, close to a harbour. There were many pileups and 2626 QSOs were made: 235 on 80m, 555 on 40m, 499 on 20m, 472 on 17m, 252 on 15m, 298 on 12m and 315 on 10m.

The QSO breakdown was EU 80%, Asia 15%, Oceana 2% and Africa 1%. One QSL with Bob, W1DDD was a new DXCC for him and 21,000 miles long path. G0VJG would like to thank his QSL manager, Owen, G4DFI and Malcolm, F1VNR, Rob, F5VHN and their XYLs for their hospitality.

NATIONAL

Civil Service Amateur Radio Society holds a weekly net, which has operated without interruption for over thirty years. They meet every Tuesday evening at 8pm local time on 3.763MHz, everybody is welcome to join in.

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, RM1@RSGB.ORG.UK

Cockenzie & Port Seton ARC
Bob, GM4UYZ, 01875 811 723, www.cpsarc.com
7 Normal club night
8 Club Christmas night
Livingston & DARS
Norman, GM1CNH, 07740 946 192,
5 AGM
12 Operating evening
19 Club evening
Lothians RS
Alan J Masson, GM3PSP, 0131 623 4580, alanjmasson@virginmedia.com
12 Christmas curry night

Cockenzie & Port Seton Amateur Radio Club celebrated their latest Intermediate exam successes. Left to right you can see Gary Bourhill, MM0FZV (lead invigilator), Prof Jamie Davies, MM6JDV, Jonathan Hutchinson, MM6HCH, Thomas Mathieson, MM6TMN and Bob Glasgow, GM4UYZ (instructor).

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

No listings received

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

Bolton Wireless Club
boltonwireless@gmail.com
10 Open evening including table top/bring & buy sale
24 Closed
Chester & DRS
Bruce Sutherland, M0CVP, 01244 343 825
4 Talk by Alistair G3NHP
11 Committee meeting
18 Christmas social
26 Closed
Mid-Cheshire ARS
Peter Paul Fox, G8HAV, 01606 553 401
5 Raspberry Pi evening
12 Bring equipment for repair
19 Beer & stew evening
26 Closed
Morecambe Bay ARS
Sheila, 07867 516 836, sssmith456@btinternet.com
4 Members night
11 Discussion on how members became interested in ham radio
18, 25 Closed
South Manchester R&CC
Ron, G3SVW, 01619 693 999
6 Wonders of China part 3 by Dave, G4UGM
13 Members' QRP experiences, Bill, G4NOL
20 Christmas party & quiz
27 Closed
Workington & D AR&IT Group
Barry Easdon, G0RZI, 01946 812 092,
3 Club meeting and OTA
17 Christmas dinner
31 Closed

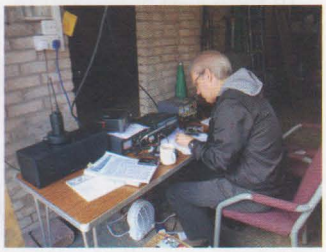
Pegasus Explorer Scouts and 1st Astley Scouts once again hosted JOTA for Lilford District Scouts at the Astley HQ in Manchester as GB1ASG. This was the biggest JOTA for many years with 10 Explorer Scouts, 37 Scouts, 15 Cubs and 1 Brownie joining in. They contacted stations on 80m, 40m, 20m, 2m and 70cm using voice, SSTV and D-Star. The furthest HF radio contact was by SSTV to Australia and the Scouts really enjoyed sending and receiving pictures from remote locations. The new RF earth system played dividends as no radios were reported to run 'hot' this year and they got much better signal reports than last year. The recently acquired Kenwood 2m / 70cm radio made a big difference as it meant a second VHF / UHF station this year. The Explorer Scouts ran many of the radio activities and also axe and saw training for the younger Scouts. A big thank you has to go out to all of the leaders within the District who gave up their time to help. An even bigger thank you goes to Andy, M1VIP and the members of the **West Manchester Radio Club**.

South Lancs ARC had a visit from the RSGB President, Dave Wilson, M0OBW. Members enjoyed his visit to the club's fifth special event of the year, even though the weather wasn't exactly the best for an outdoor event. The highlight of the event happened on Sunday morning when a junior member contacted Tazmania.

Members from left to right: Allan, 2E0RAG, Dave, M0NZR, Jason, G0IZR, Dave Wilson, M0OBW, Liam Layland and Stepanie Forber.

When JOTA station GB4DXS moved to Forest Camp, permission was obtained to use the old climbing tower to mount the aerials and give some height above the

trees. The site has gone on to install permanent aerials available for other operations all year round. Thanks to Dave, Guy, Nigel, Simon and others. The month before Mike and Chris installed a UHF/VHF collinear on the very top of the tower. A full size G5RV was donated by Waters & Stanton and this was mounted on the other side of the climbing tower. On the Friday afternoon of JOTA they were on the air with Alex from Dewa Explorer Scouts, Chester helping out. Conditions seemed to be very good with contacts made to Spain, Israel, Rome, Austria, Siberia, Morroco, USA and even St Helena. There was a great opening to the States on 10m, even picking up FM repeaters. Thanks go to Red, KOLUZ for his patience with Chloe, one of the Scouts from Chester, who was a bit quiet on the mic. Greg, G0DUB came down for a few hours to help operate the station and show the Scouts a bit of CW. David, G7GFC used a mobile radio and aerial for a temporary APRS station to advertise the location to the world and found other JOTA stations had done the same.



REGION 4: NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, GOUGE, RM4@RSGB.ORG.UK

Angel of the North ARC
Nancy Bone, G7UUR,
01914 770 036,
nancybone2001@yahoo.co.uk
3, 17 On the air
10 Christmas bazaar and junk sale
24, 31 Closed

Denby Dale RC
Richard, M0RBG,
07976 220 126,
m0rbg@talktalk.net
5 A technical look at early cinema photography
12 On the air from 1930 on 145.575MHz ±
19 Christmas party

Halifax & DARS
Martin, M0GQB,
01422 341 317
18 Standards evening - check your measuring equipment

Sheffield ARC
Peter Day, G3PHO,
sarc@g3pho.org.uk
3 Quiz night (with prize) by Nevil, G3VDV
10 My visit to China by M5DWI
17 SARC Christmas dinner
24, 31 Closed

At the Great Northern Hamfest in Barnsley, Annie, M6PLJ wore a dress made from radio show entry tickets! It created lots of interest from dealers and the general public.

Almost 50 members and guests attended the recent annual Auction Sale at **Denby Dale Amateur Radio Society**. Over £100 was raised for club funds and raffle prizes were donated by members and LAM Communications. DDARS, which won Region 4 Club of the Year 2010, will be celebrating its 40th anniversary in 2013. The photo shows (from left to right) Brian, G0BFJ and Gerald, G3SDY checking out some of the surplus equipment.

Hull & District Amateur Radio Society meets twice a week at the Walton Street Leisure Centre on Tuesdays and Fridays. The club helps to promote their city by organising special event stations, such as the 700th anniversary of the city of Hull becoming a city. They also visit schools and other institutions giving lectures and instruction on the use of the radios.

Members of **Denby Dale Amateur Radio Society** took part in two major scouting events during October. Operating GB2WYS from Bradley Wood Scout camp near Huddersfield, the club participated in 'Grim up North', a meeting of Scout leaders organised by West Yorkshire Scouts. This was followed by the popular JOTA weekend.

Phil, G4FSQ, Brian, G0BFJ and Darran, G0BWB prepare to raise the tower

Many other Scout groups were contacted during very good band conditions; the most notable being in Japan when messages were exchanged by the many Scouts taking part in the event. Over 30 Scouts visited the three stations operated by club members, who also helped 11 Scouts to win their Communications badges during a most enjoyable and rewarding series of events.

GB50WVR was on the air to celebrate the 50th anniversary of the forming of the Keighley & Worth Valley Railway. Operating for the Winter Steam Gala in February, with snow on the ground, they were greeted by a huge pileup after the first call. Operators were Jack, G0FQN, Mark, G1PIE and logging was Pam, 2E1HQY.
Returning in September for the annual Railways on the Air weekend, they again faced pileups. A good time was had by all operators – Jack, G0FQN, Kevin, MOXLT and Mike, M3GNS logging and operating. They hope to air the callsign once more before the end of the year. With over 240 QSOs logged so far, the QSL manager Pam, 2E1HQY has been busy (the cards were designed and printed by Geoff at FDS Cards).

REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, MOVRR, RM5@RSGB.ORG.UK

Aldridge & Barr Beacon ARC
Albert, G0KFS,
01922 614 169
3 Christmas buffet
17 Closed

Bromsgrove & DARC
Chris, M0BQE,
01905 776 869,
g3vgg@hotmail.com
7 VHF night
14 Christmas dinner
21 Christmas quiz
28 Review of the year

Cheltenham ARA
Derek Thom, G3NKS,
01242 241 099,
13 AGM

Coventry ARS
John, G8SEQ,
07958 777 363
7 Journey to Svalbard part 2, G4GEE
14 Project 2013 introduction
23 Curry night

Gloucester AR&ES
Anne, 2E1GKY,
01452 548 478, daytime,
www.g4aym.org.uk
17 Leta's Christmas buffet

Midland ARS
Norman, G8BHE,
07808 078 003
5 Open meeting, shack on the air and training classes
12 Christmas Party, 7.30pm
19, 26 Closed

South Birmingham RS
Don, 01214 581 603,
www.radioclubs.net/southbirmingham
3 Open meeting and report on RSGB EGM
7 Work in the shack
10, 14 Christmas party arrangements
17 Review of contests for 2013
21 Work in the shack
24, 25, 31 Closed

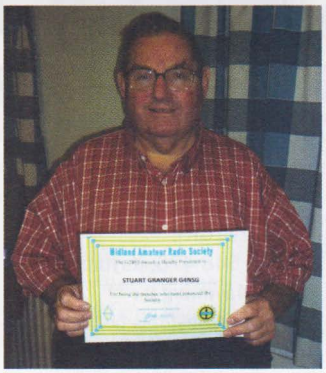
Stratford Upon Avon DRS
01608 664 488,
cousbey@theiet.org
10 Test equipment evening, John, G0JUQ

Tamworth ARS
Darren, secretary@tars.es
8 CEOP, - Steve Smith

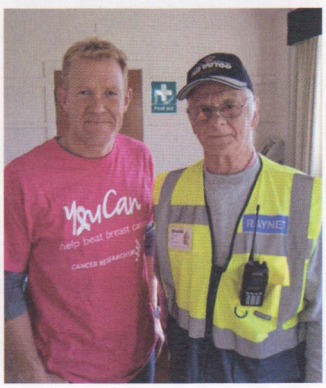
Telford & DARS
Mike, G3JKX,
01952 299 677,
mjstreetg3jkx@blueyonder.co.uk
5 Committee meeting, GX3ZME OTA HF/2m
12 Christmas dinner at Alscott
19 Mince pie/mulled wine social
26 Closed

Wythall Radio Club
Chris, G0EYO,
07710 412 819
1 Advanced course, 0900
2 144MHz AFS Contest + club net on 145.225MHz FM, 2000
3 Advanced course mock exam
4 Morse Class, 1945 & free 'n' easy evening, 2030
5 Advanced exam, 1830
7, 14, 21 Shack social, 1930
8 Christmas party, 1930
9, 16, 23 Club net on 145.225MHz FM, 2000
11 Morse Class and Committee meeting, 2030
18 Morse Class, 1945 & talk on Wythall Christmas contest by Lee, G0MTN
24 Wythall RC Christmas Contest begins 2000
25 Closed
28 Christmas fox hunt, 1000, shack social, 1930
31 Curry night at the Monsoon, 1830

At the **Midland Amateur Radio Society AGM** in October there were a series of presentations. Stuart, G4NSG was honoured for being the member who most enhanced the society – he's the editor of the quarterly magazine *PROBE*. Ron, M0NSW was recognised for his lecture and Jackie for her work in the society. Ron and Jackie both received their awards from Past President Jim, M1CPC.



Members of **Gloucestershire County RAYNET** recently supported the annual Cancer Research 'Walk in the Cotswolds' centred on the picturesque village of Guiting Power, near Stow on the Wold. The absence of mobile phone coverage meant the team kept the control station informed of progress, with a 'sweep walker' at the rear of the course. One of the participants this year was local farmer and BBC Countryfile presenter, Adam Henson, pictured with Group Controller, George, G0AZD. Adam took a keen interest in the RAYNET participation. The Group have also put on a JOTA station in the Forest of Dean and operated a demonstration station on behalf of the County Council Civil Protection Team at the open day of the new Gloucester North fire station. Summer months involved supporting backup communications for the CPT at the RAF Fairford Air Tattoo, an overnight Scout walk near Cheltenham and the Olympic Torch Relay in the north Cotswolds.



REGION 6: NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

Dragon ARC
Stewart Rolfe, GW0ETF, 07833 620 733
3 Open forum - member's ideas for 2013
17 Christmas social evening

Wrexham ARS
Frank Bailey, M1EYH, fcbailey20@btinternet.com
4 Christmas dinner
18 Natter night

REGION 7: SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, RM7@RSGB.ORG.UK

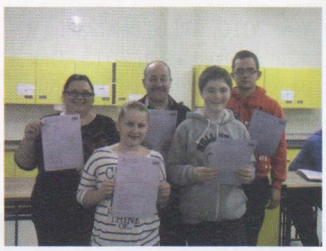
Carmarthen ARS
Lloyd, 2W0LLT, 01239 711 297, 2W0LLT@talktalk.net
4 Christmas party
18 GE4YCT/GC4YCT on the air and mince pies

REGION 8: NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, RM8@RSGB.ORG.UK

Bangor & DARC
Mike, GI4XSF, 02842 772 383
6 JT65 talk

Carrickfergus Amateur Radio Group has tasted success with their recent Foundation students. In the photo, from left to right, you can see the successful candidates Jordan Thompson, Kane Cochrane (back row) Sara McCartan, David Jennings and Daniel. Jordan is the youngest to do the exam in the club.



West Tyrone Amateur Radio Club presented a cheque for £1000 to Brian McCluskey from NI Chest Heart & Stroke. The money was raised through a club BBQ held in the Gortin Glens in September. The event was in memory of the late Charlie, GI6DCC, a founding member of the WTARC and a lifelong amateur radio enthusiast. Pictured left to right are Sean, GI0EJT, treasurer, Karl McCrystal (Charlie's son), Eddie, GI7FHZ, Chairman, Paul, MI6BII, event organiser and Brian McCluskey. Missing from the photo are event sponsors Rodger Latamer, Seskinore Meats, Ann Howe, Culmore Diner and Colleen Heaney, Asda Store, Omagh.

Bangor & District Amateur Radio Society made a visit to Drumawhey Miniature Railway to operate GB2DMR for Railways on the Air. They managed to contact around 25 other Railways on the Air stations and put a VHF station on the air to publicise the railway and amateur radio to local stations, clocking up around 30 contacts on 2m and also had a few members of the public call in to see what was happening.

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

Bromley & DARS
Andy, G4WGZ,
01689 878 089
1 Intermediate course
18 Mince pie night/quiz by Max & Hugh/Alan G0HIQ
Burnham Beeches RC
Dave, G4XDU,
01628 625 720
3 75th anniversary Christmas social
17 Video evening
Chesham & DARS
Terry, G0VFW,
01442 831 491,
cdars.club@ntlworld.com
5 General meeting
12 Christmas party
19 Pre Christmas drinks
26 Closed
Coulsdon ATS
Steve Beal G3WZK,
secretary@catsradio.org
10 AGM
Cray Valley RS
Malcolm Bryan, G8MCA,
07906 433 965
6 DXing from W5, Michael Streeter, WM5DX
20 Christmas social
Crystal Palace R&EC
Bob, G3OOU,
01737 552 170,
g3oou@aol.com
7 Christmas social
Edgware & DRS
Mike, G4RNW,
020 8950 0658,
michael.stewart5@ntlworld.com
13 Christmas social
Radio Society of Harrow
Linda, G7RJL,
020 8386 8586,
www.g3efx.org.uk
7 Construction contest
14 Christmas social
Reading & DARC
Pete, G8FRC,
01189 695 697
7 Christmas dinner
13 AGM followed by social
Shefford & DARS
John Burnett, M6JBU,
07860 804 793
6 Mince pie evening
Southgate ARC
Mr D F Berry, G4DFB, dfberry@eggconnect.net.
12 AGM
Surrey Radio Contact Club
John, G3MCX,
020 8688 3322,
secretary@g3src.org.uk
3 Club talk
12 Natter and fix it night
Sutton & Cheam RS
Darren, M0PRV,
07525 753 702,
info@scrs.org.uk
13 Christmas junk sale (note: 2nd Thursday of the month for this month only)
Wey Valley ARG
www.weyvalleyarg.org.uk
7 The Falkland Islands by Roger Eeles, G0SWC
21 Christmas Jolly
Wimbledon & DARS
Andrew Maish G4ADM,
02083 353 434
14 Christmas social
28 Closed

Verulam ARC secretary, Ralph, G1BSZ was made an honorary member of the club at its October meeting. This was in recognition of Ralph's long and distinguished service to the club. The fact that VARC has survived to celebrate 50 years existence is due in no small part to Ralph's contribution. May it long continue.

In October, **Burnham Beeches Radio Club** had yet another successful Foundation course and all 9 students passed. The previous course, held in March, had another 11 students pass.

Congratulations to new licensees, particularly from tutor Ian, M1FHU (far left) and lead instructor Dave, G4XDU (far right).

Reading and District Amateur Radio Club had two successful candidates who passed with high scores in the recent Foundation exam. In the picture from left to right are Graham, G3XZJ registered instructor, Mo Dhami Foundation Pass, Trish, G8DZC Invigilator, David James, Foundation Pass and Colin, M0XSM, invigilator.
The next Foundation course will be in April followed by the intermediate course in May and a one day intermediate practical course and exam in late summer or for those ready to sit the Advanced course or take the Advanced exam in December.

Six Candidates sat their Foundation licence exam at **Chesham & District Amateur Radio Club** and all six gained a pass. Congratulations to John, M6JHP, Dylan, M6DWZ, Katherine Clark, Emad Wali, Haotian, M6LHS and Ian, M6IJH.

REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

Brede Steam ARS
Steve, 01424 720 815,
M0NUC@aol.com
1, 4, 11, 18 At the shack
Harwell ARS
Malcolm, G8NRP,
01235 524 844
11 Amateur radio astronomy by Brian Coleman, G4NNS
Hastings E&RC
Gordon,
01424 431 909,
www.herc.uk.net
26 Closed
Horndean & DARC
Stuart, G0FYX,
02392 472 846,
www.hdarc.co.uk
6 Natter night/social evening
20 Closed
Horsham ARC
www.harc.org.uk
6 AGM
8 Christmas dinner
20 Social at The Royal Oak
Itchen Valley ARC
Liz, M0ACL,
02380 254 599,
m0acl@ivarc.org.uk
14 Christmas social
Mid-Sussex ARS
Rob, 2E0RJA,
01444 232 129,
2e0rja@msars.org.uk
7 Christmas meal
14 Radio night
21 Christmas quiz
28 Closed
Southdown ARS
John, G3DQY,
01424 424 319
2 Christmas social at Chaseley
5 Operating at Hailsham shack
Swindon & DARC
Den, M0ACM,
07810 317 750,
www.sdarc.net
6 Christmas dinner
13 Talk by Mike Parkin, G0JMI, of Alton Antenna Arrays
20 Activity night
27 Closed
Trowbridge & DARC
Ian, G0GRI,
01225 864 698, E/W
5 Christmas social and presentation night
19 Natter night and committee meeting
Worthing & DARC
John, G8FMJ,
01273 593 232
2 Monthly breakfast meeting at The Goring café, 9am
5 G8MSQ Christmas quiz
12 Christmas party
19 Closed
24 80m Santa Claus net
25 Christmas Day 2m net

Horndean & District ARC ran their 9th Foundation licence class and exam, and their 9th Intermediate exam in September. All 8 Foundation licence candidates passed, as did all 3 Intermediate licence candidates. The club then ran their 10th Intermediate exam in October. On the same day they also held an Advanced exam for three candidates. Training was supported with equipment bought

with the Awards for All Lottery grant. Both Intermediate level candidates passed, as did all three Advanced level candidates. The club congratulate all the successful candidates and thank the club's Foundation tutor John, M0HEX, Intermediate tutor, Ronald, G3UKU, Advanced tutor Rob, M0RZF and all the exam team. The first photo shows, left to right, Richard Cooke, now 2E0XAO, Intermediate tutor Ronald, G3UKU and Dennis Baker, now 2E0DNN.

The second photo shows Gordon Flinn, Grahame Webster, M6BYU, David Rudling, Michael Clarke, Kevin Sidaway, M6KAQ, Claire McLennan, M6NCE, Dawn Mills, M6WBX, Simon Bradley and tutor John Ash, M0HEX.

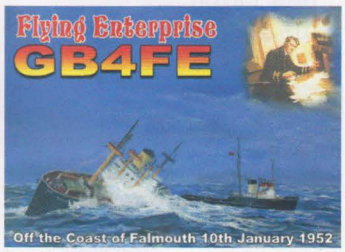
The 3rd photo shows Paul Evans, 2E0HPL, David Games, 2E0DCE, Chris, M0KTT (Intermediate level administrator), Michael Barker, 2E0REC and tutor Ronald, G3UKU.

REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

Appledore & DARC
Brian Jewell, M0BRB,
01237 473 251
10 Christmas party
Bristol RSGB Group
Robin, G3TKF,
01225 420 442
31 OTA
Cornish Radio Amateur Club
Steve, G7VOH, 01209 844 939, G7VOH@btinternet.com
6 Construction night (change of date due to local elections)
20 Main meting
Exeter ARS
Nick, 2E0NRJ,
01363 775 756,
info@exeterars.co.uk
3, 10, 17, 25 Monday HF net on 3,675kHz at 19:45
4, 11, 17 Tuesday 2m net on 145.575MHz at 19:45
6, 13, 20, 27 Thursday 4m net on 70.425MHz at 19:00
10 Bring in something interesting evening, Moose Centre, 7pm
19 Christmas skittles night, Moose Centre, 7pm
Plymouth RC
Rob James, 2E0ONO,
Robert-james@virginmedia.com
11 Christmas party
Saltash & DARC
Brian, M0BHG,
01752 844 321,
m0bhg@yahoo.co.uk
14 Mince pies & sherry evening
South Bristol ARC
Andrew Jenner, G7KNA,
07838 695 471
6 Table top sale with
13 Christmas social with
20 Christmas greetings from the club station
27 New Year greetings from the club station
Thornbury & South Gloucestershire ARC
Tony, G0WMB,
01454 417 048, tonytsgarc@btinternet.com
5 2.4GHz by Arnie Mansell
12 OTA
19 Chairman's quiz and social
26 Closed
Torbay ARS
Dave, G6FSP, g6fsp@tars.org.uk
7, 21, 28 Natter night and net
14 Christmas party and quiz with invited local clubs

GB4FE will operate from 27 December until 31 January to commemorate the loss of the Flying Enterprise off Falmouth. Operations are planned on 20, 30, 40 and 80m with Chris, M0DOL and Gary, M0NNH on SSB and Geoff, M1EDF on CW.



REGION 12: EAST & EAST ANGLIA

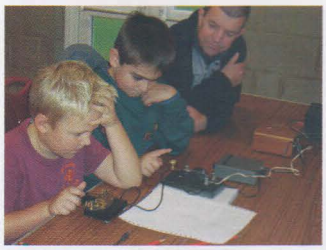
REGIONAL REP: MARK SANDERSON, M0IEO, RM12@RSGB.ORG.UK

Braintree & DARS
John, M5AJB,
01787 460 947
3, 10 Social evening
17 Natter night
24 70cm club net
Cambridge & DARC
Ron, G3KBR,
01223 501 712
14 Colossus and code breaking at Bletchley by Martin, G3ZAY
Chelmsford ARS
Martyn, G1EFL,
01245 469 008,
www.g0mwt.org.uk
Note new date and venue – Great Baddow Parish Hall
7 How to sell radio equipment on eBay by Belinda Sanderson; re-license your licence, 7.30pm
8 Christmas lunch, noon
11 2m net on GB3DA, 8.30pm
12 Committee meeting
18 70cm net on GB3ER, 8.30pm
25 Net on 1.975MHz, 8.30pm
Colchester Radio Amateurs
Kevan, 2E0WMG,
07766 543 784,
kevan2e0wmg@live.co.uk
20 Christmas social
Darenth Valley Radio Society
Bob, M0RAW,
01322 663 804,
to m0raw-bob@talktalk.net
12 Quiz evening and fish and chip supper
East Kent RS
Karl Davies, M1DFM,
01227 710 120,
karl.davies@talk21.com
12 Christmas dinner
Harwich ARIG
Kevan, 2E0WMG,
07766 543 784
kevan2e0wmg@live.co.uk
12 AGM & Christmas party
Huntingdonshire ARS
David Leech, G7DIU,
01480 431 333,
david.leech1@ntlworld.com
6 Christmas dinner
13 Mince pie evening
Lowestoft District & Pye ARC
Tim Ward, 2E0TJW,
07810 481182,
tim@2E0TJW.co.uk
6 Club Night at the Shack
13 Cheese and wine evening
20 Club Night at the Shack
Norfolk ARC
Chris Danby, G0DWV,
01603 898 678,
cmdanby@btinternet.com
12 Christmas party
South Essex ARS
Dave, G4UVJ,
01268 697 978,
g4uvj@btinternet.com
11 Christmas social evening
Thames ARG
Pete Sipple, M0PSX,
07940 579 116
7 Digital modes and mince pies

Vange ARS
Steve, G0KVZ, 01268 552 606, vars@live.co.uk
6 Junk sale
13 DVD
20 VARS Christmas buffet

West Kent ARS
Keith, G4JED, westkentars@googlemail.com
10 Christmas social

South Essex Amateur Radio Society had a very hectic JOTA weekend this year. On 20 October they operated GB2CIS for the 1st Canvey Sea Scouts at Canvey Heights and on the 21st it was GB1RS for the 1st Rayleigh Scouts at their Scout Hut in Rayleigh. Contacts on both days came thick and fast. They used a full size G5RV on both sites and a 5/8 over 5/8 collinear at 30ft for 2m on both days. Fortunately, they were never short of willing Scouts, queuing to get on the radios. A very tiring weekend, but worth it when you get excellent feedback from the Scout leaders that they appreciate the work put in.



Braintree and District Amateur Radio Society took part in JOTA at the HQ of the Earls Colne Scouts with 2nd Braintree Air Scouts taking part too. Using mainly HF because the location did not favour VHF, the Scouts from both troops were soon hard at it. In groups of 3 or 4 they were passing their greetings messages to other stations and filling in their log sheets. They all gave their names in phonetics and many were complimented on their radio technique. Over the weekend the 37 Scouts from both troops sent and received nearly 500 messages to 7 countries.

Dover Amateur Radio Club has reached its 55th year. The photo shows a collection of some of the current members, with Ian Keyser, G3ROO sat in the front row. Ian is the only remaining founder member. The club meets every Wednesday between 7 and 10pm at the Old Park Community Centre, Whitfield. Members old and new and any amateur passing by will always be given a warm welcome.

Recently formed, the **Thames Amateur Radio Group** is encouraging all aspects of amateur radio by providing support, information and education. This includes Foundation courses as the nearest other training provider is 20 miles distant and not easily accessible by public transport. For this reason a local meeting hall with an upstairs room has been hired. This has been refurbished, fitted with desks, chairs and new carpet. There are two operating positions fitted with HF and VHF/UHF transceivers and computers. A workbench includes a signal generator, frequency counter and dual beam oscilloscope. The modest antenna system will be updated shortly. Members can use the shack, by prior arrangement, for a modest fee. www.thamesarg.org.uk.

Dover Radio Club were visited by Region 12 DRM, Keith Bird. Among other things he helped judge the construction contest. The photos show Keith presenting Peter, G0KOK with the winning shield and his winning valve CW transmitter. There were around thirty entries ranging from simple Maplin kits to remote controlled linear amplifiers.

REGION 13: EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

Derby & DARS
Richard Buckby, radio@dadars.org.uk
4 Junk sale
11 Committee meeting
18 Christmas social evening
25 Closed

Eagle RG
John, M6JMS, 01754 873 926, simfree@btinternet.com
11 Review of the year by Gordon, G4WEC

Lincoln Short-Wave Club
Pam Rose, G4STO, 01427 788 356, pamelagrose@tiscali.co.uk
1, 8, 15, 22, 29 Saturday surgery in the shack, 09.00
4 144MHz UK AC, the shack, 20.00
5 G5FZ OTA in the shack + natter night at BSA club
6 Repeater net, 145.725MHz, 20.00
7 Christmas party
11 432MHz UK AC, the shack, 20.00
12 G6COL OTA in the shack + brainstorm on digimodes at BSA club
13, 20, 27 Club net, 145.375MHz simplex, 20.00
17 Committee meeting in the shack, 19.30
18 1.3GHz UK AC, the shack, 20.00
19 Formal meeting followed by Christmas quiz, BSA club, 20.15
26 Closed

Loughborough & DARC
Chris, G1ETZ, 01509 504 319
4 Talk on antenna filters, Andrew, G7SEG
11 Talk on computer disasters, Andrew, G7SEG
18 Christmas drink at Pied Bull
25 Closed

South Kesteven Amateur Radio Society
Nigel, M0CVO, 01476 402 550
5, 19 Club net, 145.525MHz, 20.00
12 Club meeting
15 Christmas buffet and raffle

South Notts ARC
Robin G4NDM, 01159 372 942, g8ddsnarc@ntlworld.com
4 2m contest
5 Advanced exam & Decatron/Digitron by G8LNG
12 Christmas dinner
19 Coffee and mince pies

Welland Valley ARS
Peter D Rivers, G4XEX, 01858 432 105, g4xex@fsmail.net
3 Club net on 145.275MHz
10 Christmas dinner

Lincoln Short Wave Club joined 7th Lincoln Scouts for JOTA. They made a number of contacts over the weekend and the Scouts we able to pass greetings on to other Scouts. 12 Scouts were assisted in achieving their Radio Communicators badge. A great weekend was had by all. The photo shows Steve, M5ZZZ, Dave, M0KWM and Stan, M6MJP, all members of the Lincoln Short Wave Club, with members of 7th Lincoln Scouts.

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TH-D72E

TS-590S

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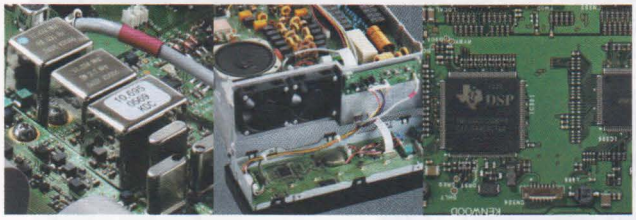

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www.kenwood-electronics.co.uk e-mail comms@kenwood-electronics.co.uk

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1970s TRIO HF SEPARATES: JR599 + TX599 Custom Specials, including multifunction VRO control cable, original user manuals with circuits and spare TX599 transmitter valves. Good working condition, will not split. Offers £90+. Martyn, GW4CQZ, 07803 078 456 daytime, martyn@doigm.freeserve.co.uk (Denbigh).

60FT HEAVY DUTY MOBILE VERSATOWER. VGC, rewired and cage, £3,000. No offers or time wasters this time please. Trev, G2KF, 07974 892 179, g2kf@btinternet.com (nr Tintagel).

ALINCO DR-130E 2m mobile FM transceiver. 50/5W with CTCSS etc. In 'as new' condition (remarkably good) and perfect working order. Original box/manual/mic/power lead etc. Call for full details and pics. £70 ONO. Lyndon Leach, GW8JLY, 02920 576 225 (Cardiff).

ALTRON S342 3-section tower complete with Emomator 747-SRX rotator and controller. Height retracted 20ft/6m. Height extended 42ft/12.8m. Post mounted. £125 ONO. Buyer collects. Moved house, not required at new QTH. Ray Taylor, G6TNZ, 07772 049 908 (East Yorks).

AMERITRON AL811 HF linear amplifier, good condition, with manual and original packing, £450. David, G4ERW, 01233 860 266, david.lurcook@btinternet.com (Ashford, Kent).

BRAUN T 1000 CD RECEIVER. 12 bands 130kHz-30MHz plus 88-108MHz. Fair. Tone control intermittent. Offers to Mr Browne, G0VCD, 01242 220 891 (Cheltenham).

DRAKE 2B RECEIVER, GWO & condition, c/w speaker, manual & spare valves, £90. Eddystone EC 10 MK II receiver, nice condition c/w manual, £30. KW (E-ZEE) Match antenna tuner, as new condition, c/w instructions, £50. Buyer views/collects. Dave, G3LUL, 01622 681 294, g3lul@btinternet.com (Maidstone).

FLEXRADIO 1500 SDR transceiver, QRP 160 – 6m, mint condition, supplied by W&S 31/07/12, little used. See *RadCom* review April 2011. Ill health forces sale. With leads, *Power SDR* software, full owner's manual, in original packaging. £460, recorded postage included. Robin MacRory, GI4JTS, 028 9181 9812, robin.macrory@hotmail.com (Newtownards, Co. Down).

FREE TO GOOD HOME. RSGB *Bulletin* and *RadCom* collection from 1947 to the present. New owner collects, or pays carriage at cost. John Ewen, G3HGM, 01582 733 436, john.ewen@mypostoffice.co.uk (Luton).

FT-767GX + SP-767, YH-55, MH-1, £350. MM3 triband + Kenpro rotator + 60ft 7 core, £250. FT-727 h/h + spk mic / headset etc, £30. All with manuals. Palstar amp PS-15, £35. EAGLE m/meter £150. All ONO. G0BVC, 01404 861 537 (nr Honiton).

ICOM IC-7800 XCVR, mint condition, little used due to ill health. In original box, together with Heil 780 mic, Icom SP-20 speaker, £5800 ONO. Buyer to collect if poss. Paypal or cash. Clive, 2E0FZM, 07849 492 975, clvrams@clvrams.karoo.co.uk (East Yorkshire).

ICOM IC-R72 short wave receiver, £250. Icom IC-R71E short wave receiver, £175. Global coupler AT-1000 ATU, £40. All items in good condition and good working order. Plus postage or collect. Mike Devon, SWL, 07557 977 500 (Newcastle under Lyme).

PRE-CIRCULATED INTERNATIONAL REPLY COUPONS (IRCs). Slash your QSL return postal costs vs 'green stamps'! Available in any quantity at £1 each plus £1 postage per order. 25 or more post free. Expiry 31/12/2013. Email for further details. Gordon, G3USR, 01572 737 774, g3usr@btinternet.com (Oakham).

JCC DESK TOP MIC TYPE JCD201M (wired for Icom), as new, £45. Rob Stratford, G6BDV, 01582 458 964 (nr Harpenden).

KENWOOD TS-2000X HF to 23cm transceiver. Owned from new, just 18 months and barely used. Condition as new, perfect working order, boxed. Prefer collect/deliver. Offers. Alex Wickham, G3IAZ, 01323 472 408 (Eastbourne).

KENWOOD TS-440S HF transceiver with matching power supply PS-50 and MC-60 mic, boxes and manual. Good condition and in perfect working order. Buyer to inspect and collect, £410. Richard Davies, G0MJP, 07918 600 313, dickydavies@sky.com (Letchworth, Herts).

KENWOOD TS-850SAT transceiver covering 160 through 10m incl WARC bands. In excellent condition electronically and cosmetically. Original box & manuals. 100W out. Comes complete with 500Hz filter and auto ATU. £450 plus carriage or meet half way to demonstrate. Alan, G4BLI, 07759 821 742, rigforsale@btinternet.com (Plymouth).

LDG-Z817 AUTO ATU, as new, hardly used, purchased July this year, complete with connecting lead, batteries and boxed. Absolute bargain £75 plus p&p. John, M6JMS, 01754 873 926, simfree@btinternet.com (Chapel St Leonards, Lincs).

MUTEK VHF GEAR. 6m transverter TVVF-50C, 2m in, 10W 6m out. 12V operation, excellent condition, £150. 150W 2m linear LAVF-144/150 plus mains PSU 50/6, both in excellent condition, £250. Adrian, G4UVZ, 01823 421 751, adrianwhatmore248@btinternet.com (Taunton).

OPTIBEAM OB10-3W 10-ele beam for 20/17/15m. New, unopened, sealed in the manufacturer's packaging. Huge saving on new at £850. Yaesu FT-736R 6/2/70/23, muTek front end, Includes CTCSS, matching desk mic, speaker and boxes, VGC, £600 ONO. Will, G7MND, 07966 161 692, wsouth@ensign-net.co.uk (Wareham).

PHILIPS (PYE) PF85 three channel UHF FM hand-held Pocketfone. Tx/Rx: 433.500MHz (SU20). UHF aerial & Ni-Cad battery pack included. Philips BC34 desk battery charger. Philips Bodyworn Adapter. Philips Service Manual TP311. All in good condition, £10 each item, plus P&P. Peter, GW4GCB, 01745 720 756, peter.kay1@virgin.net (north Wales).

SK SALE from the estate of G3JBU. Offers invited for: *Admiralty Handbook of Wireless Telegraphy 1938*, vol 1 & 2. Kenwood HC-10 world clock. Kenwood ST-2 base stand charger. Bush YX9002 headphones. ACOS MIC36 crystal mic in original container. ETM-3 iambic keyer/paddle. *RSGB Radio Communication Handbook 4th edition. Radio Amateur Callbook 1990* international listings. Information leaflets – AOR AR-2002, Kenwood TS-140S/680S, Trio TS-440S, Swan Model 350, Marconiphone 4153, Avometer Model 8 Mk 5, Eddystone 888A general servicing. Also valves, some boxed (phone for list). Pam Hayes, 01604 401 800 (Northampton).

TEN TEC ARGOSY II 5/50W transceiver, Ten Tec model 225 PSU, Ten Tec model 227 ATU, Ten Tec KR50 keyer. All instruction manuals included. Good condition despite age. Complete set £200. Piet, M0PHV, 01386 840 146 (nr Stratford Upon Avon).

TIGERTRONICS SIGNALLINK SL-1, for interfacing transceiver to PC sound card. Complete with CD and manual, £25 plus p&p. Chris, M0PSK, chrism0psk@gmail.com (Liverpool).

TWO OFF 7-ELE 70MHz aerials and power splitter. Made from high quality materials as G4ASR's design, but allowing easy assembly in the field for portable operation. These are very long at 6.5m and approx 14dBd. £250. Nick, G0HIK, text 07955 635 646, nickg0hik@googlemail.com (South Cumbria).

TWO YAESU FR-50B Rx, £100 each. Two Datong FL-1 Agile Filters, £50 each. SEM Z Match, £75. All in good condx. Collection preferred. Nigel, G4KZZ, 01723 890 786, nipro@btinternet.com (Scarborough).

UK LINEAR 1.5kW Mk 4 HF amplifier in VGC, original manual, unmarked, non smoker. Reason for sale: upgraded. Will deliver up to 50 miles, or buyer arranges collection. £990. Ivor Toon, G4YIT, 01733 840 268, g4yit@yahoo.co.uk (March, Cambs).

UNIDEN SC230 close call intelligent scanner, 25MHz to 1300MHz with breaks, AM, NFM. Good condition with manual, BNC antenna and charger, £80 plus UK postage. Peter, GW0ETN, 07514 671 202, gw0etn@yahoo.co.uk (county of Conwy).

W2AU QUAD SPIDERS. Made of cast aluminium and designed to fit a 2" boom. In good condition, £30 for the pair. Postage at cost if not collected. J H Jones, GW3TMP, 01352 771 520, jhj43@btinternet.com (Mold, Flintshire).

WOUXUN KG-UV6D 2m/70cm handy + accessories, perfect condition, £65. 80m homebrew SSB QRP Tx/Rx, £15. MFJ Deluxe HF ATU, £25. Ex-military long wire, £3. Large magmount, £5. Beginner Morse key, £3. Ex-military Morse key, £5. All exclude postage. Offers considered. Ben, M0BZE, 01908 375 310, Ben.Allen@beds.ac.uk (Milton Keynes).

YAESU FT-847 Bought from LAM. 5 months warranty remaining. Works perfectly on 4m. With matching ATU, £900. Mick, G1XGM, 07757 607 409, mde-wynter@live.com (Bradford).

WANTED

7651 RF POWER TETRODE. Preferably unused in as new condition. Also known as YL1110 or RS1064C. These are ceramic coaxial power tetrodes. Ideally two or three needed depending on price. Keith, G0JLO, 01666 825 616, keith@analog.co.uk (Malmesbury).

ICOM IC-575H must be in good condition, no mods. Poul, G7BTP, 07912 946 370, g7btpuk@ntlworld.com (Immingham).

ICOM IT-500 AUTO ATU in clean good working order with leads, box + manuals if possible. T Buckle, G0EWV, 01204 524 819 (Bolton).

LOWE PR150 & SP150, complete and in good condition, preferably working. Will consider complete HF150 trio with stand. Derek, RS172507, 01582 832 930 (St Albans, Herts).

PYE CAMBRIDGE FM10D, (B band), also Garex VFO for project. Ted, G8HLJ, 01513 421 222, ejedwards9@gmail.com (Wirral).

HELPLINE

Roberto Craighero, I1ARZ is doing some historical research on Gerald Isted, who was a technical assistant to Marconi in the early 1930s. He was very active with Marconi on experiments in UHF propagation and naval radio systems. Isted returned to the UK in 1936 and Roberto is keen to find out any information on what he did next. He presumes that it may have been in the UHF and/or radar field. If you have any information, or know where it may be found, please contact Roberto by e-mail to rcraighero@alice.it.

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

2 DECEMBER - **BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY** – Spennymoor Leisure Centre, Co Durham DL16 6DB. CP, TI S22 (V44), OT 10.15/10.30, £2 (U14 free). TS, B&B, C, LB, DF, FAM. Details Mark, G0GFG, 01388 747 497.

8 DECEMBER - **SOUTH LANCS WINTER RALLY** – Bickershaw Labour Club, Bickershaw Lane, Bickershaw, Wigan. OT 10am, traders 8am. Tables £8 pre-booked, entry £1.50, TI, B&B, C, DIS, CP, SIG, DF, TS, LB. Allan, 2E0RAG, 07533 970 841, rally@slarc.co.uk.

13 JANUARY - **RED ROSE WINTER RALLY** – George H Carnall Leisure Centre, Kingsway Park, M41 7FJ (easily accessible from M60 J9, opposite the Trafford Centre). Free CP, B&B, C, OT 11am, TS, SIG, DF, RSGB book stall. Steve, 07502 295 141. [www.wmrc.org.uk].

20 JANUARY - **DOVER AMATEUR RADIO CLUB RALLY** – Whitfield Village Hall, Dover CT16 3LY. 10am – 1pm, £2, auction 12.30pm. Peter Halloway, M0PKH, 07775 515 890, peter.halloway@sky.com. [www.doverradiorally.com].

20 JANUARY - **PENCOED AMATEUR RADIO CLUB BRING & BUY SALE** – Pencoed Rugby Football Club, The Verlands, Felindre Road. Pencoed CF35 5PB. Tables £5 each, bookings to Gerry Day 01656 860 761. Doors open at 08:30 for sellers. OT 9.30, £2, C. [www.mw0prg.co.uk/events.uk].

3 FEBRUARY - **28th CANVEY RADIO & ELECTRONICS RALLY** – 'The Paddocks', Long Road, Canvey Island, Essex SS8 0JA (southern end of A130). Free CP, OT 10.30, C, DF, TS. Vic Rogers, G6BHE, 01702 308 562, nvr@blueyonder.co.uk. [www.southessex-ars.co.uk].

3 FEBRUARY - **RADIO-ACTIVE RALLY** – Civic Hall, Nantwich, Cheshire CW5 5DG. Organised by the MidCheshire Amateur Radio Society. CP, OT 10.30, TS, B&B, C, DF. Simon, G8ATB, 01270 841 506, Simon@G8ATB.co.uk. [www.midcars.org].

This list shows all rallies and events we are aware of as of press deadline. 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. We also recommend you check the details are correct in *RadCom*.

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.

SILENT KEYS

We regret to record the passing of the following Members:

Mr K B Salt, 2E0KAE	4/2012
Mr R P Schorn, DC5JQ	25/5/2012
Mr D H Barkley, G0DPI	
Mr J C Bales, G0HAT	9/9/2012
Mr R Beck, G0KQM	
Mr D L Hughes, G0RVW	28/9/2012
Mr S A Bell, G0SBI	
Mrs M Atkinson, G0WQM	28/8/2012
Mr E J Holmes, G3ALK	
Mr A R Edwards, G3DAC	12/10/2012
Mr K Rosier, G3DJK	27/9/2012
Mr A Davies, G3IIV	16/8/2012
Mr D S Roden, G3KXF	20/5/2012
Mr W G H Blanchard, G3LHB	3/8/2012
Mr M Firth, G3MMK	6/2012
Mr I M Cobbe, G3ZRZ	12/10/2012
Mr H W D Maude, G4YDG	2012
Mr S Walker, G6OGY	2/10/2012
Mr D C Derry, G8PQ	
Mr J T Barclay, GM4SDQ	23/10/2012
Mr G C Ingram, M0AGI	11/9/2012
Mrs C Parker, M3TBP	
Mr D Crossland, RS96263	

OBITUARIES

As part of the improvements to the RSGB website, an obituaries section is being opened at www.rsgb.org/sk and we welcome obituaries from clubs or individuals when someone sadly passes away. Please send submissions by e-mail(only) to sk@rsgb.org.uk. All submissions will be moderated.

SILENT KEY ENTRIES

The Silent Keys column is separate from the obituaries section. To notify the RSGB that a Member has passed away (and their subscription should end and they should be listed in Silent Keys), please e-mail sales@rsgb.org.uk or telephone 01234 832 700 and then select option 1. We will need to know the deceased's name, callsign or RS number and, if possible, date of death.

10 FEBRUARY - **HARWELL RADIO AND ELECTRONICS RALLY** – Didcot Leisure Centre, Mereland Road, Didcot. TI S22, free CP. OT 10.15/10.30, £2.50 (under 12's free).TS, FM, SIG, LB, C, DF. Ann, G8NVI, 01235 816 379, ann.stevens@btinternet.com. [www.g3pia.org.uk].

3 MARCH - **BRATS RAINHAM RADIO RALLY** – Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. TI, OT 10.00, DIS 9.30am, C. Trevor, G6YLW, 07717 678 795, trev@wig1.co.uk.

3 MARCH - **CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB RALLY** – Wood Green Animal Shelter, King's Bush Farm, A1198 London Road, Godmanchester, Cambs PE29 2NH. OT 10.00, CP, £3, TI S22, TS, B&B, LB, C, DF, SIG, FAM, David, M0ZEB, 01353 778 093, rally2013@cdarc.co.uk.

3 MARCH - **EXETER RADIO & ELECTRONICS RALLY** – America Hall, De La Rue Way, Pinhoe Exeter EX4 8PW. TS, B&B, C. OT 10.15/10.30, £2. Pete, G3ZVI, 07714 198 374, g3zvi@yahoo.co.uk.

3 MARCH - **SPRING MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE** – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, civil, military & vintage radio equipment, vehicle spares & more. Rod Siebert, 01270 623 353, coldwatr@hackgreen.co.uk. [www.hackgreen.co.uk].

SPECIAL EVENTS STATIONS

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.

Date	Callsign	Phonetics	Location	Bands	Keeper
08/12/2012	GB4RN	Royal Navy	Waterlooville	TLH2	G3LIK
11/12/2012	GB1WH	Wakefield House	Wakefield	TLHV27	M0IAA

10 MARCH - WYTHALL RC RADIO AND COMPUTER RALLY – Woodrush Sports Centre, Shawhurst Lane, Hollywood, nr Birmingham B47 5JW on the A435, 2mi from J3 M42. OT 10am-3pm, TS, C, £2.50, B&B, CP, TI S22 (V44). Chris, G0EYO, 07710 412 819, g0eyo@blueyonder.co.uk. [www.wrcrally.co.uk].

23 MARCH - DUTCH NATIONAL RADIO FLEA MARKET – "Autotron", Rosmalen, just off A59 motorway. TI PI4SHB, 145.500MHz, CP, OT 0900, €7. TS, FM, C. Details: info@radiovlooienmarkt.nl. [www.radiovlooienmarkt.nl].

24 MARCH - LOUGH ERNE AMATEUR RADIO CLUB ANNUAL RALLY- Share Discovery Village, Lisnaskea, Co Fermanagh BT92 0EQ, N Ireland. Access from Erne/Shannon Waterway. OT 11.30, CP. B&B. TS, LB, C, DF. Contact Iain, 028 6632 6693, iain@learc.eu.

7 APRIL - CAMBRIDGE REPEATER GROUP RALLY - Foxton Village Hall, Hardman Road, Foxton, Cambridge, Cambs, CB22 6RN. OT 10:00 (07:00), £2, TI, TS, B&B, C, DF. Lawrence, M0LCM, 01223 711 840, rally2013@cambridgerepeaters.net. [www.cambridgerepeaters.net].

7 APRIL - NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION (Blackpool rally) – Norbreck Castle Exhibition Centre, Blackpool FY2 9AA. TI, CP, TS, B&B, SIG, MT, LB, C, DF, RSGB book stand. OT 10.15 /10.30. Dave, M0OBW, 01270 761 608, dwilson@btinternet.com. [www.narsa.org.uk].

7 APRIL - SOUTH GLOUCESTERSHIRE AMATEUR RADIO RALLY – Scout Activity Centre, Woodhouse Park, Almondsbury, Bristol BS32 4LX. OT 10.00, B&B, CP, C, CBS, TI S22 (V44). Mike, M1DPB, 07806 310 095, southglosradiorallycoordinator@gmail.com. [southglosradiorally.org.uk].

28 APRIL - 29th YEOVIL QRP CONVENTION – Digby Hall, Hound Street, Sherborne, Dorset DT9 3AA (adjoining the central shopping car park). OT 9.30am, TI S22, CP, TS, LEC, B&B, C, DF. Steve, G7AHP, 01803 666 407, steve@g7ahp.co.uk.

2 JUNE - SPALDING & DARS ANNUAL RALLY – The Sir John Gleed Technology School, Halmer Gardens, Spalding, Lincs, PE11 2EF. TI S22, free CP, OT 10am, TS, C, CBS. John, G4NBR, 07946 302 815, rally-secretary@sdars.org.uk. [www.sdars.org.uk].

9 JUNE - 12th JUNCTION 28 QRP RALLY – South Normanton Alfreton and District Amateur Radio Club in association with the G-QRP Club. Alfreton Leisure Centre, Church Street, Alfreton, Derbyshire DE55 7BD. 10 minutes from M1 J28 and the A38. TI S21, OT 10am, TS, SIG, C, LB. Anya Lawrence, 2E0BQS, 0115 930 7322. [www.snadarc.com].

16 JUNE - 26th NEWBURY RADIO RALLY - Newbury Showground, next to M4 J13 in Berkshire. TI S22 (V44), free CP, OT 0900 (visitors) (0800 (sellers). £2 visitor, £10 CBS sellers pitch, WIN, C, DF, TS, FM, CBS, SIG. See G7N taking part in the 6m contest. Contact rally@nadars.org.uk. [www.nadars.org.uk].

30 JUNE - WEST OF ENGLAND RADIO RALLY – Cheese & Grain, Bridge Street, Frome, Somerset BA11 1BE. OT 10am-2pm, £2.50, TS, RSGB book stall, C, CP, DIS. Shaun, G8VPG, 01225 873 098, rallymanager@westrally.org.uk. [www.westrally.org.uk].

6 JULY - BANGOR AND DISTRICT ARS RALLY – Donaghadee Community Centre, County Down BT21 0HB. OT 11.30am, £3, TS, B&B, SIG. Bill, GI4AAM 02891 816 707, bill.langtry@btinternet.com. [www.bdars.com].

7 JULY - BARFORD NORFOLK RADIO RALLY – Barford Village Hall & Green, Barford, Norwich NR9 4AB, TI S22, CP, OT 9am, £1.50, U16s free, C, DF, WIN, TS, B&B. Contact radio@dcpmicro.com. [www.norfolkamateurradio.org].

21 JULY - AMATEUR RADIO IN THE COUNTRY – Upton Bridge Farm, Long Sutton TA10 9NJ. Amateur radio, QRP & homebrew in a country setting. TS, FAM, SIG. Tim Walford, G3PCJ, walfor@globalnet.co.uk.

22 SEPTEMBER - 24th GREAT NORTHERN HAMFEST – Barnsley Premier Leisure Complex, Queens Road, Barnsley S71 1AN or follow the brown Metrodome signs. GNHF in association with SYRG. OT 10.30am, £3.50. DF, TS, SIG, RSGB book stall, LB, C, FAM. Ernie, G4LUE, 07984 191 873. [www.greatnorthernhamfest.co.uk].

27 & 28 SEPTEMBER - 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). TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB book stall, RSGB Services & Committees, DF, FM. [www.nationalhamfest.org.uk].

11-13 OCTOBER - RSGB CONVENTION – The full convention programme of lectures for all interests will be available on the website later in the year. Principal sponsor Martin Lynch & Sons. [www.rsgb.org/rsgbconvention].

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 e-mail 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 maybe 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 anyway. 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.

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: 01603 898678 Fax: 01603 898678 E-mail: adsales@rsgb.org.uk
Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

FOR SALE

WANA DATA INTERFACE ? You need an Isoterm! Job Done.... Our Product help is always available. See www.g3liv.co.uk johnny@melvin.com 0191-2843028

GOTA VIBROPLEX BUG KEY, GHD (50mm available, 60mm soon) You need a CableTidy! Job Done.... See advert above

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 WW.RADIOARENA.CO.UK

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

CTCSS ENCODER AND DECODER KITS, DTMF kits, low cost LCD displays, Chris G6WHI www.cstech.co.uk

PERSONALISED EMBROIDERED BASE BALL CAPS, Polo shirts and Sweat shirts. With your name and call sign, club logo contact Bill M0WBH at email: billm3wbh@btinternet.com or www.tintagel-crafts.com

MODERN MILITARY SURPLUS. Unused antenna kit designed to survive the North Atlantic. Fernpatch Engineering Ltd. www.yachtradio.co.uk

BAOFENG, TYT & VERO HANDHELDS at best prices from authorised UK importer. Full range of accessories available. www.sinotel.co.uk, 01926-460203, sales@sinotel.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

AERIALS

WWW.PROANTENNAS.CO.UK Winter discounts for RSGB members on the DUAL BEAM PRO, I-PRO HOME and I-PRO TRAVELLER, provide discount code 0613 to Carl: 01489 789960

MOCVO ANTENNAS for all your amateur radio antenna needs. Full details at: http://www.m0cvoantennas.eu

NEW: PORTABLE RADIO SPECIALISTS SOTAbeams have opened a new webstore at www.sotabeams.co.uk Radcom readers will get a 10% discount using this voucher code FKVJBXTOAN9T. Code valid until the end of the month. 73 Richard G3CWI.

"WESTERN HF 10" 67ft wire dipole 160-6m, full details lookup m0bzi at: www.qrz.com buy direct: m0bzi@hotmail.co.uk or 07748331458 reviews at: http://g0kya.blogspot.com/2010_08_01_archive.html or http://www.eham.net/reviews/detail/9424

VORTEX ANTENNA SYSTEMS UK Manufacturer and hardware supplier. Delta Loops, Yagis, Monoband and Multiband, OWA Arrays, Bespoke Designs. Antenna parts and mounting solutions. 6082-T6 Metric Tubing, Stainless U-Bolts and much more. www.vortexantennas.co.uk or 07943 871893

COMPACT VERTICAL HF ANTENNAS, low visability. Details from www.aerial-worx.com

ALTON ANTENNA ARRAYS We supply 6m-2m compact Amateur Radio mini-beams. Visit:http://aaa001.webeden.co.uk/ Contact: email2aaa@btinternet.com

G4TPH PORTABLE MAGLOOPS back in production. Full details of the new ML40 model at: www.g4tph.com

COMPUTER SOFTWARE

PROGRAMMING CABLES & SOFTWARE FOR YAESU RADIOS Http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

CONTEST LOGGERS - SD by EI5DI. Free and Unrestricted in all RSGB HF Contests. www.ei5di.com

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

GITE, LOIRE ATLANTIQUE, sleeps 4/5, UKTV, from £100 per week. 01223911263, G6HKF

HOLIDAY COTTAGE AT JO28RJ (Eastern France) can cater for up to 13 persons, registered for the handicapped. Roman ampitheatre and Mosaic museum, both within ½ km. Elevation 375m (max. locally 440m to NE). Has 2m/70cm collinear and over 40m space. Visit http://apollon.gite.grand.perso.sfr.fr/ or Tel: 00 33 (0)670 968 765

PAFOS, CYPRUS. 2 bed villa. Simple HF station 300m ASL. www.domsvilla.co.uk/radcom

EQUIPMENT

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

CARDS & DESIGN

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BUSINESS CARDS

CLASSIFIED ADS

HARRY WHALLEY, G2HW AND 2012L

Graham Dobson, M0PTD

I was flattered to find that I shared a page in RadCom with the late Harry Whalley G2HW (p12 *RadCom* October 2012). I guess the photo of me operating at 2012L that appeared above that of Harry was to illustrate the Special Event achievement of our record number of QSOs – a humble achievement by comparison with Harry, G2HWs age, period of membership of RSGB and his important work for our great nation.

But my pride evaporated when I read the comment by Chris, M5LRO on p92, suggesting that most QSOs at 2012L were "59/73".

Operators at 2012L took their lead from amateurs who responded to the station call; those who wanted to chat were encouraged to do so and those who simply wanted 2012L in their log were respected. As an operator at 2012L, I had many long and enjoyable conversations with amateurs from all over the world, many of whom wanted to chat – not least to let us know how impressed they were with Great Britain's presentation of both Olympics and Paralympics – but also to make the usual friendly international overtures we enjoy as amateurs.

I am sure Chris LRO meant well but I thought it important – for the sake of those operators at 2012L who gave up their normal lives and who worked extremely hard, 24/7 for over 6 weeks – to correct any mistaken impression on Chris' part.

The 2012L story is in this issue on p24. **Ed.**

John Wightman, ZL1AH, ex-2AOV, ex-G3AH (1937 - 1950)

I was sad to see my old friend, G2HW, had joined the ranks of the silent key fraternity. I first met him in 1936, when I arrived home from after playing soccer on a Saturday afternoon. He lived in digs at Stretford, about three miles from my home and was out walking when he spotted my antenna's Zepp feeder, pre full licence (don't ask!). He knocked on the door and was drinking tea with my family, when I arrived.

We were both regular attendees at the RSGB monthly meetings in Brookes' Cafe, Shudehill, Manchester (destroyed in the December 1940 Blitz) and, like me, Harry was a regular at the NFD operations, Grant's Tower, north of Bury, Lancs.

In recent years we have had a number of contacts on 30 metre CW and Harry was always good for a ragchew.

POSTAGE RULES

David E Mappin, G4EDR

As one of the volunteer QSL Bureau Sub Managers of the Society I always take a keen interest when the subject of QSL card postage costs is raised.

I refer to the letter from Keith, G6DZH published in the November 2012 issue of *RadCom*. Keith says in his letter that "For QSL returns I use a standard 10" x 7" to which a second class stamp is affixed, maximum weight 100g, maximum thickness of envelope and contents 5mm...".

The maximum envelope size that falls into the category Royal Mail call a 'letter' is 240mm x 165mm (9.4" x 6.4"). On this occasion I believe Royal Mail were correct with the underpayment request as Keith's envelopes are 10" x 7".

In Keith's letter he says that he contacted Royal Mail to enquire what the charges for a second class A6 stamped envelope would be. Given that the envelope would probably be C6 sized at 162mm x 114mm (slightly larger than A6) this would clearly fall into the 'letter' size. Royal Mail would have correctly quoted the 'letter' size postage but in reality Keith uses an envelope size that falls into the 'large letter' category.

Keith was possibly lucky with the outcome on this occasion but could find the same situation arises with his next batch of envelopes.

Bruce, GW8AAG

I am indebted to Keith, G6DZH (Nov 2012) for telling us about his problem with Royal Mail and erroneously surcharged 'letters'. Should I receive an invitation card to visit my local Delivery Office (10 miles away) I shall take the precaution of packing a digital caliper, a new 5mm drill bit (not to create a mischief but to show the caliper works correctly!), a metric rule, a small kitchen digital scale and a 100g weight. The latter may be difficult to procure but I can but try to make one from lead sheet and test it against a Post Office weighing machine.

Gill, G0AOL

Reading this months' letter from Keith, G6DZH prompted has me to relate my recent experience of Royal Mail.

I sent my usual pack of 6 SAEs to my sub-manager, Keith, G4BYY, shortly after receiving the last batch from him. About three weeks later I received a phone call from Keith asking if I was OK as he hadn't heard from me. Keith knows I always write/send envelopes promptly after receiving a batch so he was worried as he had not heard from me.

It turned out that my package had gone 'missing' in the post. I filled out the usual claim form but was surprised to have it refused as Royal Mail said it was 'too early' (it wasn't) and they said I had to provide proof of the value of the lost items. Seemed odd, as they know the price of stamps (they set the prices!) but I duly sent them back receipts for both stamps and envelopes.

So I was shocked to receive yet another letter a week or so later, declining to pay my claim as stamps are, apparently, not covered by their compensation scheme. I have to wonder why they did not tell me that in their first letter? They also declined to pay for the lost envelopes and paper, so I have had to write to them a third time pursuing this.

The moral of the story is this: should the Bureau continue to be operated in such a way as to oblige thousands of us to send batches of expensive mint stamps in the open post? Royal Mail suggested that I should use Special Delivery in future. However that costs a minimum of £5.90 (100g) so would make collecting my QSLs rather too expensive.

For those that will say, why not use eQSL etc. Part of the fun of amateur radio for me is receiving cards written by other hams across the world. An e-mail is just not the same.

TECHNICAL READING

Greg Smith, ZL3IX (G3ZZI)

I completely agree with G3RZP on the matter of the N7ZWY article, and completely disagree with G4OWY.

This was an excellently written article, which I really welcomed seeing in *RadCom*. Not very much has been written about Norton amplifiers and their derivatives, even in professional literature, and this article provided not only the background to Norton's original design, but some very interesting recent developments as well. Any radio amateur who is interested in highly linear Rx design would have found the material useful.

The editorial staff of amateur radio magazines try to satisfy a readership with very widely varying technical capabilities and it is difficult to decide how technical the content should be. One particular, well-known magazine, originating across the pond, has been dumbed down so much that it is hardly worth reading today. I am glad *RadCom* is not following this route.

RADIO SECURITY

Michael Lynn, G1KOT

I want to raise the subject of radio security to various manufactures of amateur radio equipment. Why is there a lack of options?

I remember a while ago that there was a general Request For Comments for what we wanted in the next generation of amateur equipment. Was security not thought about? Working in the IT sector we look at various ways to stop things from going walkabout, and with equipment nowadays being in the excess of £5k, what is in place to try and make people think twice about stealing? Why do we not have PIN codes on most new radios? How about Kensington lock options for equipment in the home. Surely a more secure radio is also a positive selling item. Not that I've come from a position where I've had the misfortune of having any equipment stolen. But I'd always like to approach something before the horse has bolted and a push from manufacturers to make things a little harder for people who take opportunities

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.

to relieve us from our equipment and interesting hobby.

THINK FIRST BEFORE SPEAKING

Krystyna, M6KSH

I am writing to provide a 'shot across the bows' to your readers who call 'pirate' on the air to other licensed radio amateurs. As a Registered Social Worker, I feel it is right and proper to challenge what happened.

Such an incident occurred in October, when a club member visited the Sheffield ARC chairman. This club member has a mild learning difficulty and it took him a year to achieve his Foundation. His details are on QRZ and in the RSGB Yearbook. He was encouraged by the club chairman to start calling CQ on 40m, because he is very nervous. An on air radio amateur then retorted, without giving their callsign, to not respond claiming the club member was a pirate. The club chair, Steve, M1ERS, intervened and asked for their callsign. Naturally, he was steaming, an explanation given and the amateur did not respond.

The consequence of this retort is that our club member didn't want to continue calling CQ, despite encouragement from other on air amateurs. It will take us several weeks or even months to rebuild the damage caused by the amateur who made this ill thought out claim and failed to give their callsign, and thus breached their own licensing conditions.

The message to your readers, and that amateur if he is reading this, is simple. Think before you open your mouth! Any new or inexperienced licence holder is likely to sound like a pirate until they build up their confidence and experience and, I have to say, I have listened to some very experienced unlicensed operators on 11m so this would be an insult. There are resources available online to help determine if someone is licensed; calling someone a pirate is not one of them. I hope the person responsible is reading this, as we'd sure love an apology that we can pass on to our club member.

RSGB CONVENTION

Stewart Rolfe, GW0ETF

I attended my first RSGB Convention this year (13/14 October) and found the weekend most enjoyable and interesting.

The one night all inclusive package seemed very good value, and usefully included transfers from and to Milton Keynes rail station. The RSGB team did a great job, even going out of their way to make sure I was reimbursed when a misunderstanding with the hotel resulted in me paying for my own taxi on arrival. Horwood House is a superb location even though some of the meeting rooms were put under strain on the Saturday by the sheer numbers wishing to see the presentations.

The RSGB and Horwood House between them organised an excellent weekend, and it was fun finally meeting face to face with some of those individuals previously only known to me as callsigns and names in a log.

Stewart, I'm glad you enjoyed your first RSGB Convention and God willing look forward to seeing you at next year's event. In the past many RSGB Members, and amateurs, for whatever reason viewed the Convention as 'not for me' but I have to say thanks to the varied programme, which literally does now include something for everyone, the event goes from strength to strength, more and more people are trying it and are liking what they see. Remember we are all radio amateurs together and those names that you read about in RadCom *and other places are only too happy to meet and chat with people who share a passion for this great hobby. So, unashamedly let me plug the 2013 RSGB Convention - planning has already begun.*
Dave, M0OBW,
RSGB Convention Organiser.

OFCOM & THE OLYMPICS

Graham, G4DPH

In addition to the amateurs involved with the Olympics this year named in page 8 of the November *RadCom*; other amateurs may have been involved including myself (other than the Ofcom staff who are licensed... which should remain conficential as they don't wish their professionalism to be compromised when involved in amateur radio issues involving the public/amateurs). Both myself G4DPH and G4CXQ were recruited to work during the games. The details are:

Graham Jones, G4DPH. Testing & Tagging and Spectrum Engineer in the West London team. Covering Wimbledon, Earls Court Stadium, Wembley Park & Wembley Arena.

Dave Dyer, G4CXQ. Involved in Testing & Tagging, and Spectrum Engineer for both the Olympics and the Paralympics in the Main Olympic Park and Village.

It was also interesting to note the high percentage of overseas Spectrum Engineers from their national equivalent of Ofcom who also held amateur radio callsigns.

MOXON CLAW REVISITED

Peter Chadwick, G3RZP

VK6APH's article on the Moxon Claw Revisited is interesting. There is, however, an error in describing the device as a 'variometer'. A variometer is a variable inductance, in which the two coils are in series and rotation varies the total inductance from L1 + L2 + 2m to L1 + L2 – 2m, where M is the mutual inductance. It has the disadvantage that the Q varies with inductance, being minimum at minimum inductance.

The device described by VK6APH is actually a 'variocoupler'. A full description of both may be found in the relevant parts of Harmsworth's Wireless Encyclopaedia of 1924 (it tells me that 'Harmsworth's Wireless Encyclopaedia is an indispensible adjunct to every wireless enthusiast'...) Published in weekly parts at 1/3d – about 7p, which was quite a lot then.

TALKING TO CLUBS

John, G1AWJ

I note that RadCom is promoting Gillian Cookson's *The Cable - Wire to the New World*. Since retiring from both engineering and medicine, I am researching for a PhD to keep the grey cells working! My subject is the maintenance of Victorian submarine cable telegraphy. I have also been associated with The Telegraph Museum at Porthcurno for a decade.

I have already spoken at regional meetings of the Institute of Measurement & Control, Milton Keynes & DARS and a number of other groups. I would be happy to speak at meetings of any interested groups about the history of submarine cable telegraphy in general or about more specific areas such as the location and repair of cable faults and breaks.

PARTICULARS WITHELD

David Pratt, G4DPM/ G3KEP

I welcome the move in the last two editions of the *RSGB Yearbook* to list in a section in the back all the callsigns whose holders do not wish their callsigns to be included.

When hearing a UK station I am often tempted to glance at the callbook to see where they are. If the call is not listed I am inclined not to call because of the possibility of the callsign not being legitimate. What puzzles me is why so many people do not have their details in the call book, yet their full address information is on qrz.com for the world to see.

I would urge anyone whose address is not in the callbook to write to Ofcom to get it included. Additionally, if you work any one not included, urge them to do likewise.

New Model! FUNcube Dongle Pro+

This is a complete redesign. To give you a flavour, the new FCD has well over twice as many parts in its bill of materials, (240 discreet components in fact!) To cater for this, the board is now a six-layer design (the original FCD was only double sided). To fit these extra parts in, they are soldered on both sides of the PCB. There are no fewer than eleven discrete front end preselection filters, including some serious SAW filters specifically chosen for the 2m and 70cm amateur bands. But that is just the start...

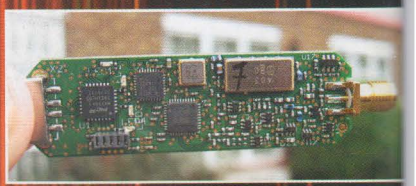
- Coverage is from 150kHz (yes, that's kHz) to 1.9GHz.There is a gap between about 250MHz to 410MHz. There isn't a gap anywhere else.
- Eleven discrete front end filters, including some really, really serious SAW filters for 2m and 70cm
- 0.5ppm TCXO
- Much improved phase noise
- Better Dynamic Range by up to 7dB
- Tuner PLL Steps from memory
- All this plus more and still no drivers required!

Designed and built in Great Britain

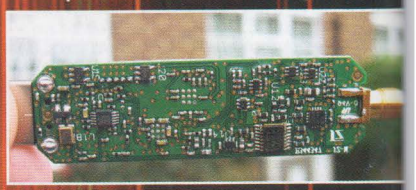
This remarkable memory stick-sized device was conceived, designed, built and bought to market by its inventor, Howard Long G6LVB.

After the worldwide success of the FUNcube Dongle, many of you have noticed that we've been out of stock and waiting for new deliveries. Howard Long, the FUNcube inventor decided to take into account feedback by many FCD users with a redesign he is calling the FUNcube Dongle Pro+. Howard thinks that you will find that the results are very worthwhile (actually so do we!). There are many enhancements both in performance, extended range and features.

INTRODUCING THE EXTENDED RANGE VERSION, the FUNcube Dongle Pro+.



Close up view of the internal construction of components mounted on a 6-layer PCB



For up to date information and resources see: www.hamradio.co.uk/funcube

The price is only £149.99