RadCom

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

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NUMBER 09
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09 12

Olympic Success

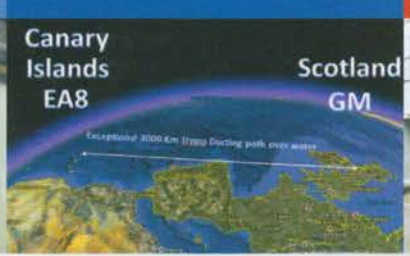
Flagship Olympic Stations are true champions

ATV

ID, test cards & captions

VHF UHF

3,000 kilometre tropo path



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HF High Performance Transceivers

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 with superb receiver inc. dual roofing filters, Auto ATU, 32 bit f/p DSP & USB PC connection.

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-7700 HF Transceiver

The IC-7700 HF/50MHz 200W transceiver shares many features with its "big brother", the world famous IC-7800. With two independent DSP units, a +40dBm 3rd order intercept point and ultra wide dynamic range to name but a few of the features.
IN STOCK £6364.95 D

TEN-TEC OMNI-VII-588 HF Transceiver

Fire it up and you immediately know you are driving something different. The receiver is a delight and the transmitted audio is superb. This 100 Watt transceiver that covers 160m - 6m. Ethernet remote control ready.
IN STOCK £2699.95 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 SignaLink USB Sound Card Radio Interface+ CD-ROM with 4 pin round mic cable
SL-USB-8R SignaLink USB Sound Card Radio Interface+ CD-ROM with 8 pin round mic cable
SL-USB-RJ-11 SignaLink USB Sound Card Radio Interface+ CD-ROM with RJ-11 mic cable
SL-USB-RJ-45 SignaLink USB Sound Card Radio Interface+ CD-ROM with RJ-45 mic cable
SL-USB-5PD SignaLink USB Sound Card Radio Interface+ CD-ROM with 5 pin din cable
SL-USB-8PD SignaLink USB Sound Card Radio Interface+ CD-ROM with 8 pin din cable
SL-USB-13PDI SignaLink USB Sound Card Radio Interface+ CD-ROM with 13 pin din for Icom
SL-USB-13PDK SignaLink USB Sound Card Radio Interface+ CD-ROM with 13 pin din for Kenwood
SL-USB-6PMD SignaLink USB Sound Card Radio Interface+ CD-ROM with 6 pin mini din
SL-USB-NC SignaLink USB Sound Card Radio Interface+ CD-ROM with unterminated radio cable

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

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Heil Pro-Set-3 NEW
Studio Headphones

Amazing performers! Superb fidelity & audio reproduction. Excellent isollation from outside sounds. Also work great on iPod etc. We have not heard this quality at this price before!
£109.95 C

We are now the official UK distributor for both Heil Ham radio and Pro microphones. Check out www.heilmicrophones.co.uk for the complete professional range.

Pro-Set-6

The new Pro-Set-6 headset offers a complete new way of operation with its comfortable headset and adjustable boom mic. giving hands-free operation.
Pro-Set-6 £149.95 C
AD-1 Rig adaptor leads £22.95 C

HM-12
The HM-12 features the new HC6 insert that works with all modern rigs. It will give your signal that "magic" lift that will add dBs to your signal's voice power. As Bob says in his live workshop, a linear costs a whole lot more! Check out our great price of **just £69.95 C**

Interchangeable Adaptor lead for your radio is extra. Phone for price of the adaptor you need to exactly match your radio. Get one for each radio.

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 placem ent 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 £22.95 C

YouKits QRP 80-40-30-20m CW Transceiver

HB-1B QRP Transceiver
This little CW 80, 40, 30, 20m transceiver runs 6 Watts from ext. 12v or 4W from optional internal lithium cells. Has tunable filter 400Hz-3kHz, electronic keyer, programmable auto CQ, 30 memories, switched tuning speeds. Also receives SSB from 3.4 - 16MHz.
IN STOCK £249.95 D

New Kenwood TS-990S

The New FlagShip Radio From Kenwood

The new radio from Kenwood covers 160hm to 6m and has an output of 5-200W. The AC supply is included and the rig even features PSK-31. It's a big desktop design and the US$ price is expected to be $5K - $8K. So it is at the top end of the price range. There are no firm delivery dates yet, but it is hoped to have one working at Newark in October. PX welcome!

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 **£479.95 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**

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Radio has never been cheaper in real terms but that does not helpi 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-E90 Triple band 2m 6m 70cm + wideband receive 500kHz-1GHz **£244.95 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**

HF - UHF in One Box!

YAESU **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

KENWOOD
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**

ICOM **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!

YAESU **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

ICOM **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

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

TEN-TEC **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

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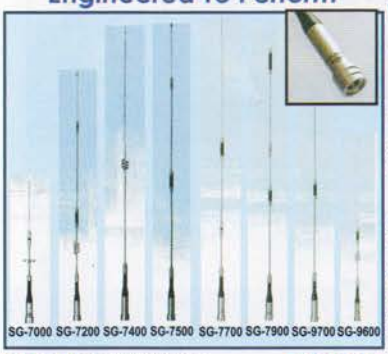
DIAMOND ANTENNA

Engineered To Perform



SG-2000	2m/5.2dB 1.59m	£84.95 C
SG-7000	2m/70cm 2.1/3.8dB 0.47m	£66.95 C
SG-7200	2m/70cm 3.2/5.7db 0.96m	£82.95 C
SG-7400	2m/70cm 2/5.5dB 0.99m	£71.95 C
SG-7500	2m/70cm 3.5/6dB 1.06m	£72.95 C
SG-7700	2m/70cm 4.3/6.8dB 1.27m	£92.95 C
SG-7900	2m/70cm 5/7.6dB 1.58m	£104.95 C
SG-9500M	2/70/23cm 3/6/9.7dB 1m	£96.95 C
SG-9600	6/2/70cmdB 0.82m	£86.95 C
SG-9700	6/2/70cm 0/3/5.8dB 1.07m	£92.95 C

Diamond Mounts

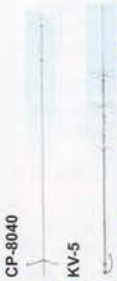
K-11 Gutter mount adjustable tilt £36.95 A
K-600M Trunk lip adjust + cable £66.95 C
K-33 Hatch Mount adjustable £43.95 A

K-400 Heavy Duty Hatch mount £39.95 A
CRM Roof rail / Mirror Mount £14.95 A
K-512 Roof bar mount £44.95 C
ECH 5m cable kit PL-259 £12.95 A

DP-7RH Compact 40/30m Dipole

This is a rigid, telesopic dipole, which has an overall length of approx. 3.5m. It collapses down to pocket size. It can be hung from a tree or clamped to a mast. SO-239 feed.
£134.95 C

HF Verticals



CP-6 80-6m 200W with 1.8m rigid radials. Mast mounted. 4.6m long £359.95 D

CP-8040 80-40m with 1.8m rigid radials. 6.5m long. £399.95 D

KV-5 80-40m ground mounted vertical approx 6.5m long. £339.95 D

SD330

80-6m Remote Tuned Whip

This "screwdriver" design covers all the DX bands (inc WARC0. Continuously tuned with supplied remote control, it will handle 200W and is just 1.85m long. Fitted 3/8" stud mount, it will easily fit onto a 3-way magnetic roof mount. £429.95 D

NEW LOW PRICES From UK Distributors!

Diamond VSWR Meters

SX-100 HF 3kW
1.6 - 60MHz 30/300/3kW FSD. 3W sensitivity for FSD. Single sensor 0.1dB insertion loss. PEP/RMS £99.95 C

SX-200 1.8 - 200MHz. 5/20/200W FSD. 1W sensitivity for FSD. Single sensor. 0.15dB insertion loss. PEP/RMS £94.95 C

SX-400 140 - 525MHz. 5/20/200W FSD. 4W sensitivity for FSD. Single sensor. 0.2dB insertion loss. PEP/RMS £99.95 C

SX-600 HF-UHF
1.8- 160MHz / 140-525MHz 5/20/200W FSD. 1W/3W sensitivity for FSD. Dual sensors 0.2dB insertion loss. PEP/RMS. £169.95 C

SX-1100 1.8 - 160MHz. / 430-1300MHz 5/20/200W FSD. 1W/4W sensitivity for FSD. Dual sensors. 0.15dB insertion loss. PEP/RMS £239.95 C

Diamond Power Supplies

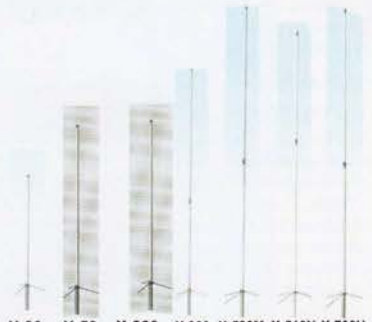
GSV-3000
30 Amps continuous 1 - 15vDC variable 250 x 150 x 2400 mm inc. DC cooling fan, weight 9kg £194.95 C

GZV-6000 60A **GZV-4000** 40A

GZV-6000 60 Amps continuous 1 - 15vDC variable 210 x 110 x 3300 mm inc. DC cooling fan, weight 5.2kg £389.95 C

GZV-4000 40 Amps continuous 5 - 15vDC variable 210 x 110 x 3300 mm inc. DC cooling fan, weight 3.5kg £199.95 C

Base VHF/UHF Antennas



X-30	2/70cm 3/5.5dB 1.3m 150W	£57.95 D
X-50	2/70 4.5/7.2dB 1.7m 200W	£66.95 D
X-200N	2/70cm 6/8dB 2.5m 200W	£94.95 D
X-300	2/70cm 6.5/9dB 3.1m 200W	£104.95 D
X-520M	2/70cm 8.3/11.7dB 2.5m	£159.94 D
X-510N	2/70cm 8.3/11.7dB 5.2m 200W	£154.95 D
X-700H	2/70cm 9.3/13dB 7.2m 200W	£279.95 D

FlexRadio Systems® Software Defined Radios — Summer Discount Sale

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 . £1379.95 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 £2495 D + ATU £2745 D

Hustler Antennas

6-BTV	10-15-20-30-40-80m vert 1kW	£279.95 D
5-BTV	10-15-20-40-80m vert 1kW	£239.95 D
4-BTV	10-15-20-40m vertical 1kW	£199.95 D
RM-10	10m Standard resonator 400W	£21.95 C
RM-11	11m Standard resonator 400W	£21.95 C
RM-12	12m Standard resonator 400W	£21.95 C
RM-15	15m Standard resonator 400W	£21.95 C
RM-17	17m Standard resonator 400W	£26.95 C
RM-20	20m Standard resonator 400W	£26.95 C
RM-30	30m Standard resonator 400W	£29.95 C
RM-35	7-10MHz Std resonator 400W	£29.95 C
RM-40	40m Standard resonator 400W	£29.95 C
RM-50	5-7MHz Std resonator 400W	£29.95 C
RM-60	60m Standard resonator 400W	£32.95 C
RM-80	80m Standard resonator 400W	£32.95 C
RM-10-S	10m Super resonator 1kW	£29.95 D
RM-11-S	11m Super resonator 1kW	£29.95 D
RM-15-S	15m Super resonator 1kW	£29.95 D
RM-20-S	20m Super resonator 1KW	£34.95 D
RM-40-S	40m Super resonator 1KW	£42.95 D
RM-80-S	80m Super resonator 1KW	£56.95 D
MO-1	Mast section 54" folds at 22"	£39.95 C
MO-2	Mast section 54" folds at centre	£39.95 C
MO-3	Mast section 54" non-folding	£29.95 A
MO-4	Mast section 27" + 3 whip sections	£27.95 A

W3FF Buddipole Antennas

Mount your own DXpedition this summer! Full Range In Stock!

£219.95 D

* Frequency 40 to 2m * Power rating 250W * 2x 55cm alloy dipole arms * 1x dipole centre with 1/2in thread * 2x matched loading coils * Adjustable finger-tight coil taps * 2x 165cm telescopic end sections * Wrap around pouch and hard case * Full instructions * 7.62m (25ft) coax with balun * Packed size 68cm / 1.6kg
Note that photo shows the complete Buddipole with the optional tripod.

W3-BPT	Optional Tripod for W3-BP	£109.95 D
W3-BM	22" Telescopic mast for W3-BP	£74.95 D
W3-CTA	Center tee adaptor for W3-BP	£8.95 A
W3-BS	Buddistick Portable Ant 7-54MHz	£161.95 D

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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E-mail radcom@imotea.com

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

Flagship Olympic special event stations 2012L (pictured, operated by Wilf, G0WLF) and 2012W showcase the best of amateur radio.

Photo: Cray Valley Radio Society

News and Reports

Special Offer

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Technical Features

Regulars

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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) (individual & club) £47.00
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, G0NBI,
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, M0OBW (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, GM0ONX, 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, G0UGE, e-mail: rm4@rsgb.org.uk
Region 5 – V Ravenscroft, M0VRR, e-mail: rm5@rsgb.org.uk
Region 6 – M Harper, MW1MDH, e-mail: rm6@rsgb.org.uk
Region 7 – J Sneddon, MW0EQL, 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, M0IEO, e-mail: rm12@rsgb.org.uk
Region 13 – J Stevenson, G0EJQ, e-mail: rm13@rsgb.org.uk

SPECIALIST AREAS – CHAIRMEN & HONORARY OFFICERS

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
Andy Talbot, G4JNT, Chairman, Technical Forum, e-mail: tech.chair@rsgb.org.uk, www.rsgb.org/rsgbtech/about.php

General Spectrum & Regulatory Matters
John Gould, G3WKL, Chairman, Spectrum Forum, e-mail: spectrum.chairman@rsgb.org.uk www.rsgb.org/committees/spectrumforum/

GB2RS News Service Management
Gordon Adams, G3LEQ, GB2RS Manager, e-mail: gb2rs@ntlworld.com
(GB2RS news items should be sent to gb2rs@rsgb.org.uk)

HF matters
Ian Greenshields, G4FSU, HF Manager, e-mail: hf.manager@rsgb.org.uk

Intruders to the Amateur Bands
Chris Cummings, G4BOH, e-mail: iw@rsgb.org.uk www.rsgb.org/committees/honoraryofficers/intruderwatchcoordinator.php

IOTA Activity Programme
Roger Balister, G3KMA, IOTA Manager, e-mail: iota.manager@rsgb.org.uk, www.rsgbiota.org/

Microwave matters
Murray Niman, G6JYB, Microwave Manager, e-mail: mw.manager@rsgb.org.uk

Planning Advice
Stephen Purser, G4SHF, Chairman, Planning Advisory Committee, e-mail: pac.chairman@rsgb.org.uk, www.rsgb.org/committees/pac/planning-panel.php

Propagation Studies
Steve Nichols, G0KYA, Chairman, Propagation Studies Committee, e-mail: psc.chairman@rsgb.org.uk, www.rsgb.org/psc/index.php

Repeater and Data Communications
John McCullagh, GI4BWM, Chairman, ETCC, e-mail: etcc.chairman@rsgb.org.uk, www.ukrepeater.net

RSGB Awards
John Dunnington, G3LZQ, Awards Manager (Contact HQ in the first instance on 01234 832 715), e-mail: hf.awards@rsgb.org.uk, www.rsgb.org/operating/awards/

Training & Education
Steve Hartley, G0FUW, 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.

HEADQUARTERS STAFF

General Amateur Radio Issues
Carlos Eavis, G0AKI
E-mail: AR.dept@rsgb.org.uk
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)**
Elaine Richards, G4LFM or Giles Read, G1MFG
E-mail: radcom@rsgb.org.uk
Telephone: 01234 832 700, Option 3

GB2RS and Club News
E-mail: GB2RS@rsgb.org.uk
Telephone: 01234 832 700, Option 3

Sales department (membership, books and other products)
E-mail: sales@rsgb.org.uk
Telephone: 01234 832 700, Option 1

Subscription renewals
Telephone: 01234 832 700, Option 2

IOTA
E-mail: IOTA_HQ@rsgb.org.uk
Telephone: 01234 832 700, Option 5

General Manager
E-mail: GM.dept@rsgb.org.uk
Telephone: 01234 832 702

HEADQUARTERS AND REGISTERED OFFICE

3 Abbey Court, Fraser Road,
Priory Business Park, Bedford MK44 3WH,
Telephone: 01234 832 700
Fax: 01234 831 496

QSL BUREAU ADDRESS

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 ready 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.

GB2012 MV

This Olympic special event station for Manchester is being operated daily from Warrington ARC. They had a visit from RSGB President, Dave Wilson, M0OBW on Friday 27 July to mark the opening of the London 2012 Olympic Games. He was greeted by a huge turnout of club members and toured the multi station venue. During his visit, Dave did not take much persuading to don a headset and briefly work a contact on 40m. It created an instant pile up on the band! The other operators stepped in and dealt with those waiting to work the special event station whilst Dave toured the rest of the facilities.

Warrington club have been coordinating with West Manchester ARC as GB2012MW and South Manchester ARC GB2012MS to keep all bands active throughout the Olympic and Paralympic Games. The final day of operation will be 9 September.

RSGB Regional Vacancies

Are you the right person to stand for election to the RSGB Regional Council for 2013 – 2015?

Two vacancies exist on the Regional Council for the term 2013 – 2015 in Regions 8 and 9. Candidates for the Regional vacancies must be resident in the Region concerned and be nominated by Corporate Members resident in that Region. All retiring Regional Managers are available for re-election.

If you wish to seek nomination please e-mail GM.dept@rsgb.org.uk for the nomination papers. Completed nomination papers, with supporting signatures of five RSGB Corporate Members must reach RSGB Headquarters by 28 September latest. The list of candidates seeking nomination will be published in the November *RadCom* and a ballot held during that month.

For a discussion on what is involved, you can call RSGB President Dave Wilson on 07860 691 056.

The Olympic Dream

It is said that the Olympic spirit is about taking part rather than winning, but it is clear that in our two flagship Olympic Stations we have two true champions.

Just like their athletic counterparts, the organisers of the two stations have been working hard for a long time to make sure that they 'hit the ground running' and congratulations go to Glyn Jones, GW0ANA and the Barry Amateur Radio Society and Bob Treacher, M0MCV and the Cray Valley Radio Society for their tireless efforts to ensure that the stations took to the air on time and continue to delight visitors. These operations are a marathon rather than a sprint, however, and there is still time to both work and visit the stations. I have been able to visit both venues and could not fail to be impressed with the warm welcome I received and the enthusiasm and commitment of both teams of amateurs. Amateur radio at its very best.

The Olympic Games puts the UK in the spotlight with its vast world-wide TV and radio audiences and the thousands of visitors who have travelled here to share in the experience. Our Olympic stations allow us to showcase amateur radio, not just to the many thousands of our colleagues across the world who will want both 2012L and 2012W in the log, but to the public who visit and who will surely come away with a greater understanding of what amateur radio is about, and who may be inspired to join us.

Both our stations have been successful in securing the support of national and local politicians and anecdotal feedback suggests that their interest may lead to further opportunities for promoting amateur radio.

Raising our profile is an essential part of expanding our membership, but what does it take to convert an increased awareness of amateur radio into a commitment to become licensed and join the Society? Very often it is the first interaction with a licensed amateur that will be the defining factor but that initial spark needs to be followed up with practical advice, help and support. We all have our part to play in this, from the club who will provide a tutor and a mentor, to the Regional Team who will be making early contact with all new members to ensure that they are receiving the encouragement and support they need, to HQ staff who are also following up new members and making contact with those who leave the society (and, in many cases, amateur radio) to try and persuade them to rejoin.

I am pleased to be able to report that our membership numbers seem to have stabilised somewhat over the first six months of the year, but we have a long way to go before we can realise our Olympic dream of winning the battle against declining membership. A true challenge for Team RSGB!

Graham Coomber, G0NBI

Jane Hutt AM, Leader of the Welsh Parliament and Finance Minister making a QSO with 2012L.

Alun Cairns MP, Jane Hutt AM (Welsh Assembly), Councillor Eric Hacker, His Worship the Mayor of the Vale of Glamorgan with his wife Heather, Councillor Gwyn John, Vale of Glamorgan, Glyn Jones, GW0ANA, David Wilkins, G5HY, Kenwood UK and Shane Williams South Wales Manager Wernick (Cabin-Shack).

HF 1 & HF 2 operating on the non-WARC bands at 2012L.

VHF Manager

We are looking to fill this vacancy with someone who has an interest in the bands from 6m to 70cm. This is to continue the work of developing amateur radio interests as well as spectrum management in these important bands. The position is a voluntary post that is annually reviewed and appointed by the Board. It will require occasional attendance at meetings and events both within the UK and overseas; some of these take place during the normal working week, others at weekends.

The role will require a candidate with good knowledge of, and familiarity with, a wide range of usages of these bands as well as good interpersonal and communications skills for working both within but also externally to the Society. The manager reports formally to the Board and membership through a written annual report. Necessary on-the-job training and/or background to the spectrum management and IARU responsibilities can be provided.

If you are interested in applying or seek further information, please write to Graham Coomber, G0NBI, General Manager, by e-mail to graham.coomber@rsgb.org.uk

The National Radio Centre at Bletchley Park, Buckinghamshire was formally opened in July by Ed Vaisey MP, Minister for Culture, Communications and Creative Industries. Impressed by the displays, he said that the NRC will do an enormous amount to spread the knowledge about the history of radio and its continuing importance in the 21st century. A quick look at the guest book shows the impact that the NRC has had with amateurs from around the world in the few months that it has been open to the public.

The NRC is currently open on Thursdays, Saturdays and Sundays but we are keen to extend the opening times to 7 days per week. The RSGB relies on a small and dedicated volunteer team to welcome visitors and keep GB3RS on the air during the public opening times. Could you be another of the volunteers either operating the station, explaining about amateur radio to the public who visit or guiding visitors around the exhibits explaining more where needed? Whether you can offer 1 day a week or 1 day a month, your help would be most welcome.

We are looking for volunteers that, ideally, hold a Full amateur licence and who have a confident and articulate 'on-air' operating style, as well as any licensee who can describe the hobby or explain the many exhibits within the NRC. Full training will be given to all volunteers giving you the opportunity to join this group of dedicated amateurs who are doing a great job showcasing amateur radio to the public. If you live within reasonable 'commuting' distance of Bletchley (we will pay travel costs) and can commit to at least a day a month, please contact Carlos Eavis on 01234 832 715 or e-mail carlos.eavis@rsgb.org.uk.

Over the next two to three years we believe that the bureau will face unprecedented demands for its services, if the evidence of the incoming Royal wedding QSLs is anything to go by. Some eager Europeans have already made requests for GQ Jubilee cards, posting direct to the bureau! With 2,636 NoVs issued, we have yet to see the bulk of the UK station outgoing cards arrive. With the Olympic NoVs still in full flow the likelihood is that the effect will be very substantial over a long period.

We are grateful to the Worked all Britain - GX4WAB group for announcing no outgoing QSLs and that they do not require cards for the Torch Relay awards. Both London and Welsh Olympic stations (www.2012L.com and www.2012W.com) will not be 'QSLing 100%'. They have a range of alternative QSL options that can be viewed on their websites or QRZ.com entries.

It has always been very helpful to include a recent *RadCom* wrapper, showing your membership number and renewal date with outgoing cards, but now it's equally important for collection envelopes. Sub-managers need to identify new members, regional visitors, callsign changes and ownership of multiple permanent calls, especially where the user hasn't updated RSGB records, or their last known contact/e-mail is out of date. We urge all multiple callsign holders, especially M3/6, 2 and MO call holders to use the 'amend my details' link on the RSGB website, or to call HQ to confirm both current and any past callsigns, for QSL purposes www.rsgb.org/amend.

For QSL purposes, local clubs and now the many special interest and 'virtual' clubs also need to be affiliated or registered for the pay-to-receive service. To clarify, the personal membership status of the club's QSL manager, or call holder is not the important factor here it is the callsign that needs to be affiliated in the club or group name.

A significant upgrade to the submission process for the IOTA programme is expected to be launched later this year. In parallel with this important development the RSGB has been studying the longer term vision for the Programme. This has reached the point where we need a volunteer to take the work forward to the concept and implementation stages.

We are looking for a creative thinker and team worker who can develop a strategy for moving toward an online log submission process for the programme. The ideal candidate will need a background in IT systems architecture, knowledge of relevant programming languages and database applications.

This is a new post, which we expect to work on concept definition somewhat independently from the existing operational management of the programme and its IT support, with an ultimate goal of integrating the implementation of the new strategy with the operation of the current programme.

Please e-mail John Gould, G3WKL, g3wkl@btinternet.com for further information and expressions of interest.

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 A A Hickey, 2E0CKS
Mr R Rawlin, 2E0CMZ
Mr A Taylor, 2E0GPU
Mr H G Brown, 2E0HMY
Mr M J Hunt, 2E0JZT
Mr P Jay, 2E0PJY
Mr R T Robinson, 2E0RTR
Mr S C Walker, 2E1DBQ
Mr K Chell, G0SBE
Mr J Nicholson, G1OSI
Mr E Smith, G1XNS
Mr R H Williams, G4AGM
Mr C Crook, G6AFY
Mr C Holland, G6CBX
Mr H Kneale, G7MIP
Mr B G Baldwin, G7NRH
Mr S Eastwood, G7POT
Mr K Ballinger, G8BBP
Mr F Hennessey, HK3W
Mr G Sobalvarro, HK4GSL
Mr T Labani, HZ1TM
Mr T G Brooks Jr, K4TB
Mr R A Gist, K4VU
Mr M E Statom, KB0OLA
Mr T D Surman, M0BWF
Miss R Kelly, M0REK
Mr S Bell, M0SVB
Mr J Paradas, M0WTC
Mr G Collins, M3XXG
Mr P Waldron, M3ZKH
Mr J Holmes, M6AAO
Mr S Fiske, M6BRP
Mr JWR Morgan, M6BVV
Mr L Wale, M6BWJ
Mr Z Burningham, M6BWL
Mr S Davis, M6BWU
Mr L Clark, M6CBM
Mr M Jury, M6CVY
Mrs T Middleditch, M6DBO
Mr P Fletcher, M6DPF
Mr C Lonie, M6LJR
Mr D McHardy, M6LKQ
Mr N Rydings, M6NAE
Mr P Robinson, M6PRR
Mr Walker, M6RBW
Mr A Nisbet, M6SLN
Lady S P Robinson, M6SXI
Miss M Sonnenberg, M6SXW
Mr L J Allen, M6TGT
Mr K Middleditch, M6THM
Mr M J Weaver, M6WMP
Mr M Perry, M6YVV
Mr P Thompson, M0NAJ
Mr C Doherty, MI3APK
Mr C Matheson, MM6CMY
Mrs D Woodford, MM6ZDW
Mr B Teeson, MW6BVT
Dr B F Kuttikkate, MW6KFB
Mr W Davies, MW6WOD
Mr H S Kristensen, OZ2HSK
Mr J Codeco, PP5JY
Mr B C Chappell, RS204107
Dr D Cooke, RS208717
Mr A Bruton, RS208762
Mr P Briggs, RS209868
Mr D C Dallas, RS210916
Mrs T A Dallas, RS210917
Mr C Butler, RS211047
Mr J Bullock, RS211048
Mr J Barratt, RS211054
Mr J Stacey, RS211057
Mr J Grove, RS211090
Mr J O'Donnell, RS211093
Mr M Gilbert, RS211097
Mrs J Fletcher, RS211100
Mr J Uren, RS211112
Mr N Norsworthy, RS211113
Mr M Burrows, RS211115
Mr P Arnold, RS211129
Mr D A Barker, RS211131
Mr K King, RS211135
Mr D A Smith, RS211147
Mr A Zhao, RS211156
Mr B Troup, RS211168
Mr R V Silvester, RS211176
Mr J Petch-Harrison, RS211184
Mr N Jones, RS211225
Mr J Krupa, SP5APW
Mr T Chorwat, SQ9OZH

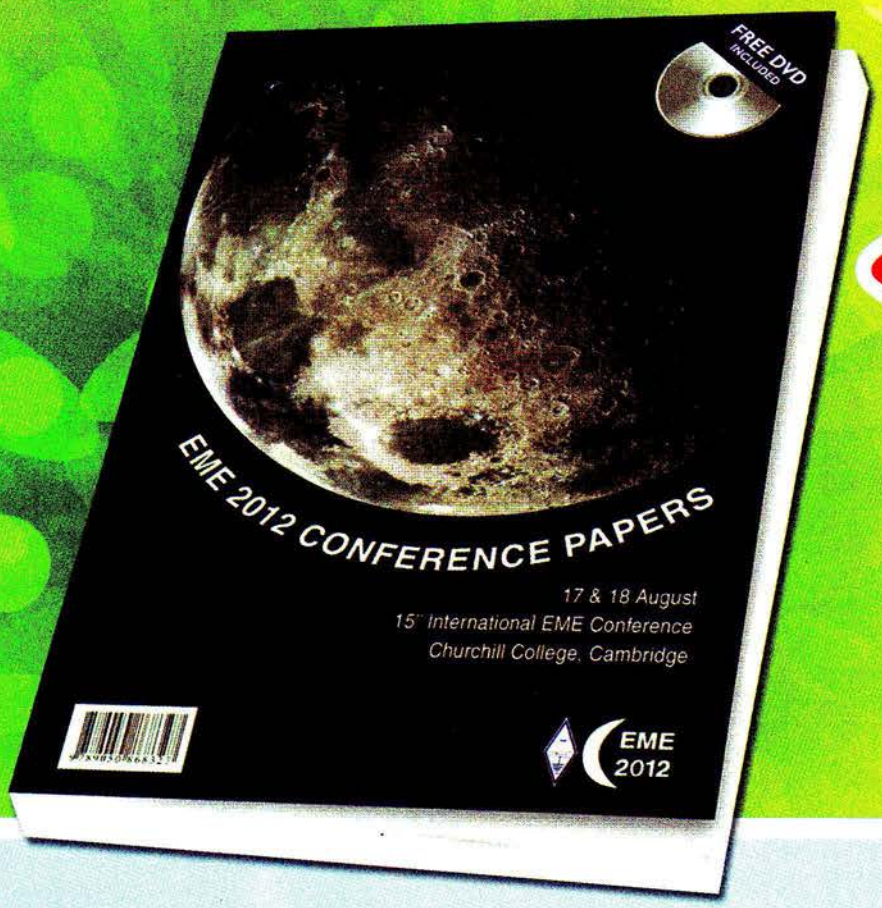
The RSGB would like to welcome back the following Members who have rejoined the Society.

Mr B C Marston, 2E0BCM
Mr P J Norman, 2E0BJP
Mr D Mathewson, 2E0IOG
Mrs C Mathewson, 2E0MTC
Mr P Pope, 2E0OSE
Mr SL Coleman, 2E0USC
Mr M Attfield, 2E0ZPT
Mr N O Bergstrom-Allen, G0AWH
Mr M D Bishop, G0GQT
Mr A Ryland, G0PTR
Mr D A Beasley, G1GLN
Mr P A Higgs, G1UJO
Mr J H Wilkins, G1WUY
Mr P F Hughes, G3OSR
Mr A Bensley, G3PTZ
Mr B Togwell, G4FTZ
Amateur Radio Caravan & Camping Club, G4RCC
Mr S J Melhuish, G4TJC
Mr A J Burge, G6ALB
Mr P D Lutman, G8YPN
Mr J Swinden, GW0NSZ
Mr J Jordan, M0JWJ
Mr M De Young, M3MDY
Mr P Banks, M3OSL
Mr P J Northover, M3PJN
Mr D L Aldred, M6DLA
Mr G Grant, MM0CUG
Mr J Wilson, MM0VEG
Mr J P Sanford, MW6TBP
Mr J Troup, WA6JYU
Mr D M Boresz, WA8SRA

The Society would like to apologise to Mr M K Chivers, M0JTN, whose callsign was listed incorrectly last month as M0GTN.

RSGB shop

P&P FROM FREE
see page 76 for full details



NEW

E&OE All prices shown plus p&p

EME 2012 Conference Papers

Edited by Ian White, GM3SEK

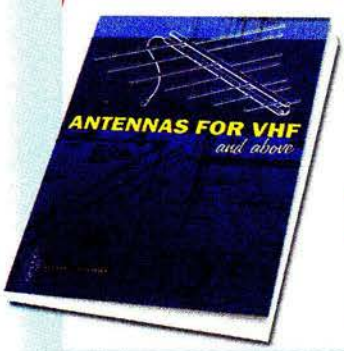
If you didn't get to attend 15th Earth – Moon – Earth International Conference in Cambridge, this book and DVD is simply the best way to catch up with the fascinating lecture programme that took place over the two days of the event. The book contains twenty two papers that cover a huge breadth of material from "how good were EME systems in the 60s and 70s" through topics on how to get the most from your EME equipment to what the future may hold for EME. If you are looking to read the fascinating "Gain Extra dBs from a Small Dish" article or about Charlie Suckling's G3WDG "A Novel Multi-frequency Downconverter for 13cm EME" and a host of other material then this book will not disappoint. There is even more as the book is supplemented by a **FREE DVD** that contains 24 expanded papers including two that didn't make the pages of the book, five multi media presentations and 15 folders of supplementary information. If you attended the conference or were not lucky enough to do so, or even if you are simply just interested in EME, this book is simply a must have.

ISBN: 9781 9050 8683 2 Size 210x297mm, 208 pages

Non Members' Price £17.99

RSGB Members' Price £15.29

OTHER BOOKS YOU MAY LIKE



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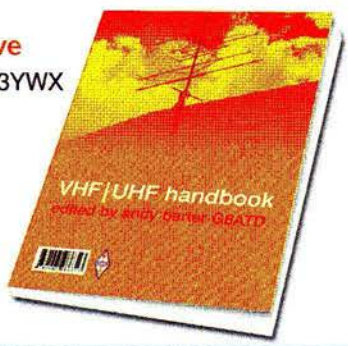

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Edited By Andy Barter, G8ATD
Price £12.74

Amateur Radio Astronomy

2nd Edition **Non Members' Price £16.99**
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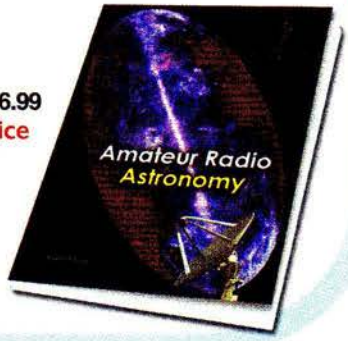

Radio Society of Great Britain www.rsgbshop.org
3 Abbey Court, Priory Business Park, Bedford, MK44 3WH. Tel: 01234 832 700 Fax: 01234 831 496

Contest Committee Chairman

The current Chairman of the Contest Committee will step down at the end of this year and applications are sought for a replacement. The role is largely an administrative one, overseeing the work of the team of volunteers who run the RSGB contests programme. The Chairman handles relationships between the Committee and RSGB, both HQ and Board, which includes matters such as co-ordinating trophy presentations and preparing material for the Yearbook, Annual Report and websites. Much of the Committee's work is done by e-mail, though annual meetings are also held. The Chairman is responsible for steering Committee discussions and achieving resolution of any issues. The Chairman is also the first level of escalation when a contest entrant raises a matter of dispute. The term of office is three years in the first instance. Expressions of interest, including a relevant CV, should be sent to the General Manager, GM.dept@rsgb.org.uk, by close of play on 1 October 2012.

Terry Stevens, G8DKS, RSGB VHF Manager, SK

It is with sadness that we report that Terry died on Sunday 8 July 2012. The Society has extended its sympathy to his widow, two grown-up children and his wider family.

Born in 1948, Terry passed the RAE when he was 14 years old and was on the air as G8DKS from the early 1960s. He has ever since kept a keen interest in the VHF and UHF bands, though has had to fit this in around a busy and varied professional career. Initially this was as a systems engineer, which saw him travel widely as well as run an operation in the USA. More recently with his wife he created a company that provides control systems for the paper industry.

Terry applied for and was appointed VHF Manager earlier this year and only a couple of weeks before his death Terry was enjoying a private visit to the Friedrichshafen Ham Radio event. We knew that he was a fluent German speaker, but several there we amazed at his command of Swedish, Russian and French. He had also planned a holiday visit to Lithuania later in July, and was to give presentations on the RSGB and the Enigma/Bletchley Park story at their Hamfest.

Contest General Rules Consultation

The RSGB Contest Committee is holding a consultation on the new General Rules, which it proposes to introduce from 1 January 2013. These will consolidate and update separate HF and VHF rules, which are applicable to most RSGB contests. The consultation will begin on 13 August, ending on 16 September and is open to all RSGB members.

The system used will be similar to that used for a number of previous consultations, with a moderated forum, and topics suggested by moderators or users. It will allow contesters to discuss the new proposals from the committee, to understand the effect of the rules and to propose changes for general discussion.

The committee will use this or a similar system to bring other points to contesters for debate. The experience gained in this consultation will be used to formulate and shape the way that this might be done in future.

A draft proposal for the new rules can be seen by following the appropriate consultation link from www.rsgb.org/consultations/. This draft is to be used as the starting point for the consultation and the webpage gives information and links to access the consultation.

CONGRATULATIONS

To the following Members whom our records show as having reached 80, 70, 60 or 50 years' continuous membership of the RSGB.

80 years	
Mr R E Wilkinson	G0BXB
70 years	
Mr E J Holmes	G3ALK
60 years	
Mr K H Coates	G3IGU
Miss J G Fish	GM3NYG
Mr A L Mynett	G3HBW
Mr D M Pratt	G4DMP
50 years	
Mr D Carden	G3RIK
Mr R J C Davey	G8MRI
Mr R Hargreaves	G3XZQ
Mr A W Kendrick	G3RDW
Mr B J Payne	G4CJY
Mr M R Perry	G8AKX
Mr R P Smith	G3SVW
Mr A F Stagles	G3RBY

Errata

In The Beginnings of Radio Astronomy, P57, August 2012, Amateurs section, the date of publication of Jansky's discoveries should have read 1932, not 1920. Also, John Stanley Hey should have read James Stanley Hey. The editorial team apologises for these errors.

In the T-R Sequencer components list, the RSGB telephone number was listed incorrectly, for which we apologise. The number should have read 01234 832 700.

Training & Education Update

In April this year I was appointed as Chair of the new RSGB Training & Education Committee (T&EC) and my first task was to form a Committee. I was bowled over by the response, with over thirty people expressing interest in getting involved.

Rather than have one huge committee I formed a number of small project-based Working Groups, each with a nominated project leader. These project leaders are my formal T&EC members and, even though the Committee has yet to meet in the traditional sense, work has commenced and things are beginning to happen; most work is done over the internet, with face-to-face meetings being kept to a minimum.

The projects were identified based on the Committee's aims, which were directed by the RSGB Board (see T&EC webpage for more details).

Lots of work is going on in the background and it will take a little while before there are any outputs that will be visible to all. Here are some of the things that are being worked on:

- a complete refresh of the Train the Trainers course material refocused on encouraging new trainers to give it a try
- a comprehensive guide for trainers and assessors to complement the RCF Conduct of Exams booklet
- a list of existing training resources that can be used or adapted by all
- a list of training resources we currently do not have, with a proposal on how to fill the gaps
- a refreshed RSGB promotional video and/or a brand new video aimed at attracting newcomers to the hobby
- support to the wider RSGB IT revamp to help make the most of the new RSGB website from a T&EC perspective
- planning for a series of workshops to encourage new authors to write exam questions
- a Training & Education Forum at the RSGB Convention.

Two further projects are on the horizon but not currently being worked on: training for 'After Advanced' and working with the RCF on a 3-year review of the 3-tier Exam Syllabus. Those are expected to start in 2013.

In addition to initiating the projects work, I represented the RSGB at a meeting of the RCF Standards Committee where their Annual Report (insert link) content was agreed and the proposal was approved to recognise the Air Cadet Training qualification as equivalent to the RCF Foundation exam and assessment.

Steve Hartley, G0FUW, T&E Committee Chair

RSGB shop

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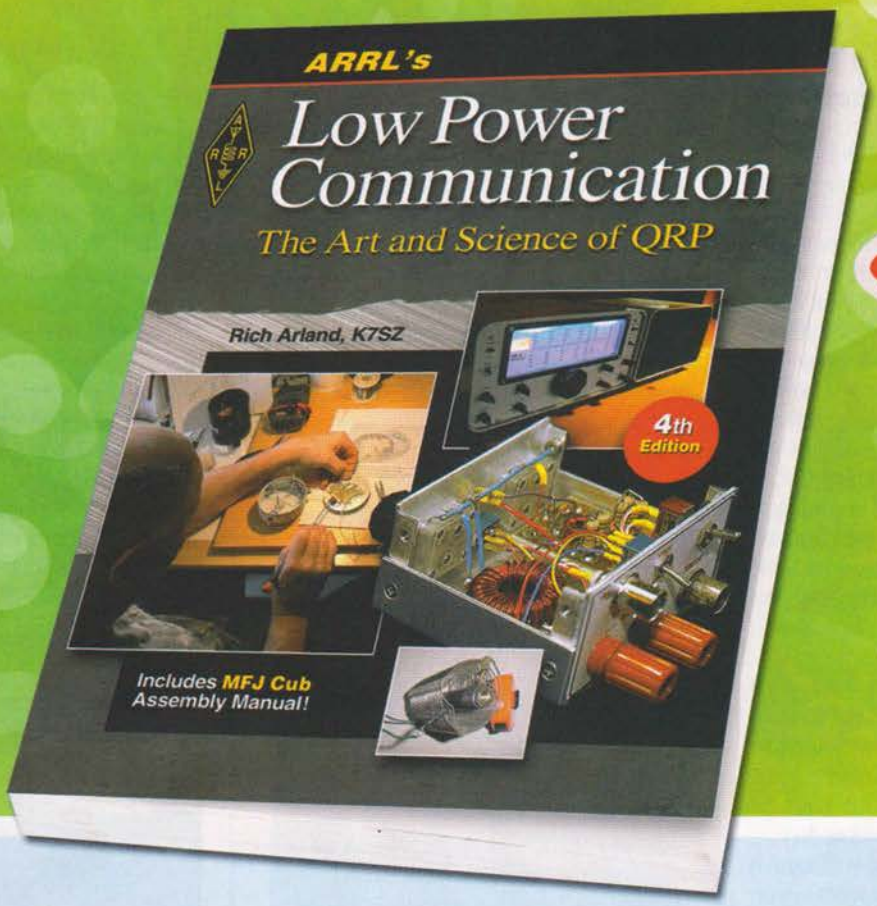
see page 76 for full details

NEW



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Richard Arland, K7SZ

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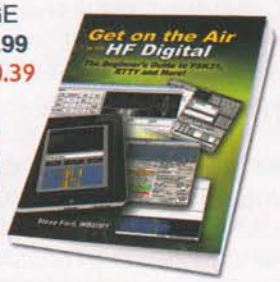

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Storm Warning

The Atlantic storm season runs from June to November and amateur radio continues to play a part in gathering and distributing information for the weather and emergency services each year. Radio amateurs in IARU Region 1 are reminded that the following frequencies may be in use by nets in North and Central America to track and deal with the consequences of these severe weather events. It is possible for Region 1 amateurs to cause unintentional QRM to these nets so please listen carefully if operating near these frequencies:

14.300MHz is used by the Maritime Mobile Service Net daily and as well as handling traffic from maritime mobile stations, also gathers weather reports from maritime stations to assist forecasters.

14.325MHz is used by the Hurricane Watch Net and the net is established whenever it appears that a storm may affect the US mainland. The net gathers weather information and links to the American National Hurricane Center.

14.265MHz is used by the Salvation Army Team Emergency Radio Network (SATERN) to provide health and welfare traffic links for those in affected areas as well as for supporting the Salvation Army Disaster relief response should a hurricane strike.

Frequencies used in Cuba:
7.045, 7.080, 7.110 & 3.740MHz
Mexico (FMRE): 3.690 & 7.060MHz
Cuba and Mexico co-operate with long distance relays on 40m when propagation makes this possible.
Frequency used in the Caribbean:
7.162MHz by the CEWN
Frequencies used in Central America:
Red Centro Americana:
7.090 & 3.750MHz
Guatemala: 7.075MHz
Nicaragua: 7.098MHz

Local emergency communications groups may also activate if a hurricane approaches their area and those frequencies would be announced at the time.

Railways on the Air

Railways on the Air (ROTA) will take place on 22 & 23 September and a new certificate is being introduced this year. As well as special certificates for any individual or group who activate a heritage railway during the weekend, any amateur who works five or more ROTA stations over the weekend will also receive a special personalised certificate for the shack. All certificates are issued once logs are sent back to Bob Dingle. E-mail Bob at bdingle@hotmail.co.uk.

RNARS Social

The Royal Naval Amateur Radio Society (RNARS) has organised a social event in Coventry and all are welcome. It will take place on 14, 15 and 16 September. The main event is a gala dinner on the Saturday evening and will include pre-dinner drinks and entertainment. On Saturday a coach trip from the hotel in Coventry to the National Memorial Arboretum is also to be run as part of the event. GB0CGT will be on the air from 80m to 70cm for the three days of the event.

Membership of the RNARS is not a requirement to attend this social event. Participants may attend the dinner only, or, stay one, two or three nights in the hotel. Details are on the Society website. Tickets can be obtained from Doug, G4BEQ (QTHR), e-mail g4beq@btinternet.com or call 02392 504 096.

Chiltern DX Club

On 21 July, at the Chiltern DX Club (CDXC) AGM, the Committee for the coming year was elected – G3NUG (President), G3SVL (Chairman), G3USR (Treasurer), G4LDL (Secretary), G3RFX (*Digest* Editor), G4AXX, G4FKA and G4PFF. Following the AGM, over 90 members and their partners enjoyed a BBQ in the sunshine at the QTH of Neville, G3NUG. A raffle was drawn with a top prize of an FT-450D donated by Yaesu UK, plus prizes from Martin Lynch & Sons, Nevada Radio, Kenwood and many more. John, EI7BA picked up the star prize in the raffle. More information on CDXC is available at www.cdxc.org.uk.

Chris, G3SVL, John EI7BA and Paul, G3WYW of Yaesu UK.

CHOTA

Churches & Chapels On The Air (CHOTA) takes place on 8 September. Cliff, G3UYNI will be activating St Keverne church in Cornwall using the callsign GB1SKC. For a full list of participating stations, go to www.wacral.org/CHOTA.htm.

10 years noise free!

DSP noise cancellation specialist bhi are celebrating 10 years in business and would like to thank all their customers, dealers and suppliers for their continued support over this period. bhi launched their first product, the NES10-2 amplified DSP noise cancelling speaker, at the Epsom radio rally in June 2002. Ten years later they have a full range of DSP noise cancelling products to suit most applications. To celebrate their 10 year anniversary, bhi will be running a sales promotion starting at the National Hamfest on 28 and 29 September, running through to 31 December. For more information check out the bhi website at www.bhi-ltd.com, contact one of bhi's authorised dealers or call bhi direct on 01444 870 333.

McMichael Rally

The weather was kind to all that visited the 2012 McMichael Radio Rally & Boot Fair in July. Pure luck some would say – it hadn't stopped raining for weeks, but the pause button was pressed for the entire day. As usual, Yaesu UK & Martin Lynch & Sons provided a brand new Yaesu FT-450D as a raffle prize, won this year by Robert Hanstock, G0LZB. Robert can be seen shaking hands with Richard Atcherley, the sales manager for ML&S and Min Standen the main organiser of the rally. There was an excellent turn out, with dozens of boot fair tables, traders and hot dogs!

NEWS IN BRIEF

• Donald, G3DNQ has created a website with a series of blogs detailing his life as a radio amateur as well as details of his various technical jobs. www.the-life-of.me.

Mountain Goat

An unlikely SOTA Mountain Goat is Martyn Johnson, M1MAJ. Living in Cambridge, Martyn is in one of the flattest and lowest parts of the UK and is significantly distant from the mountainous and hilly areas of Wales, Northern England and Scotland. So Martyn, often accompanied by Caroline, M3ZCB, has put in a great deal of time and effort in order to attain the target of 1000 activator points. Martyn began his SOTA campaign in the Yorkshire Dales back in 2003, with activations of Pen-y-gent G/NP-010 and Ingleborough G/NP-005. He finally attained the prized 'MG' status on Helvellyn G/LD-003. Just a few weeks later, Caroline, M3ZCB herself achieved Mountain Goat status for 1000 activator points. This was attained on the Welsh summit of Elidir Fawr GW/NW-005. On this activation, Caroline operated on 40m, 20m and 6m SSB, and on 2m and 70cm FM, logging 83 QSOs in a 5 hour stay.

Martyn on the summit of Ben Ledi GM/SS-023.

FISTS Silver Jubilee

The international Morse preservation society, FISTS CW Club, is celebrating its silver jubilee year. From 2 to 8 September they are holding a celebration week of activity. As it is a special occasion they are offering a non members award to the highest scoring entrant! The silver jubilee activity is not designed to be a contest style week, more a leisurely on the air event where CW aficionados can join in at whatever speed they're comfortable with and be welcomed by the membership. www.fists.co.uk.

Sir Bernard Lovell

Just as *RadCom* went to press, the Society learned that Sir Bernard Lovell had passed away, aged 98. He was the driving force behind the Jodrell Bank observatory, which included the country's largest radio telescope. This was renamed the Lovell Telescope in his honour in 1987 and, by coincidence, appeared on the cover of last month's *RadCom*.

QRP Accessories

The MFJ-9200 is a QRP transmitter capable of covering the 15 to 80m bands using plug-in filter modules. MFJ have now brought out a range of accessories to complement this transmitter. The Antenna Tuner covers 10-80m and handles 25W. The SWR/Wattmeter reads forward and reflected power in 3 ranges: 5, 30, 100W on a calibrated meter scale as well as reading SWR and relative power at any level 0-5W. The WattMeter/Dummy load has a built-in 50Ω dry load for testing your rig and gives reading to 5W full scale from 1.8 to 150MHz. The Balun is a 4:1 current balun. It has five way binding posts for your balanced line connection and a BNC output to your rig. The Artificial Ground electrically places a far away RF ground at the rig. All products are available from Waters & Stanton plc, www.wsplc.com.

Band Pass Filters

Array Solutions has just finished the production of a new range of band pass filters. These are suitable for Field Day operations and even DXpeditions. The units are two resonator top capacitor coupled filters with a VSWR less then 1.15:1 in the passband. The insertion loss is less than 0.3dB in the passband – typically <0.25dB (40m: 7dB to achieve -30dB rejection of the second harmonic). More detail can be found on the website www.arraysolutions.com/Products/as-bpffilters.htm.

Isle of Man DXpedition

Members of Sands Contest Group will be activating Isle of Man (EU-116) from 23 to 29 September. The group will use the club call MTOSCG and will be active on most HF bands using SSB and datamodes. The base location, Beach Cottage (IO74UH) is next to a small beach, close to the town of Ramsey at the NE end of the island. The operators will be Steve, G0TLQ, Hughie, G4UME, Paul, 2E0EET and Andrew, G0LWU. The group is likely to activate at least one SOTA summit during the week, probably on 2m FM.

AMSAT-UK Colloquium

The 27th AMSAT-UK International Space Colloquium will be held on 15 & 16 September at the Holiday Inn Hotel, Guildford, GU2 7XZ, close to the University of Surrey. Among the many notable speakers will be Dr Mark Hammond, N8MH from North Carolina, who will be giving two presentations.

The first will include updates on significant AMSAT-NA developments, including information about activities related to International Traffic in Arms Regulations (ITAR) matters (ITAR has had a damaging impact on amateur radio satellites). He will also provide a general and technical update about the Fox family of CubeSats.

The second presentation will address the challenges presented by the current trend of justifying satellite construction and launches through STEM (Science, Technology, Engineering and Maths) education.

The weekend event is open to all. It attracts an international audience that ranges from those involved in building and operating amateur radio satellites to beginners who wish to find out more about this fascinating branch of the hobby.

Further details www.uk.amsat.org/.

NEWS IN BRIEF

- From 4 to 8 October, the Martello Tower Group is visiting the island of Herm IOTA reference EU-114. The group will be operating two stations simultaneously on the bands between 80m and 10m using SSB and possibly RTTY using quarter wave vertical antennas. www.martellotowergroup.com/gp0pkt.
- The latest edition of The *5MHz Newsletter* is now online on Google docs at http://tinyurl.com/c86r3l4 and includes news on the ITU working party for the WRC2015 5MHz Agenda Item, plus technical correspondence on NVIS from Marcus Walden, G0IJZ.
- British Railways Amateur Radio Society is holding an International Railway Radio Amateurs Congress from 13 to 17 September. Currently nine European countries are attending. It is hoped to have a Special Radio Station operational sometime during the event.
- Hellenic Amateur Radio Association of Australia will be taking part in their ZL9HR DXpedition to Campbell Island between 28 November and 9 December. Campbell Island is 650km south of New Zealand in the Southern Ocean, IOTA OC-037. Keen DXers who may be looking to get ZL9 on a particular band and mode to move towards a DXCC or other award should go to the survey on the website at www.ZL9HR.com and vote for which bands and modes they would like to hear ZL9HR operating on.

RSGB Convention

Horwood House, 12 to 14 October 2012

LECTURE PROGRAMME. The two day lecture programme is almost complete and nearly all the lecture spots are filled with a diverse range of talks. Whether your interest is in DXing, VHF/UHF techniques, HF operating, propagation or technical matters, there will be something to interest you over the two days.

You can stay for the weekend on one of the many packages available or just come for the day – it's up to you. Day tickets are £6.50 and weekend accommodation packages start at £114.50.

To see a programme of lectures, check out the RSGB Convention website (www.rsgb.org/rsgbconvention). More detail on the lectures will also appear in the October *RadCom*. Once again we will be holding hands-on sessions throughout the day where Richard, G3AAT will help you understand the workings of some basic test equipment for your shack. Whether you've never had the opportunity to try out the test equipment or would like to find out if there's more you can do, Richard will be able to help. These are informal drop-in sessions and those who visited last year were pleased with the help they received.

One of the big highlights is the visit to the RSGB Convention of Jorge Prieto, HK1R, one of the leaders of the HK0NA Malpelo Island DXpedition. This was named DXpedition of the year 2012 at Friedrichshafen in June. Jorge has kindly agreed to do talks on both Saturday and Sunday to give as many amateurs as possible to learn more about this very exciting DXpedition. Of course, we will also be receiving talks from the T32C DXpedition team on their record-breaking DXpedition to Christmas Island last year. You can also look forward to a series of IOTA themed lectures too.

For those with an interest in technical matters, the introduction to using *SPICE* (*Simulation Program with Integrated Circuit Emphasis*) by Lee Hudson, M0LMH will be of interest. Originally developed for designing integrated circuits, this software tool simulates electronic circuits in a computer environment. The lecture is aimed at giving a basic understanding of how to use a typical SPICE package as a component-level prototyping tool to assist the amateur experimenter.

RadCom reviewer Peter Hart, G3SJX will be talking about HF transceivers, drawing on his extensive experience at one of the world's top reviewers.

For something a little different, how about Developing Small UAS for NLOS Applications - DARPA UAVForge Competition 2012 by Stephen Prior, Southampton University? The primary objective of this initiative was to design, build, and integrate technologies that would enable an air vehicle system to execute vertical take-off and landing with beyond line of sight observations. These capabilities could provide researchers, rescue first responders and other users a new and valuable tool. The winning team, based at Middlesex University, took their amateur licences as part of their preparations for the challenge that pitted them against some of the world's top engineers and universities. During the competition in the States they used 900MHz for data links, 5.8GHz for the video downlink and 1280MHz for a remote video feed.

Professor Mike Kosch will be visiting the Convention to talk about his research related to HF pumping of the ionosphere using a megawatt transmitter, coupled to radar and optical diagnostics.

The above are only a few of the lectures. Look out for other lectures from well-known names such as Ian White, GM3SEK, Andy Talbot, G4JNT, Paul Money, Mark Hill, G4FPH, Dave Edwards, G7RAU, Mike Richards, G4WNC, Steve Nichols, G0KYA and many more. More details are on the website, along with a provisional timetable.

The final timetable will appear in the October *RadCom*.

DINNERS. Friday and Saturday evenings will still be dominated by the dinners. On Friday, the ML&S Dinner is sponsored by Martin Lynch & Sons. On Saturday it is the DX Dinner. If you would like to reserve a table (10 places) at either dinner for you and your friends, please drop an e-mail to elaine.richards@rsgb.org.uk and we'll sort that out for you.

UK LICENCE EXAMINATIONS. The RSGB are offering those wishing to obtain a UK Amateur Radio Licence the opportunity to complete one, or more, of the required Radio Communication Examinations over the weekend of the RSGB Convention. Candidates must book their examinations prior to the event and must provide evidence they have completed the required practical assessments. The contact for further information and for booking examinations is the RCE Department at RSGB HQ on 01234 832700. Candidates for the Foundation or Intermediate examinations must contact the exams office so that their progress on practical assessments can be verified. If required, advice can be given on finding a local tutor to complete practical assessments in advance of the Convention. It is essential that Foundation and Intermediate candidates have their progress verified before the Convention.

US EXAMS. The US exams will be available on Sunday 14th. Candidates will need some form of ID, photo ID is preferred, a USA postal address for the FCC to send your licence, the exam fee, which this year would be the Sterling equivalent of $15 and a pen (but they usually have some available if necessary). For the self-study needed prior to the exam, there are many books available on the internet. Many websites will give you practice papers with answers. In fact, the whole of the examination question pool is available in the public domain and can be downloaded.

BOOKINGS. Tickets, hotel packages and evening dinner tickets can all be booked via www.rsgbevents.org. Horwood House is a Conference centre in the Buckinghamshire countryside, just eleven miles from Milton Keynes. It is signposted from the A421 whether you are travelling from Milton Keynes or Buckingham.

A popular lecture in the 2011 programme.

Principal sponsor Martin Lynch & Sons.

RSGB 2012 Convention

12 - 14th October 2012

Martin Lynch & Sons ML&S Principal Sponsor RSGB 2012 Convention

—2012— Highlights

- DXpedition of 2012, the HK0NA DXpedition
- Learn about research related to HF pumping of the iono sphere using a mega-watt transmitter, coupled to radar and optical diagnostics
- HF transceivers
- An introduction to using SPICE (Simulation Program with Integrated Circuit Emphasis). A software tool that simulates electronic circuits
- Developing Small UAS for NLOS Applications—DARPA UAVForge Competition 2012
- T32C DXpedition
- 10 Ways to Make Your Station Work Better
- Sun by Day, Aurora by Night
- Amateur Radio Direction Finding (ARDF)
- What is SOTA all about
- Getting in the Log, QSO Mechanics
- Next steps in Contesting
- Remote Operating
- ATV – Noel G8GTZ
- Datamodes, starting out
- The latest on optical Communications
- Log40M logging program explained
- DXpedition to Swaziland
- Microwave Recipes for the UKACs
- Raspberry Pi
- A review of the Olympic operations – how did amateur radio look?
- Propagation prediction programs and how to use them
- Contest logging software & how it works with the Robot
- Complex datamodes for beginner
- Antenna modelling with MMANA-GAL
- Techniques and software for assisting radio communications via Aurora
- The Design of a Range of 21st Century Equipment for the Amateur Microwave Bands
- Operating for DX on 160m
- VP6T DXpedition to Pitcairn
- Making a start on Microwave EME
- A little bit of Hydrogen Line Astronomy ... from the back yard
- Stresses in Cables and Towers
- 6dB better than CW. Weak Signal Modes – why and how they work

For further information or to book

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ATV

ID, test cards & captions

FIGURE 1: Three test cards: (left) traditional engineering type produced with *tcmaker*, (centre) '10 minute' homebrew card based on a photo, (right) a typical repeater ident card.

IDENTIFICATION. A question was raised by a novice ATV reader of this column about the licence requirements for giving your callsign when using a video transmission. The first thought was 'read your licence', but that has been open to interpretation even for a simple voice transmission. With television there are usually at least two simultaneous transmissions to consider; audio and video. The need for identification for both amateur and commercial TV transmissions opens up the subject of test cards, plus various forms of captions and inserted pictures.

First, the initial question regarding the use of callsigns. The current 'lifetime' amateur radio licence, Section 2, Part 13, Identification, is 'basic'. I recommend you re-read it occasionally, along with the rest of the licence. As clarified during a telephone conversion some years ago with a member of the (then) Radio Authority, it was stated that callsigns must be sent at the start and end of a *contact*, but it was not necessary to do it at the start and finish of every 'over', as long as the 15 minute rule was followed. Section 2, Part 11(4) is of note here, as it applies to 'net'/group operation.

There is no specific wording for 'video', but it does say that identification should be send on all transmission 'modes' and frequencies in operation. It is generally accepted that a visual form of the callsign should appear at least periodically on the video part of the transmission and be identifiable when the signal received is 'weak'/noisy.

WAYS TO ID ON VIDEO. The first G8CKN ID was an A3 card with felt pen writing, placed in front of the camera. Later, a PC software drawing package was used and the resultant picture files were displayed using a video output add-on for the PC. A very useful file viewer is *IrfanView* [1]. This has a carousel facility to show various types of picture and audio files. The simplest 'ident' can be produced using a character generator/inserter to print a callsign and other information such as location at a convenient position on the screen. One source of such a device is [2]. There are also comprehensive AV mixers that also have suitable ID insertion capability, picture in picture facilities and more, but these may be more appropriately discussed at another time.

The next step was to use a custom program, *PC-ATV* [3], that came with numerous TV test cards and the provision to add your own. Originally designed for the Commodore Amiga computer and then ported to the PC, *PC-ATV* also has a carousel facility. It is freeware, but a small registration fee gives the ability to insert custom callsign and locator information.

PRODUCING ID & TEST CARDS. Whilst searching for example test cards and commercial TV identifications [4], I came across *tcmaker* [5], a freeware program that enables you to produce standard and customised test cards. The example Philips PM 5544 test card on the left of **Figure 1** was produced with *tcmaker*. The program contains a comprehensive set of graphics 'blocks', pattern screens and other editing and insert facilities that can be used to draw a multilayer test card. Photographs and other pictures can be imported into the program. The test card is stored as a .tcd file that just contains the draw commands, so it is a very compact file – typically 3kB. Test cards can be viewed fullscreen or saved in .jpg or .bmp format.

An example of a '10 minute' ID card is at the centre of Figure 1. This was produced from a photograph using a simple drawing package. There are many test cards available via the web, however, unless they are in the public domain like those supplied with *PC-ATV* or *tcmaker*, there may be copyright issues. One source of test card/ident ideas are the ATV repeaters – and a number of repeater output streams can be viewed at [6]. On the right of Figure 1 is an example of a repeater ID card.

PRODUCING VIDEO. One way to produce a test card is to play it full screen on a computer and connect via a composite-out socket, if one is available. An alternative approach is to use an inexpensive standalone TV-out picture card viewer, such as the 'Dazzle universal TV photo show and card reader' or Currys C1STB11. These devices read a USB stick or camera memory card and output a TV signal, a bit like a digital picture frame that uses your TV as the display. These are often used by ATV repeaters to play a carousel of static images.

BATC CONVENTION & BiAGM. The BATC Convention and Biennial General Meeting takes place on 6 and 7 October. At the heart of the Convention is a lecture programme, with around 7 talks on Saturday afternoon and Sunday. Digital ATV will feature strongly. The BiAGM takes place at 11am on Sunday. The event is at Everest Community Academy in Basingstoke [7]; full details are at [8].

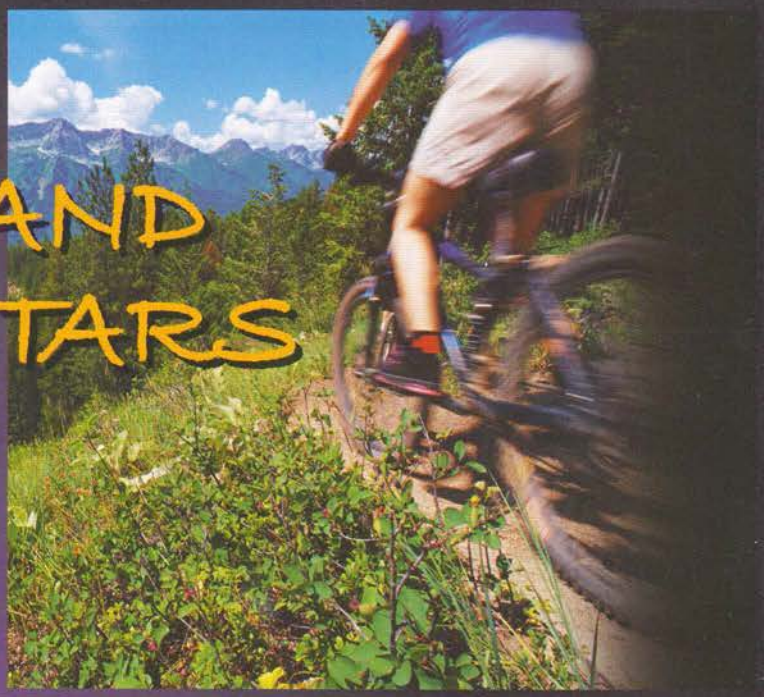
DEDICATION. This month's ATV column is dedicated to Den, G7NMA who asked the question about identification but sadly became a Silent Key on 10 June 2012.

WEBSEARCH

[1] www.irfanview.com
[2] www.blackboxcamera.com/pic-osd/pic-osd.htm
[3] www.pcatv.co.uk
[4] http://www2.tv-ark.org.uk/testcards
[5] www.oodletuz.fsnet.co.uk/soft/tcmaker.htm
[6] www.batc.tv
[7] www.everest.hants.sch.uk
[8] www.batc.org.uk/club_stuff/convention/index.html

ICOM

OFF-ROAD AND HIGHWAY STARS



ICOM's switchable IC-E80D VHF/UHF dual-band, digital handheld and ID-E880 mobile transceivers are both designed as D-STAR* entry-class models. ICOM have implemented the D-STAR repeater mode for improved user-friendly operation and long-distance communication over the D-STAR network.

Shared Features...

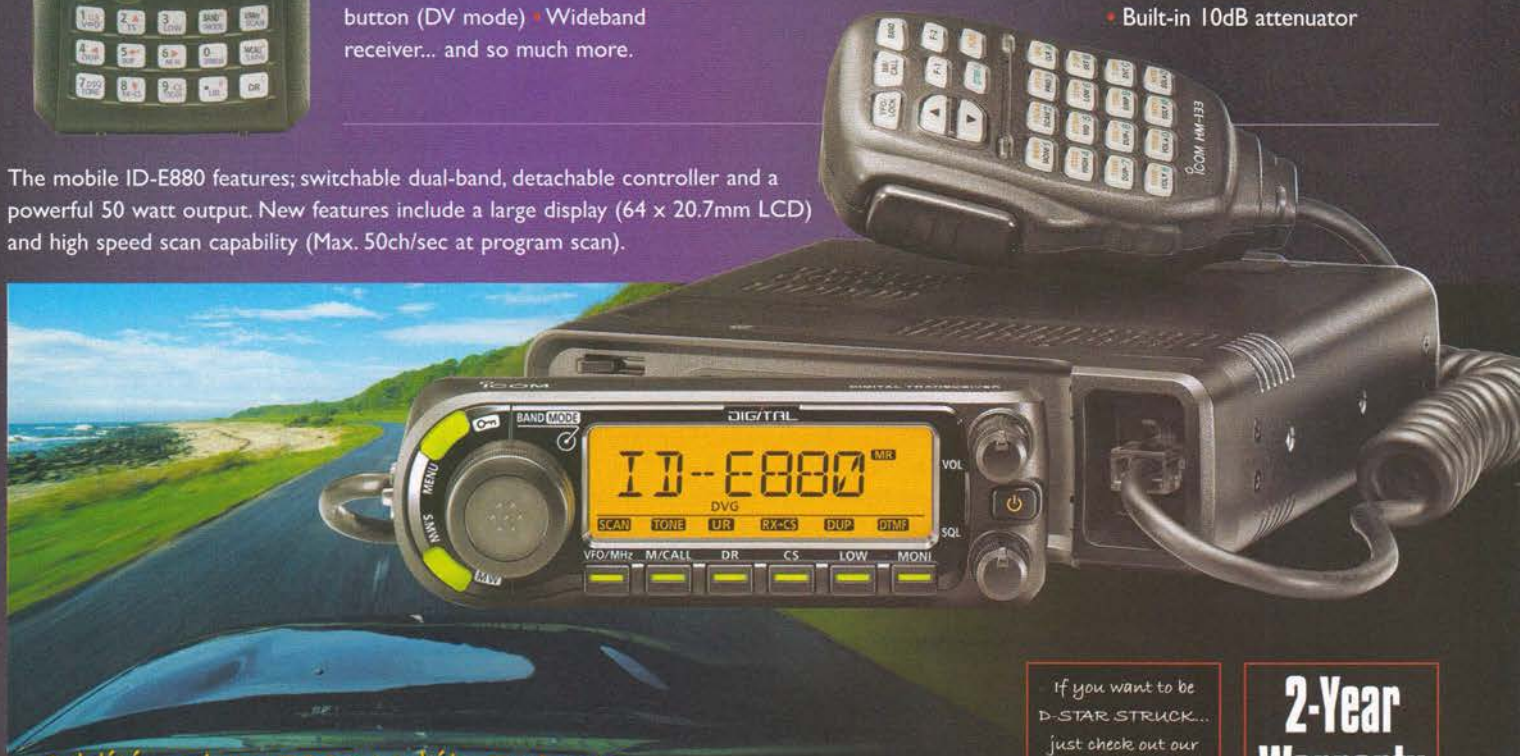
• D-STAR DV-mode operation (Digital voice + slow data) • DR (D-STAR repeater) mode for easy setting • Free download cloning software CS-80/880 (Download from ICOM website: www.icom.co.jp) • GPS position reporting functions (DV mode) • GPS A mode for easy D-PRS operation • One-touch reply button (DV mode) • Wideband receiver... and so much more.

The handheld IC-E80D provides GPS position reporting functions in DV mode when used with the optional HM-189GPS. A Li-Ion battery pack provides a high 5 watt power output in both VHF/UHF bands and gives up to 6 hours operating time (approx.)

Additional IC-E80D Handheld Features...

• Free remote-control software option • External DC 10~16V.DC power jack, allows operation while charging • 4-step RF power selection • Auto power-save and power-off • Built-in 10dB attenuator

The mobile ID-E880 features; switchable dual-band, detachable controller and a powerful 50 watt output. New features include a large display (64 x 20.7mm LCD) and high speed scan capability (Max. 50ch/sec at program scan).



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DIGITAL

Homebrew

Following the last few months of relatively advanced projects, this month we get back to basics and build some very simple receivers

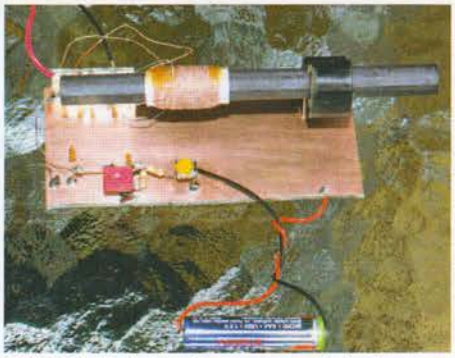


PHOTO 1: Prototype long wave crystal set.

EARLY DAYS. The first radio receivers were very simple devices. The receiver used by Heinrich Hertz for his pioneering experiments in the 1880s was nothing more than a metal loop with a small spark gap. When the receive loop was placed near a spark transmitter, reception of radio signals was indicated by a tiny spark across the gap at the open ends of the receive loop. Such a simple system would have a very limited range. A web search for photographs of Hertz's equipment turned up many images of relatively small and beautifully built structures made from brass and polished wood. It seems very unlikely that these lovely ornaments could ever have sent and received radio waves, even over a short distance of only a few metres. My search eventually led me to a Google Books listing for *Heinrich Hertz: Classical Physicist, Modern Philosopher* [1]. This book includes photographs of the original equipment and a detailed list of the components used. The Hertz transmitter was less elegant and much larger than the highly polished replicas. DC power was provided by a battery of more than 1000 cells. The two receiving aerials were square loops mounted on insulators. The size of the loops was approximately one wavelength at the transmit frequency of around 50MHz. It would appear that Hertz may also have been the inventor of the quad loop and the two element quad.

A receiver using a spark gap as the detector will not be very effective as a communications device. If the range is to be extended beyond a few metres, a more sensitive detector will be required. Several different types of detector were developed in the years following Hertz's experiments. The most successful of these was the crystal detector. This was the first semiconductor diode device used in radio communication. Early crystal detectors were of the 'cat's whisker' type. The detector diode was a semiconductor junction formed by a thin pointed wire in contact with a galena crystal. A point-contact germanium diode like the IN34A or OA91 is basically a miniature cat's whisker sealed in a glass tube. The Indian physicist Jagadish Chandra Bose used crystal detectors for radio signalling and remote control in the late 19th century. Chandra Bose used frequencies around 60GHz for some of his experiments. He was so far ahead of his time that it took a further fifty years and a radio technology boom driven by two world wars before the use of millimetre wavelengths became commonplace.

The circuit in **Figure 1** is just about the simplest possible configuration for a radio receiver. The balanced aerial is connected directly to a diode detector. For best sensitivity, the diode should have a low forward voltage drop. Germanium point contact diodes and small Schottky diodes are widely used as RF detectors, demodulators and mixers. The voltage developed across the diode is fed directly to a pair of high impedance headphones. Although this is a very crude receiver with little or no selectivity, it would be substantially more sensitive than the spark-gap receiver used by Hertz. If the headphones are replaced by a DC microammeter, the circuit could be used as an RF field strength indicator. Receivers of this type have been sold as microwave oven RF leakage detectors.

In the late 19th century, the simple circuit in Figure 1 would have been a state-of-the-art receiver. The lack of selectivity wouldn't have been such a big problem at a time when the RF spectrum was almost free of man made noise. As spark-gap transmitters generate signals with a very wide bandwidth, there would be little point in using a receiver with a very narrow bandwidth. Once radio became more widely used, selectivity (the ability to receive a single station while ignoring all others) became much more important. The arrival of the first broadcast stations just after World War I placed new demands on receiver performance. By this time, transmitting stations were generating carrier wave signals using valve (vacuum tube) oscillators. This new technology generated much cleaner and narrower signals than the old rotary spark gap transmitters.

THE CRYSTAL SET. A crystal detector is one of the key components in a very simple amplitude modulation (AM) receiver. This type of receiver is known as a crystal set. In most cases, the crystal set doesn't need a battery or DC power supply. All of the energy required to drive the diode detector and the headphones (or single earphone) comes from the received radio signal. This means the crystal set can be used in locations where mains power is not available. As there is no battery to go flat, the receiver will keep running forever, or at least until the broadcast station stops transmitting.

Figure 2 shows a simple crystal set. The receiver consists of an aerial and ground system, an LC tuned circuit (which gives greater selectivity than the previous design), a diode detector/demodulator and a pair of high impedance headphones. Good reception is only possible if the signal is strong. The aerial should be as long and as high as possible. In a typical crystal set installation, the aerial wire would be 30m (100ft) or longer. In the case of an end-fed wire aerial, the ground connection becomes an important part of the aerial system. A copper water pipe can make a good earth connection for a crystal set. A central heating radiator can be a convenient connection point for the earth wire. Obviously, this will only work well with metal plumbing. In most installations, water and central heating pipes are bonded to earth. This makes an ideal earth system for medium and long wave crystal sets.

The LC resonant circuit usually provides sufficient selectivity to tune a single station on the medium or long wave band. For best results the LC circuit Q should be as high as possible. Many crystal set builders go to great lengths to achieve the highest possible Q by using high quality air-spaced tuning capacitors and large coils. Coils for LF and MF are often wound from multi-stranded Litz wire. Special winding methods may be used to keep inter-winding capacitance to a minimum. Basket-weave coils are wound with adjacent turns on opposite sides of a spindle in the same manner as a wicker basket. Spiderweb coils have a similar appearance to the web of an orb-weaver spider. I have never done any measurement to see if this style of construction really does lead to improved resonant circuit Q. Perhaps this would be an interesting subject to explore in the future.

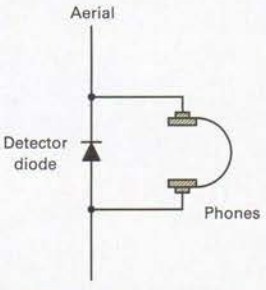


FIGURE 1: The simplest receiver – a diode detector.

The detector diode should be

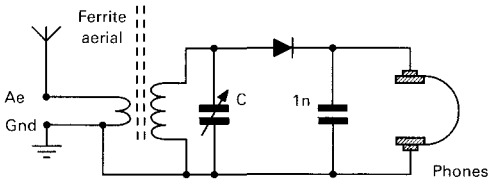


FIGURE 2: A simple crystal set.

a germanium point-contact type or a small Schottky signal diode like the 1N5711 or BAT43 (Maplin VR19V). These diodes have a lower forward voltage drop than standard silicon switching diodes like the 1N4148. I tested a few signal diodes using the diode test function of my digital multimeter. This test measures forward voltage drop at a constant current of 1mA. The measured voltages were as follows. BAT43: 277mV, IN5711: 353mV (both Schottky), OA91 (germanium point-contact): 379mV, 1N4148: 602mV. This shows a substantial difference of almost 7dB between the best and worst cases. When all of the signal comes from a distant transmitter, every mV counts.

I built a crystal set based on the schematic in Figure 2. I did encounter a few problems in the process. The biggest problem by far is the fact that all of the Irish medium wave transmitters were closed down in 2008. I live within a few hundred metres of the Cork medium wave mast. When it was transmitting, I could get good reception using just a ferrite rod aerial. With a 30m wire and a good earth connection, there was enough signal power available to drive a loudspeaker. There are currently no strong medium wave signals available during daylight hours. It may be possible to pick up DX signals after dark, but this would be quite difficult with such a simple receiver. There are a few reasonably strong stations on the long wave band. RTE transmits Radio 1 on 252kHz from Co Meath. BBC Radio 4 from Droitwich on 198kHz is another possible signal source.

I used a ferrite rod aerial as the tuned circuit inductor. As I was mostly interested in the LW band, I needed a dual-band type with separate coils for LW and MW. The Maplin LB12N seemed like an ideal choice. The LW coil inductance is specified as 3.2mH. By adjusting the coil position on the rod, I found it was easy to adjust the inductance from less than 3mH to almost 5mH at the centre of the rod. For someone who is accustomed to measuring inductance in nH, this is a very large value for an RF inductor. Assuming a coil inductance of 4mH, $2*\pi*f*L$ gives an inductive reactance of 6333Ω at 252kHz. To form a resonant circuit, a capacitor with a value of $1/(2*\pi*f*XC)$ is required, where XC=XL=6333Ω. The revised formula $1000000/(2*\pi*f*XC)$ gives the capacitance value in pF where f is frequency in MHz and XC is capacitive reactance in ohms. The required capacitance values are 99.7pF for 252kHz and 126.9pF for 198kHz. The actual value required will be less because the calculation does not take aerial or detector capacitance into account. A standard 365pF tuning capacitor should have enough range to cover the entire LW band. A smaller maximum value in the range 150-250pF will still cover the range I am interested in. I used a small 'polyvaricon' style capacitor for some of my tests and a fixed 100pF ceramic disc capacitor for some of the tests on 252kHz.

High impedance headphones are quite rare these days. Cheap high impedance crystal earphones are readily available on eBay. Alternatively, you can use ordinary low impedance phones with a suitable matching transformer. The transformer from the audio output stage of an old valve radio or TV is ideal for this purpose. Miniature audio transformers like the LT700 (Maplin LB14Q) should also give good results.

A small mains transformer may give acceptable results at audio frequencies. I used a 220V to 22V transformer. The 220V primary was connected to the crystal set detector output. A pair of lightweight headphones were connected to the 22V secondary. At risk of stating the obvious, no part of a crystal set should ever be connected to mains electricity.

As a last resort, you can use the line input to your computer sound card as an audio amplifier or you can use a dedicated audio amplifier (Homebrew #1, January 2006). As this option requires a power supply, it removes the main advantage of the crystal set.

Testing the crystal set during daylight hours using headphones, 30m+ of wire and a good earth system consisting of several buried earth rods connected in parallel showed no trace of any signals. At night the signal from RTE 1 on 252kHz was weak but just about readable. Using the line input of the PC as an amplifier resulted in good readable signals during daylight and at night. I even had some interference from a French language station (possibly from Algeria).

Adding a small amount of forward bias to the detector diode gives a significant improvement in receiver sensitivity. **Figure 3** shows the modified crystal set. Diode bias comes from a 1.5V AAA alkaline cell. This doesn't provide any amplification and, as battery current is only a few μA, there is no need for a power switch. This configuration gives good reception by night. Signals are now detectable but still very weak during daylight. **Photo 1** shows the assembled crystal set.

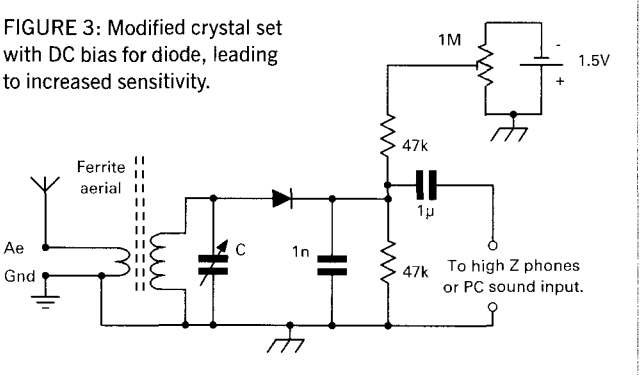
Ferrite rod aerial datasheets are a notoriously unreliable source of information. These are very low cost components designed for use in cheap AM broadcast receivers. Exact dimensions and wire colour codes are likely to change without notice. The colour coding for the LW coils of my Maplin ferrite rod aerial are: Main coil ~4mH = uncoloured/black coupling coil: ~300μH = red/blue. If in doubt, a resistance meter will show that the main coil has a much higher resistance than the coupling coil. My measured values were main: 10.3Ω, coupling: 1.1Ω. The coupling coil is used for the aerial and earth connections. This acts as a step-up transformer, giving a useful increase in voltage at the detector and better selectivity due to reduced loading of the LC resonant circuit by the aerial.

TRF AND REGENERATIVE RECEIVERS.

The introduction of the valve (vacuum tube) in the first couple of decades of the 20th century resulted in a dramatic improvement in receiver sensitivity. The early valve amplifiers had significant gain at LF and MF. Gain was reduced at shorter wavelengths, but significant gain could still be achieved by cascading several amplifier stages. Edwin Armstrong's superhet receiver **[2]** allowed excellent sensitivity and selectivity at all frequencies, but we will leave the subject of more advanced receivers for a future discussion. TRF receivers used a tuned amplifier or, in more complex circuits, several tuned amplifiers in cascade. Each amplifier was tuned to the signal frequency. This provided high gain, good sensitivity and also had the potential for high selectivity. This worked well for a single frequency receiver. It was quite difficult to achieve accurate tracking of several tuned stages in a tuneable receiver. It was also difficult to achieve high gain over multiple amplifiers all tuned to the same frequency without suffering from instability (unwanted oscillation).

One of the most popular TRF receivers for broadcast and amateur reception is a simple single-stage regenerative detector. This can be used directly with headphones or with a separate audio amplifier stage. These receivers can provide remarkably good sensitivity. Selectivity is much better than a crystal set, but still not as good as a superhet. Regenerative receivers use carefully controlled amounts of positive feedback to increase gain and improve selectivity. A tuned amplifier with positive feedback and gain greater than 1 meets all

FIGURE 3: Modified crystal set with DC bias for diode, leading to increased sensitivity.



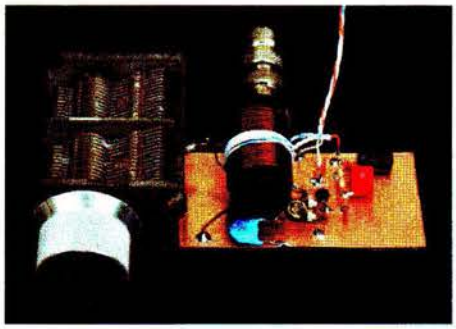


PHOTO 2: Prototype TRF regenerative receiver.

of the required conditions for oscillation. For reception of AM signals, the regeneration control is set just a little below the point where the circuit starts to oscillate. The positive feedback tends to reinforce the input signal, which leads to an increase in gain. Positive feedback also compensates for losses in the LC tuned circuit so that circuit Q is greatly increased. This leads to improved selectivity. The classic regenerative TRF circuit uses a single RF amplifier where the active device is a valve (tube) FET or transistor. The inductor in the LC resonant circuit has a separate 'regen' winding, which is used to feed some of the output signal back to the amplifier input. I used a dual-gate FET in my regenerative receiver. The design is based a circuit I built in the latter part of the last century [3]. The schematic of the TRF receiver is shown in **Figure 4**. The dual-gate MOSFET offers greater gain than a single JFET. Adjusting the bias on gate-2 of the MOSFET allows fine control of amplifier gain. This is much easier to adjust than the main regeneration control. If a suitable MOSFET is not available, it should be possible to use a pair of JFETS in a 'cascode' configuration in place of the dual-gate device. The previous version of this circuit used a 3SK45 MOSFET. The current version uses a BF981. As the circuit provides easy adjustment of the DC bias conditions, just about any N-channel dual-gate MOSFET like the BF961, 40673, 3N201, 3SK88 or surface-mount equivalents like the BF998 and BF966S should work well in this circuit. I used a 9V battery as the DC power supply. Any DC supply in the 8-12V range should work equally well. Dual-gate GaAsFETS should not be used in this circuit unless the power supply voltage is reduced to a safe level.

As the FET is a UHF device, the receiver can be used over a wide range of frequencies. In practice, it works best in the lower half of the short wave range from LF up to 10-15MHz. Frequency stability will be very poor on the higher bands, particularly for SSB and CW reception. As with the crystal set, the TRF receiver can be used with high impedance phones, PC sound input or an external audio amplifier. The circuit is very easy to build and test. Frequency calibration is difficult at the best of times and even more difficult if you don't have an oscilloscope or frequency counter with a sensitive input. Part of the fun of using such a simple receiver is the element of uncertainty. The best approach is to tune slowly until you find some SSB or Morse code. Once you find some Morse, there is a good chance you have found an amateur band, although you won't necessarily know which band it is. When you find something of interest, take note of the capacitor position or make a mark on the tuning dial.

CONSTRUCTION. The circuit was built dead bug style on a strip of PCB laminate. You should try to have the FET and particularly the LC resonant circuit components rigidly fixed in position. Component placement is not at all critical. We don't have to worry too much about circuit stability. For reception of SSB and CW, it is an absolute requirement that the amplifier is not stable – ie: it becomes an oscillator. The amplifier/oscillator/detector is a series-tuned Clapp/Gouriet type. Positive feedback is from the FET source to gate-1 using a capacitive divider. This removes the the requirement for a separate regeneration coil wound over L2. A 1k linear pot is used for coarse adjustment of regeneration. Fine control is achieved by varying gate-2 bias using a 10k pot. The circuit should be mounted close to the front panel so that the wires for the coarse regen circuit can be kept short.

L2 in my prototype is 25 turns of 1mm enamelled copper wound on a short length of 20mm PVC conduit. L1 is 5 turns of insulated wire wound over L1. As usual, I used insulated wire stripped from telephone cable for this purpose. The measured inductance of L2 is 7.9μH. This is a reactance of around 185Ω at the Homebrew Net frequency of 3.727MHz. A capacitor value of around 230pF is required for 80m coverage. I used a 250pF variable capacitor in parallel with a 100pF fixed capacitor. Unlike the crystal set described earlier, this receiver is capable of narrow-band reception of SSB and CW signals. High quality polystyrene or mica types are recommended for the fixed capacitors. A double bearing air-spaced capacitor is preferable to the cheap and nasty Polyvaricon type for the main tuning capacitor.

This receiver is extremely easy to build. Component values are not at all critical. There is plenty of room for experimentation. I was able to extend the coverage down to 160m by partially inserting a ferrite core into L2. Considering the simplicity of the design, frequency stability was quite good on 160m, reasonable on 80m and poor on 5MHz and above. When monitoring the Russian RWM frequency standard on 4.996MHz, I noticed a pronounced chirp on the continuous carrier signal. This was not due to a steady frequency drift in one direction. The problem was caused by movement of the aerial due to the gale force winds of a typical Irish summer day.

Tuning the receiver is very different to tuning a synthesised black box receiver. Regeneration adjustment is quite tricky and the amount of feedback required varies depending on the frequency you are tuned to. Frequency tuning is also quite difficult, although this can be improved if you use a well screened enclosure and a reduction drive for the capacitor. Another option is to use a second tuning capacitor in parallel with the main tuning capacitor. This capacitor should have a much smaller value than the main capacitor. This 'bandspread' capacitor can be used for fine tuning of SSB and CW signals. As an alternative to using a second variable capacitor, you could use a varicap diode as the bandspread capacitor. When receiving SSB and CW, the simple regenerative Rx has the same limitations as a simple direct conversion receiver. It is a double sideband receiver so it will respond equally well to signals above or below the oscillation frequency. Another potential problem with a simple regenerative receiver is oscillator leakage. As there is no RF amplifier stage to provide a buffer between the oscillator (regenerative detector) and the aerial, some of the oscillator signal may be radiated by the aerial. As the leakage is a small fraction of a mW, this is unlikely to cause problems. The higher voltages in valve receivers could easily cause interference to a close neighbour who happened to be listening on the same frequency.

Next month: Some more advanced receivers.

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[1] *Heinrich Hertz: Classical Physicist, Modern Philosopher.* D Baird, R I Hughes, A Nordmann. Kluwer Academic Publishers, 1998.
[2] http://en.wikipedia.org/wiki/Edwin_Armstrong
[3] http://homepage.eircom.net/~ei9gq/regen.html

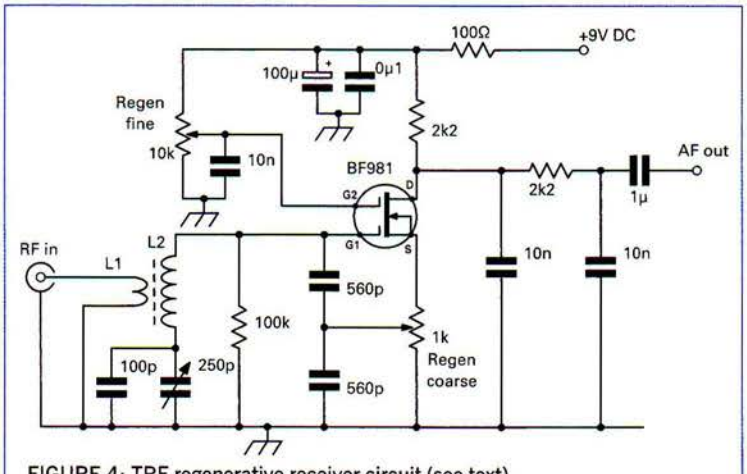

FIGURE 4: TRF regenerative receiver circuit (see text).

Antennas

The Controlled Feeder Radiation Dipole and the G3ENI/G3ZUN 5MHz NVIS variation

PHOTO 1: A vertical Controlled Feeder Radiation dipole for 14MHz, constructed by taping multi strand insulated copper wire and RG58 coax to a fibreglass support. The coax coil current choke can be seen in the foreground.

THE G3ENI/G3ZUN REQUIREMENT.

There are many locations where an end-fed antenna can be more convenient than a centre or off-centre fed system. However, feeding an end-fed wire against an earth system can lead to high RF voltages or currents in the shack.

John Pegler, G3ENI and Dan Sharpe, G3ZUN required a portable antenna for their 5MHz NVIS experiments. A search through literature indicated that 'controlled feeder radiation' would prevent the RF in the shack problem while at the same time allowing the convenience of an end-fed structure. G2HCG described methods of feeding antennas using this technique in [1].

Figure 1 shows the version selected by G3ENI and G3ZUN

The authors noted, "This flexible design enabled the antenna to be placed in a variety of ways. For example, lying on the ground, hung from an upstairs window, on top of a hedge or the far end up a tree. At G3ENI it was sited on a hedge for the majority of its length at an average height of 3 metres. At G3ZUN the feeder dropped down from an upstairs window and then ran along a hedge at similar height to G3ENI's, rising to about 4 metres at the far end up a tree. The standing wave ratio was found to be well below the 2:1 figure for all 5MHz frequencies.

"The join between the wire and coaxial centre was by means of an eye-bolt to cope with the strain. It was protected from the weather with self-amalgamating tape".

The type of 50Ω coax used on this antenna was not specified but if the antenna is to be portable or light weight then RG-58 or Super 8 would be the most practical. The material used in the top quarter wave section was also unspecified but as it may need to be laid across hedges or trees then a flexible, insulated conductor is called for.

HOW DOES IT WORK? If we consider the simple dipole fed with coax, the coax is connected to the wire elements as shown in **Figure 2**. The two opposing currents, I1 and I2, in the coax feeder are equal but because of the physical differences between the two conductors of the coax feeder it is unlikely that I1 and I2 will be the same in the two conductors of the dipole. The difference between I1 and I2 flows down the outside of the coax as I3 and is known as common mode current.

This current causes the coax to be part of the radiation and reception characteristic of the antenna instead of sticking to its design role as transmission line. This uncontrolled characteristic can cause TVI/BCI on transmit and an increase in noise on receive. It also can cause directional pattern distortion if it occurs on the feeder of a beam antenna. Generally, common mode currents are regarded as undesirable and literature abounds with solutions to minimising them.

However, common mode currents can be put to use – the secret is control. Consider the antenna shown in **Figure 3**. It is a vertical quarter wave antenna with no radials. In this case all the current on the inside of the coax braid will flow down the outside of the braid because it has nowhere else to go. If a high impedance choke is placed a quarter wavelength down from the feed point, the coax outer braid will function as the counterpoise to the vertical element.

This then is the Controlled Feeder Radiation antenna. Its main advantage is mechanical simplicity and there is no requirement for a separate antenna tuner. The antenna can be easily stored and unwound from a cord reel without a tangle of cable and wire so it is fine for portable use. The downside is that it is a single band antenna and that special attention needs to be paid to the design of the choke.

THE G3LDO VERSION. By chance the arrival of the material on the Controlled Feeder Radiation antenna from G3ENI/G3ZUN coincided with a particular requirement of my own. I give a demonstration of an operational vintage (circa 1939) radio station [2, 3] at the local East Preston Carnival and I needed a 14MHz antenna. The space available for this antenna measured 1m x 4m and so a vertical was the only option. Last year a vertical

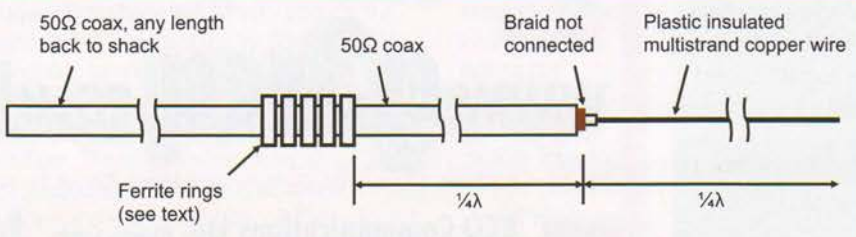

FIGURE 1: The G3ENI/G3ZUN antenna based on the design by G2HCG.

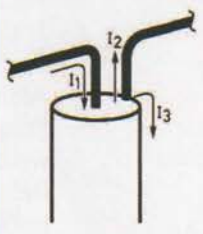

FIGURE 2: Coax cable connected to a dipole antenna showing the I1, I2 and I3 currents.

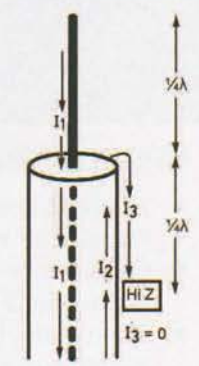

FIGURE 3: The Controlled Feeder Radiation dipole. It can be deployed vertically as shown or horizontally, such as from an upstairs bedroom window.

PHOTO 2: A coax current choke constructed from of 9 turns of RG super 8 coax wound on a 4.25in (110mm) plastic pipe.

wire was fed against a suspect earth using an ATU but was not very successful.

In the meantime I had also read an article by W2OZH [4] (described in Technical Topics [5]). His antenna for 80m uses a coaxial choke balun comprising 13 turns of cable coil on a cord reel (13 turns, 6 inch diameter) as shown. **Figure 4** shows the construction, schematically, for a frequency of about 3.95MHz (in the American 3.5MHz band). Other frequencies can be simply computed from the equation for simple dipole antennas.

I constructed my version of the antenna by taping 16.5ft of 16SWG multi strand insulated copper wire to a fibreglass support. The bottom end of this wire was connected to the centre conductor of a 17ft length of RG57. Initially, a Ferromagnetics ferrite balun (as shown in Figure 1) was used, but this proved to be unsatisfactory. I then considered a coax coil current choke proposed by W2OZH and this worked very well, with transatlantic QSOs achieved in the middle

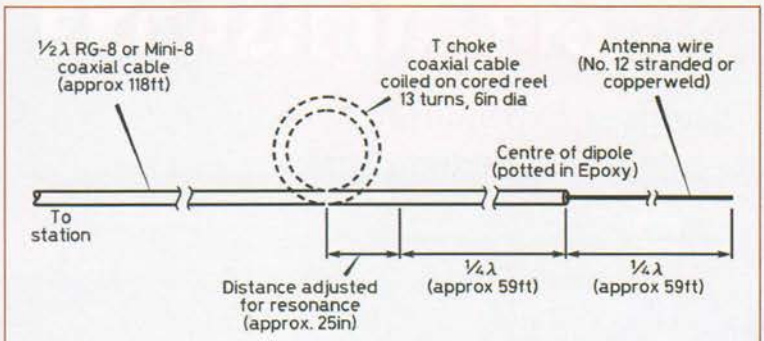

FIGURE 4: W2OZH's CFR dipole for a frequency around 3.95MHz (American 3.5MHz band) using a coaxial choke balun.

of the day in poor conditions. The final arrangement of the complete antenna is shown in **Photo 1**.

COAX CURRENT CHOKE. I made some measurements of the resonances and impedances of various coils of coax wound on a 4.25in (11mm) plastic pipe. I finished up with of 9 turns of RG super 8, as shown in **Photo 2**. The choke exhibited a very high impedance of over 12kΩ at resonance when measured using the AIM-4170, as shown in **Figure 5**.

You can appreciate that the resonant frequency of this choke arrangement is very much dependent on the value of any parallel capacitance. The AIM-4170 appears to have a loading capacitance of 10pF. The resonance characteristics shown in Figure 5 occurred with 15pF of capacitance; 10pF from the AIM-4170 and an extra 5pF from a homemade twisted wire arrangement.

This begged the question: what would the resonance of the choke be when inserted into an antenna system with an indeterminate choke loading capacitance? One method tried was by measuring the choke resonance using a dip oscillator. The resonant frequency of the choke (with 15pF) while not connected to the antenna was the same as that measured with the AIM-4170.

When the choke was connected to the antenna shown in Photo 1 it was not possible see a resonance dip.

It seems that the antenna loads the choke and it is probable that in practice its impedance is less than the 12kΩ shown in Figure 5. Nevertheless the SWR characteristic of the antenna as a whole was very good, as shown in **Figure 6**.

You often see choke baluns wound without a plastic coil former by scramble winding the coax into a coil and taping it together. This could result in the first and last turns touching each other and cause the distributed capacitance of the choke to be increased. Additionally, the RF-lossy vinyl jacket of the coax may be subjected to a high RF voltage. A single layer winding on a former ensures the RF voltage gradient across the coil is even – and it is easier to predict the resonance.

FERRITE RING CHOKE. A ferrite ring choke is advocated by G3ENI and G3ZUN, see Figure 1. They note, "The cylindrical or clip-on ferrite rings should have a reasonably high μ and could be Type 43 or 77 material. A length of about 10cm was used".

I tried a W2AU type choke but this didn't work, probably because its impedance is only around 500 – 600Ω. I know that ferrite current choke will work provided it has a high enough impedance. I will return to this subject in a later column.

REFERENCES

[1] 'Controlled Feeder Radiation', G2HCG, *RadCom*, May 1990
[2] G3LDO QRZ.com for photo of vintage rig.
[3] www.g3ldo.co.uk
[4] 'Resonant Feed-Line Dipoles' (*QST*, August 1991, pp24-27)
[5] TT *RadCom*, June 1997 (also *Technical Topics 1995-1999*)

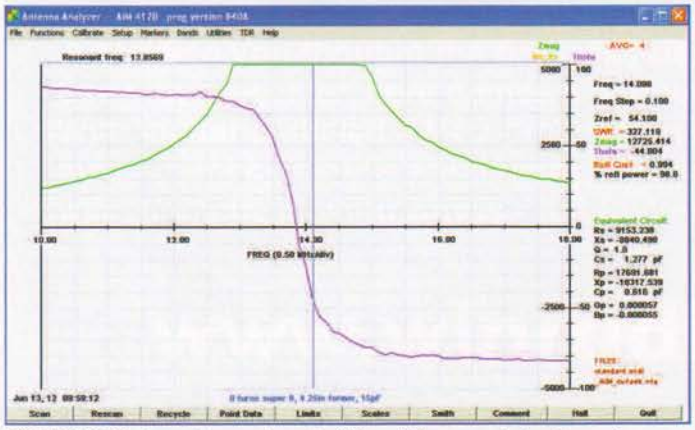

FIGURE 5: The impedance characteristics of the coax choke shown in Photo 2, measured using the AIM-4170.

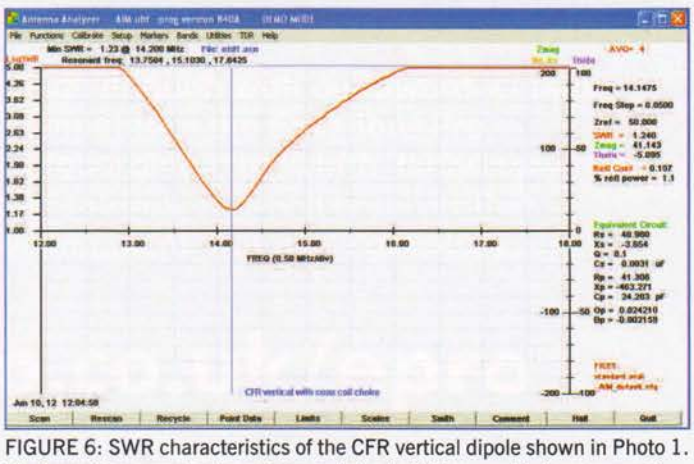

FIGURE 6: SWR characteristics of the CFR vertical dipole shown in Photo 1. The impedance graphs have been switched off: they wouldn't mean much because the connecting cable was not calibrated.

Unaudited Income & Expenditure Account for the six months ended 30 June 2012

	30-Jun-12	30-Jun-12	30-Jun-11	30-Jun-11
Income				
Subscriptions	427,009		425,757	
RadCom Advertising	77,379	504,388	82,179	507,936
Books and Products for Resale		158,778		145,492
Sponsorship		2,083		3,583
Other Services - inc Examination Services		74,090		55,649
Total Income		739,339		712,660
Contribution from Subscriptions, *RadCom*, Publication and Services				
Subscriptions net of *RadCom* Publication Costs	328,407		324,918	
Amateur Radio Costs, net of Income, Sponsorship & Exams				
GB4FUN, net of Sponsorship		281,039		265,642
Books and Products for Resale		51,657		46,026
Other Services net of expenses		6,650		7,024
Total Contribution from Activities		339,346		318,692
Less Non Activity Specific Overheads				
Commercial Costs				
Bletchley Park				
Administration				
Personnel Costs				
Office Costs				
Landlord Costs				
Net Surplus/(Deficit) from Activities		61,874		
Interest Income		6,329		4,913
Disposal of Fixed Assets		10,667		
Spectrum Defence Fund donations		194		144
Legacies		1,140		
Net Surplus (Deficit)		80,204		

At the 30 June 2012 the net surplus was £80,204 compared to a net deficit of £19,658 in 2011.

This is a particularly pleasing result considering this period includes the opening of the National Radio Centre, in conjunction with the Bletchley Park Trust.

Income includes £10,667 from the disposal of fixed assets and a further £990 of Legacy Income. Subscriptions are broadly in line with 2011. Overall, costs are £71,774 lower than the six months to June 2011 of which £37,721 is attributable to reduced Legal fees. The first half year performance has been enhanced by a number of factors, including the deferral of expenditure and an unpaid Acting General manager for much of the time. The second half of the year is traditionally a very active period for the Society with higher expenditures. This, combined with the full costs of a General Manager and some areas of expense deferred from the first half, will mean that the year-end outcome will be closer to break-even. The net result will depend upon decisions regarding the use of the Legacy Funds of £166,000.

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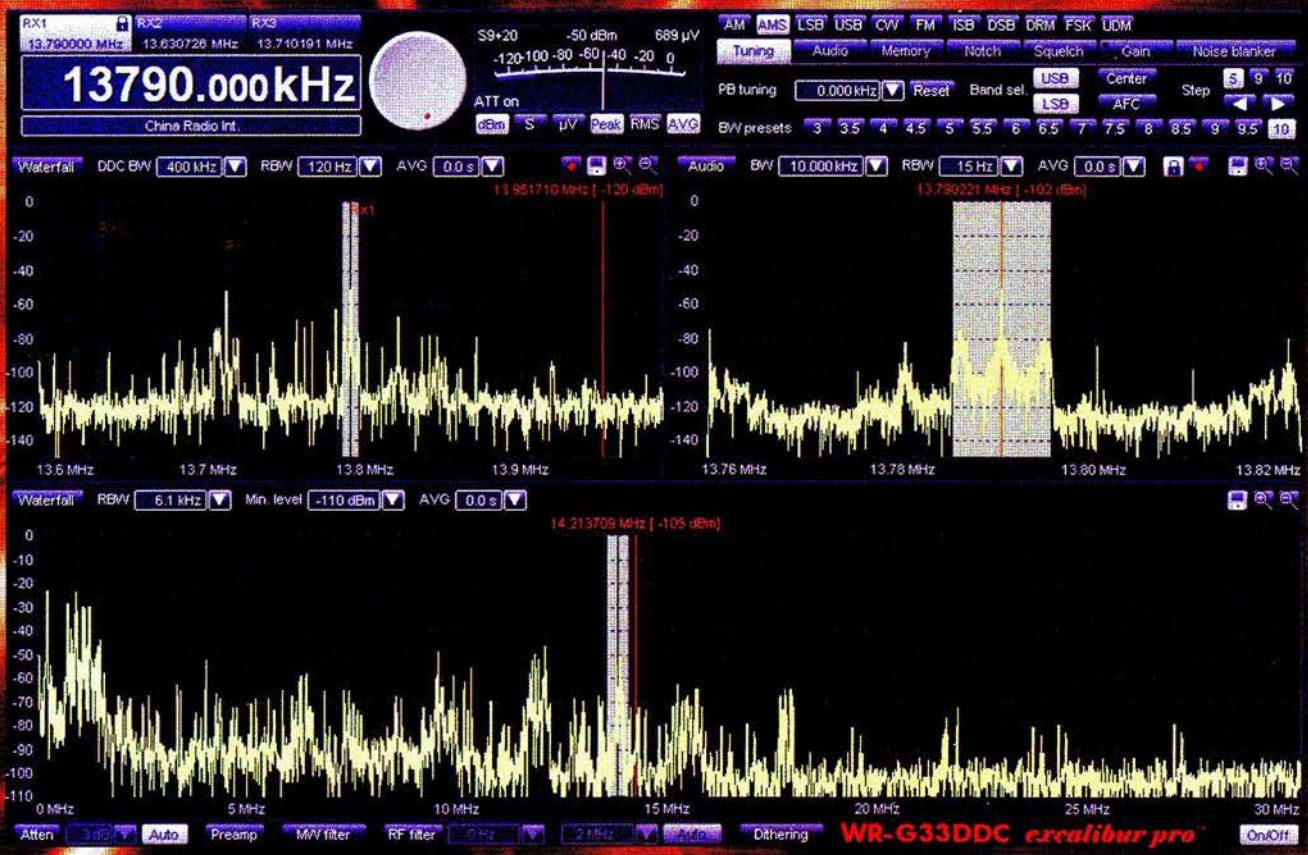

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British Inland Waterways on the Air 2011 & 2012

Reports from around the country

GB2TWF operated by Burton ARC at Shobnall Fields for The Waterways Festival 2011.

BIWOTA. The last weekend in July 2011 proved a busy one for amateur radio waterways enthusiasts. Forty-four special event stations were set up on or adjacent to Britain's canal rivers and lochs ranging from the River Ouse in the south to the Caledonian Canal in the north. We also had three of the main waterways museums activated – Goole Waterways museum, Ellesmere Port Waterways museum, GB0NWM and Foxton Inclined Plane museum, GB2FIP. The event was organised to coincide with the Waterways Festival held from Friday 29 to Sunday 31 July 2011 at Shobnall Fields, Burton-upon-Trent, where GB2TWF was set up on the festival site. Operating inter-G was difficult as the IOTA contest was running and HF propagation during daytime was poor for short distances. However, participants operating from their boats in the evening made many good contacts when HF conditions improved after dusk. Many good contacts were also made on V/UHF. Here's how a few of the many participants got on.

BURTON ON TRENT ARC. Led by Michael White, G4HZG Burton on Trent ARC set up GB2TWF at the National Festival site at Shobnall Fields. They were joined by thirteen other operators attending the festival to man the station. It was the highest attraction at the site thanks to the RAYNET mast and attracted many of the 15,000 festival visitors to the tent to see amateur radio in operation and find out more about the hobby. Over the weekend hundreds of visitors stopped by the stand including nearly sixty amateurs and SWLs. Great interest was shown between the amateurs on what worked best by way of installation, particularly regarding antennas and siting. Visits to narrowboats *Carnival, Egerton* and *Oakmere* to see the installations were also popular. In total over 400 contacts were made, which was pleasing considering many were long ragchews between people interested in operating waterways mobile. A great weekend was had by all, including sampling the entertainment and real ale tent at the festival.

CAITHNESS AMATEUR RADIO SOCIETY. Feeling they should operate actually on the water, Caithness Amateur Radio Society used a 38ft ketch, *Good Grace*, berthed in Inverness, 116 miles from our club base in Castletown.

The preceding Thursday saw Hamish Duncan, MM0HDW in Inverness at the top of the mast fitting an eye plate to take a boom so the antenna could be well out from the rigging. Next the yacht had to go through the locks into Loch Ness and onward to Fort Augustus. This took all of Friday and included setting up the shore tent up for the public visits over the weekend.

Jim Durand, GM4XLN and Les Thomas, GM0TKB arrived and got the antenna up with poles projecting from bow and stern to give height to the antenna ends. They had made up a tri-band dipole from wire and plastic spacers; this worked really well and it had been tuned the week before on an antenna tuner to save some time.

They had immediate success with stations queuing up to work them – 17 countries, must have been the magic words Loch Ness that did the trick. They even worked Brazil. The operators all said they had a great weekend with a lot of interest by public from passing yachts (and several bottles of top malt). On the Monday they packed everything away and proceeded to cruise down the Caledonian Canal to Fort William with more contacts made in transit using a hustler antenna. By the time *Good Grace* was back to the winter berth in Inverness she had sailed all the 28 miles of Loch Ness and cruised the west coast, Oban, Mull area (it's very rare for this to happen under sail).

GB2SRO (SUSSEX RIVER OUSE). Celebrating the right of navigation, which still exists on the Sussex river Ouse, GB2SRO was operated by Gavin Keegan, G6DGK, Kevin Murphy, G4XBG and Phil Brown, M5BTB from Isfield Lock. The Sussex Ouse Restoration Trust (SORT) has been

Jim Lee, G4AEH operating GB2TWF with Peter Best G8CQH recording another visitor's details.

established for some years with the aim of restoring the navigation to all parts of the upper (non tidal) Ouse and have been working to restore the lock at Isfield for some time.

Shortly before the end of July, Roger, G7VBR, Phil, M5BTB and Gavin, G6GDK visited the lock and, with Roger's catapult and bow and arrow expertise, they erected a doublet aerial in a roughly east west orientation, hoping for good propagation to the north/south. Over the weekend they operated mainly on 80m and 40m to achieve a QSO count about 60 and included various UK and European countries and one to Israel – Gabriel, 4X4KU – which was very encouraging.

BiWota organiser John, M0JAV contacting VK5 on a rotatable dipole early morning aboard narrowboat Carnival at the Waterways Festival

Installation on ketch *Good Grace* that operated from Loch Ness by Hamish Duncan, MM0HDW.

2012 EVENT. This year's event was held on 25-27 August to coincide with the Preston Guild Canal Festival in Haslem Park. The Central Lancs ARC will be setting up a special event station at the festival site. If you are planning to set up a station for the event this year please let John Rogers, M0JAV know at drm133@rsgb.org.uk (or call 07836 731 544) or register your details with the forum for BiWota 2012 at forum.BiWota.org.

Listen out for BiWota stations on the August bank holiday weekend or go portable on a towpath or riverbank.

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National Hamfest

Notts & Newark Showground, 28 & 29 September

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SIX WEEKS TO GO. You can't accuse the National Hamfest of being the same every year. The event is growing year on year and, as a result, the amateur radio manufacturers and dealers are bringing all the latest equipment to the show.

Yaesu will be bringing samples of the new FT-1D digital and FM handheld and the much awaited FT-DX3000 HF/50MHz 100W transceiver. The radios were well received in Dayton earlier this year. These rigs will not be on sale until next year and this will be the first time they have been seen in the UK. Of course, the rest of their amateur radio line-up will also be on show.

Kenwood will have all their current range including the top-selling TS-590S mid-size HF/6m transceiver. They expect to be showing a pre-production sample of the new TS-990S flagship base station rig. This has not been seen in the UK and there are high expectations of it. From early pictures, it looks like a knob twiddler and button pusher's paradise!

Icom have demonstrations of their new RS-BA1 remote control software that allows a user to control selected Icom HF amateur radio transceivers through an IP network. The product has just been launched. Imagine being able to sit in your favourite armchair while controlling your rigs in the shack. Taking things a step further, imagine operating a remote station via the internet.

The main dealers will also be with us. ML&S will have a wide range of their stock on show, as will LAM Communications. Waters and Stanton will have some new American gear on view.

There will also be everything from antenna hardware to software defined radio, Morse keys galore to antennas for every application. Last year the organisers noted that there was a lot of interest in components and there will be lots to browse. Antenna connectors and feeder will be available too.

After a busy summer with 2012 Olympics spectrum use, we hope that Ofcom will again be with us to offer advice and deal with your licensing questions.

NEWCOMERS TO THE SHOW. A newcomer to the show is Upshot Towers. They have been providing mast solutions to commercial companies for some time and are now branching out into the amateur market. They will have two towers on display, including a 30m mobile trailer mast that meets all safety requirements. They will also have a communications van with them that can be taken to remote locations to provide communications in all sorts of situations. The company also undertakes refurbishment of all kinds of masts.

There will be two companies represented at the show who specialise in amateur radio insurance. They will be very happy to discuss your requirements with you.

RSGB PRESENCE. We must not forget that there will be a number of RSGB headquarters staff at the show to assist on the huge bookstand, which can take quite a while to browse thoroughly. Remember you can save on postage by buying at the National Hamfest! Various committees that are administered by the Society will have representatives there and you can discuss everything from the QSL bureau to EMC and spectrum matters to planning.

CLUB STANDS. Clubs and amateur radio groups are very welcome as usual. BYLARA, RAIBC, RNARS and many others are attending again. Their stands not only offer them an opportunity to meet members but also fundraise for their activities often for the benefit of some less fortunate than some of us.

FLEA MARKET. Outside the main hall, we will be welcoming car booters to our flea market. They will, no doubt, have a vast range of things to sell. If you were at the show last year, you will know that there was a T1154 transmitter available – about as rare as rocking horse dung! That's one of the delights of the car boot area, you never know what you'll find. Details of flea market terms can be found on the National Hamfest website, www.nationalhamfest.org.uk.

BRING & BUY. RAF Waddington Amateur Radio Club is lending us their expertise by running the ever popular Bring & Buy stand, the biggest and best you will find at any amateur radio event in the UK (in our opinion). You can download a pre-booking in form on the website to save time on the day. All terms and conditions are there too.

TICKETS. As we've already publicised, we have pegged ticket prices this year at £4.50, despite rising costs. We are offering pre-booked tickets at discounts – and further reductions for bulk orders. Payments will be taken via our secure Paypal account that will accept credit cards and transactions from other Paypal account holders. We ask that you order by mid September to ensure timely deliver prior to the event (based on Royal Mail recommendations).

OTHER HIGHLIGHTS. For aspiring CW operators, we have Morse tests on demand. They are conducted by our friendly examiners, who are very welcoming and put you at your ease. Our information desk in the main hall entrance will have details.

As we go to press, we are working on a lecture programme with a number of contributors including Klaus Lohmann, DK7XL/DL0SDR, who will be talking about new developments in the increasingly popular software defined radio field.

Since last year we have made a number of catering refinements that will include a bar and hot food. There will be plenty of tables and chairs for those chats with old friends and colleagues. Enjoy the facilities and put the ham radio world to rights. There will be a number of RSGB officials around for you to put your ideas to about the future of the hobby and the Society.

Same old, same old? We don't think so. See you at the National Hamfest, George Stephenson Pavillion, Newark & Nottingham Showground, Lincoln Road, Winthorpe. Newark NG24 2NY. www.nationalhamfest.org.uk.

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Design Notes

More on small LF antennas plus a mixed bag of feedback

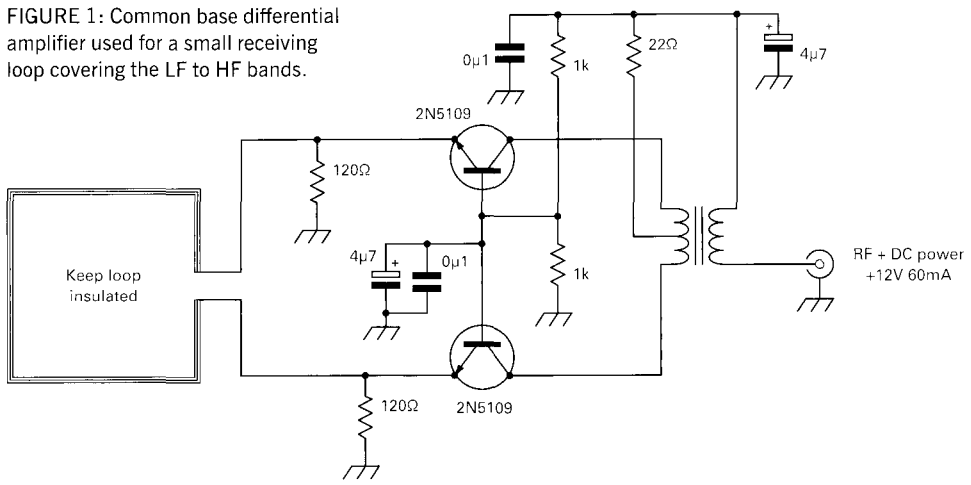

FIGURE 1: Common base differential amplifier used for a small receiving loop covering the LF to HF bands.

BROADBAND ACTIVE LOOPS. We saw last time how an electrically short whip (very much shorter than a wavelength) can show a more-or-less flat frequency response for receiving when followed by a high input impedance broadband amplifier. There is another type of broadband, receiving-only antenna, less well known in amateur circles, but used professionally in the communications intercept and direction finding world. It is the dual of the active whip: the active loop antenna. An electrically small loop – small here means the circumference is less than 10% of the wavelength – looks like a very small loss resistance in series with the fixed inductance of the loop. Compare this with the analogue of the short whip that appears as a very high resistance in parallel with a capacitance.

From basic electromagnetic theory we know the output potential into an open circuit from a single turn small loop of area A in a magnetic field of strength Ho is given by:

$V = 2\pi . \mu_o . A . Ho . F$
(where μo is the permeability of free space, $4\pi * 10^{-7}$)

In free space the magnetic field is directly related to the more commonly referred to electric field strength Eo by the impedance of free space, 120π, or 377Ω. So $Eo = Ho * 120\pi$.

Expressing frequency in MHz and using Eo instead of Ho, the equation simplifies to approximately

$V_{LOOP} = A . F . Eo / 48$

This exact relationship is often used for measurement of field strength by feeding the output of the untuned loop into a high impedance amplifier. The output of the loop is proportional to frequency, so we most certainly do not have the wanted flat frequency response.

But we know the loop consists of an inductance in series with a small resistance. The inductance has a reactance given by $XL = 2\pi . L$ and, for now, we'll assume the reactance is significantly larger than the loss resistance. This would usually be the case for loops operating at frequencies above a few tens of kHz. If we could feed the loop into a load, or amplifier, with zero input impedance then we could manage a flat frequency response. From Ohm's law, $I = V / XL$ and, as both the voltage from the loop and XL are proportional to frequency, this cancels. The current delivered into the (zero impedance) load now has a constant relationship with frequency. If there is series resistance present this will add in series with the reactance and the nice cancellation effect will roll off. The result is the loop now has high pass properties with a low end cutoff, where the response is 3dB down, when the reactance equals the total loss resistance. This resistance is made up from the loop's own loss resistance plus the input impedance of the amplifier. This latter term is for most practical purposes the major factor influencing the loop's low frequency performance. More information on small loop antenna can be found at [1].

LOW INPUT IMPEDANCE AMPLIFIER. So, how do we get a near-zero input impedance amplifier? The common base configuration does not appear so often these days, but offers a solution. The ideal, theoretical, input impedance of a bipolar transistor operated in common base is given by 1/(40 . Ie), where Ie is the emitter current. In practice it is a bit more than that due to resistance of the internal connecting leads and the silicon itself, but for RF power devices it is not very much more. So if we were to operate the device at 60mA, the input impedance as a common base stage becomes $1/(40 * 0.06) = 0.4\Omega$, which is pretty low! A loop has a floating output, so ideally the amplifier should have a balanced input. Figure 1 shows the circuit diagram of a simple loop amplifier I designed at work many years ago when we wanted to use a small horizontally mounted magnetic loop as an omnidirectional antenna to intercept horizontally polarised skywave HF signals.

One very big advantage of a differential amplifier – and not only in common base – is that decoupling and grounding of the reference electrode becomes less important; it is the connection between the two that is critical and this is nearly always direct. In this design, provided the two bases are strapped together tightly with a direct low impedance connection, any other path to ground does not carry signal current. The input impedance is doubled over the value for one device as both are now in series, but the actual input impedance achieved when running the two 2N5109 transistors at 60mA was of the order of 1Ω – quite close the predicted value.

PRACTICAL CONSIDERATIONS. Figure 1 is probably the simplest differential loop amplifier possible. The push-pull transmission line output transformer is not critical. It had a turns ratio of 1 – 1:1 and was wound using three lengths of trifilar-twisted wire around a ferrite toroid of uncertain heritage (but with enough inductance to allow operation down to a few tens of kHz). Broadband transmission line transformers for low power are remarkably efficient and easy to construct – the ferrite type only affects the lower frequency limit. See the October and November 2010 Design Notes for more on ferrites and transmission line transformers.

To avoid high value DC blocking capacitors in the low impedance input (with their potential series resistance and loss), the loop was connected directly between the emitters of the two transistors. DC biasing required a

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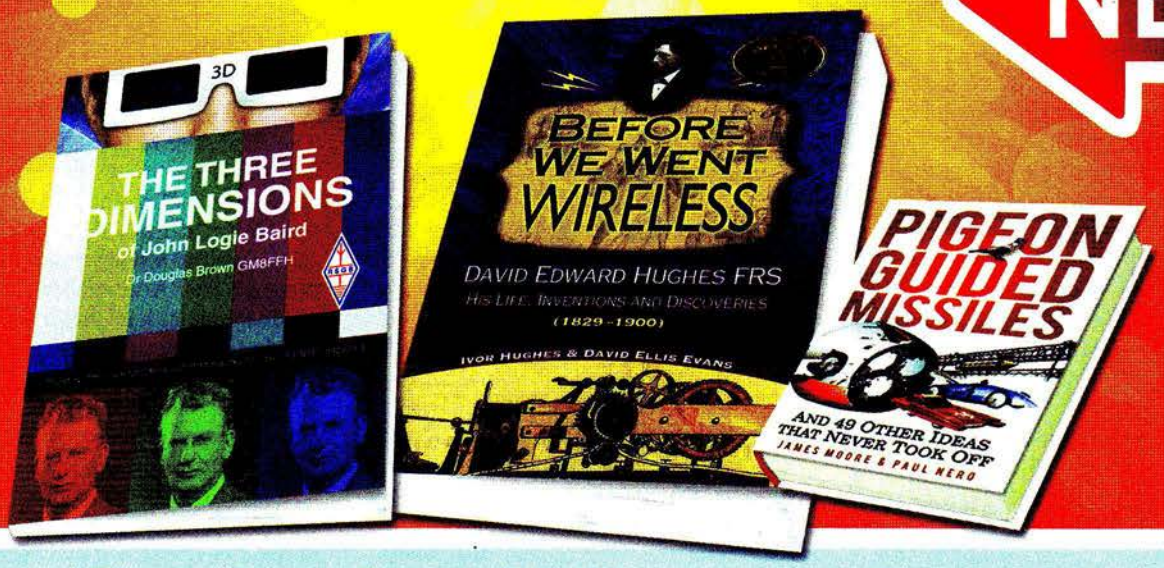

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The Three Dimensions of John Logie Baird

By Dr Douglas Brown, GM8FFH

John Logie Baird (1888-1946) is remembered as the inventor of television but his work in colour, 3D and holographic television is less well known. As are his contributions to other information sciences and their resulting technologies. This book sets out this work adding a perspective never seen before.

The Three Dimensions of John Logie Baird details Baird's story from his early years through, to his early development of television. He planted the seed, which has grown into a multinational, trillion dollar video and communications media industry. Baird is often dismissed as the person who invented a crude type of television that was quickly superseded but this book lays these criticisms to rest once and for all. For over a quarter of a century Baird developed monochrome, colour and 3D television, and many of the techniques he pioneered are still used in modern day systems. This book details how the systems worked and their later development after Baird's death.

The Three Dimensions of John Logie Baird is a fascinating read providing excellent reference work on his inventions.

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Before We Went Wireless

By Ivor Hughes & David Ellis Hughes

David Edward Hughes - His Life, Inventions, and Discoveries

This book is the first biography of the brilliant inventor and practical experimenter, David Edward Hughes. A contemporary of Edison and Bell, Hughes made major contributions in the fields of telegraphy, telephony, metal detection, and audio. His printing telegraph, adopted across much of Europe, made him a fortune. Hughes sent and received wireless signals in 1879, some sixteen years before Marconi, but faced with the scepticism of his peers, such that he discontinued his research, and his accomplishments were only recognised years later.

Before We Went Wireless details Hughes' life, focusing on both his work and his life itself. Hughes was thought of as a "child prodigy," who improved upon the telegraph, effectively doubling the rate of words per minute spread across the wires. Despite his contributions to society, Hughes' life and legacy are often overlooked and this book seeks to shed light on an extraordinary life. *Before We Went Wireless* contains over 100 prints, photographs, documents and is a fascinating read and reference guide to this important figure in the world of communications.

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Pigeon Guided Missiles

By James Moore and Paul Nero

And 49 Other Ideas That Never Took Off

This new hardback highlights those brilliant ideas that have for one reason or another never quite made it to being successful. All fifty concepts here border on the bizarre and laughable.

The *Pigeon-Guided Missiles* title of the book is drawn from the story of the WWII American psychologist who made the amazing discovery that pigeons could be trained to track objects and, when loaded into the nose cone of a missile, guide the weapon to its target. The book is full of similar stories such as the British Rail's plan for a spaceship, how Nelson nearly got a pyramid instead of a column, the scheme to cover Manhattan in a glass dome, nuclear-powered cars and much more.

Pigeon-Guided Missiles is full of fascinating stories from history that could have radically changed the world – yet somehow failed to take off.

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resistor from the two emitters to ground. So now the loop sits at a positive DC level above ground and had to be insulated. This was not a major issue as the 0.3m diameter loop was small and lightweight, being made from PVC insulated 2.5mm copper wire. The decoupling capacitors on the base do not contribute in any way to circuit operation, but are there to avoid the whole lot floating at RF and prevent potential instabilities. Without them, the whole amplifier is only tied to ground at RF through a few resistors. Since the base-emitter junctions are in parallel at DC, to maintain equal collector current in each device the two transistors should be matched. This is not terribly critical, and choosing two devices from the same batch should ensure sufficient balance in collector currents.

The inductance of that small loop was about 1μH so had 1Ω reactance for a 3dB point at 160kHz. Being one of the first stations to operate on the (then) 73kHz amateur band I had, of course, made sure the output transformer would go down that low and the loop did work quite satisfactorily down there. Overall, it worked quite well enough and allowed collection of the required signals over the whole of the HF band. I do not remember it suffering any overload problems, although with a bigger loop the amplifier may have begun to run into nonlinearity issues and started generating intermodulation products.

Another solution to a zero input impedance is to use an opamp as a virtual earth input. Feedback around the opamp ensures the voltages on positive and negative inputs are made equal, so, by definition the impedance seen looking into these two points must be zero. **Figure 2** shows how an opamp is used this way for a VLF loop. An input capacitor, Cin is needed – and this is quite critical. It must have a high value so reactance is negligible at the lowest frequency of interest and it must also have a low series resistance. For operation at VLF a value of several tens of μF is necessary. It should not be an electrolytic and, ideally, would be made up by paralleling many smaller value low ESR ceramic capacitors. The feedback resistor R works against the loss resistance and reactance of the loop to define the gain; a value of several tens to hundreds of ohms is typical. High frequency opamp technology has now reached a point where they offer

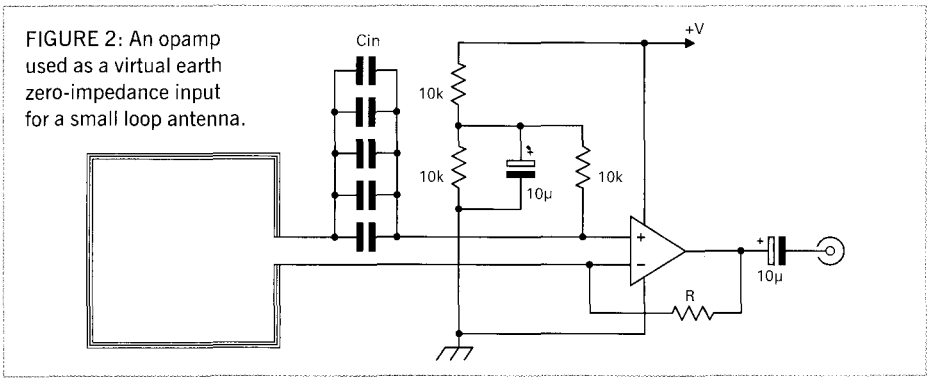

FIGURE 2: An opamp used as a virtual earth zero-impedance input for a small loop antenna.

comparable performance to high power common base amplifiers, but suitable devices are critical and somewhat expensive. For VLF only, standard audio opamps such as the NE5532 will be satisfactory, but are barely suitable for the 137kHz band with very small loops (where plenty of gain is needed). However, several professional loop antennas such as the Wellbrook use this approach.

Chris Trask, N7ZWY has come up with some improved circuit concepts using transformers to linearise the common base amplifier in what he calls 'Augmented Feedback'. A paper describing his technique can be found at **[2]**. [*By coincidence, an article by N7ZWY on design considerations for transformer feedback amplifiers appears elsewhere in this issue – Ed*].

DIRECT SAMPLING SDRS. Direct sampling is where the RF from the receive antenna is digitised after passing through no more than low pass filtering and perhaps a preamplifier, as illustrated in **Figure 3**. It is a technique that is becoming more widespread as the cost of suitable A/D converters plummets and their performance improves, thanks almost wholly to the mobile phone industry. At the moment, off the shelf chips can digitise to 16 bit resolution at sampling rates in excess of 100MHz. This is more than adequate to cover the entire HF spectrum in one go. As a consequence, several such receivers are available to amateurs. The SDR-IQ was probably the first to make a widespread appearance, followed by several others.

All direct sampling SDRs are hindered by one very practical limitation. Sampling to 16 bits at 100MHz generates 1.6G bits of information per second. That is an awful lot of data to deal with; no readily available interface is fast enough to get this reliably to a PC, even if the processor could work fast enough to use it. The solution is to use some on-board fast logic to do some pre-processing that reduces the data rate down to a manageable level that can be sent over a suitable interface. The pre-processing nearly always involves digital downconversion and filtering, so allowing a slower sampling rate. The data can then be sent over USB or Ethernet to a host PC (or whatever). The SDR-IQ uses an off-the-shelf digital downconverter chip and ends up at a maximum of 190kHz bandwidth, set by the capacity of the USB interface. Other, later offerings use logic made in custom gate arrays to format data sent over Ethernet or FireWire, allowing useable bandwidths of several hundreds of kHz.

NEW SDR. The Afedri SDR-Net from Israel is a new low cost entry to the field. With 12 bit sampling at 80MHz it allows 1.25MHz bandwidth to be sent over a LAN or USB 2.0 interface. It is compatible with *Linrad, Winrad, HDSDR, WRPlus, SDR console SDR-radio* software and, most importantly, costs around $250. More details can be found at **[3]**.

Also mentioned in *CQ-Ham Radio* is the SDR-49, which looks to be broadly similar. There is a web page, in Japanese, available via a Google translation at **[4]**. Alternatively, a web search for 'SDR-49' will find the original Japanese page.

FEEDBACK. Andrew, G4XZL comments: "After the March 2012 Design Notes article about vector demodulators I remembered that I used the U2794B in a design more than 10 years ago. I used it at 70MHz and it should work at 50MHz too but the trick is that you have to reduce the LO level. On advice from Temic, the original manufacturer,

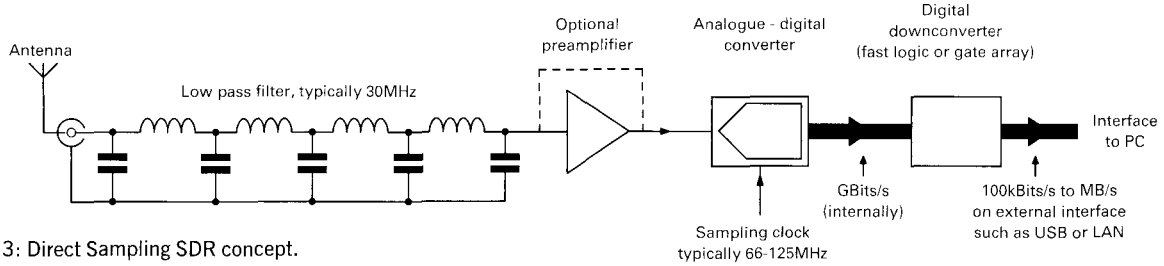

FIGURE 3: Direct Sampling SDR concept.

PHOTO 1: The Tenma 21-10135 SMT pre-heater.

they ecommended -22 to -12dBm for 50MHz and -23 to -12dBm at 70MHz. So unless Atmel have changed the silicon, it should still be applicable. I found one on an old board so might power it up and see if it still works. The big advantage with the Temic parts is the LO is at the RF frequency, which is convenient for use with the cheaper SI-570 or DDS."

Staying with I/Q downconverters, Clive, G7SVI pointed out the LTC5585 IQ demod chip that covers 700 – 3000MHz, or 400 to 4000MHz with reduced performance. Farnell sell this 24 pin QFP chip for around £10. Look on their site **[5]** for the data sheet.

Jon Joyce, GM4JTJ, sent this in:

"...responding to the plea at the end of your July *RadCom* column for ideas. Last year, after having been lent an old book on the history of electricity, it struck me that the humble germanium transistor had been somewhat overlooked due to the relatively fast introduction of the silicon devices. It started me thinking that the lower 'turn-on' voltage of a germanium device might lend itself to some novel applications and so I started thinking about self powered radios.

"Last summer, I started monitoring the potential on my long wire antenna over the course of 24 hour periods using a simple germanium diode doubler circuit and a digital voltmeter. I was staggered to see a maximum of almost 750mV at times. Generally speaking the voltage was at a maximum in the early hours of the morning, falling to tens of mV during the daylight hours. (Trying to wake up at intervals during the night to go out to the shack and take a reading was not the easiest of tasks!) Of course, a self powered radio that only works in the early hours of the morning is not of much use, but I still feel there ought to be some merit in further work into the subject."

And finally... Dave, G8OQW referred me to **Photo 1**, a low cost pre-heater by Tenma for working with surface mount technology. At £36 plus VAT from Farnell [5], this is seriously cheaper than any other similar product and well worth considering. It blows hot air onto the underside of the PCB to raise it to a suitable temperature. While just about capable of reaching the solder melting point for reflowing, it struggles to get there and is really aimed at reworking. This is where the PCB is maintained at a temperature below the solder melting point, with additional heat provided by a soldering iron just where it is needed.

WEBSEARCH

[1] More on magnetic loop antennas – www.vlf.it/looptheo7/looptheo7.htm and www.lz1aq.signacor.com/docs/wsml/wideband-active-sm-loop-antenna.htm

[2] Linearisation of common base amplifiers by 'augmentation' – http://images.rfdesign.com/files/4/1099Trask32.pdf

[3] Afedri SDR-Net SDR – http://4z5lv.net/index.php/afedri-sdr-net-description

[4] SDR-49 - http://tinyurl.com/RC-DN-0912

[5] Farnell – http://uk.farnell.com then search for 21-10135 for the SMT pre-heater or LTC5585 for the 3GHz downconverter IC

Transformer feedback amplifiers: variations on a theme

Transformer feedback amplifiers are valuable when designing high dynamic range receivers; these topology options and equations should help ease the advanced designer to produce better performing amplifiers

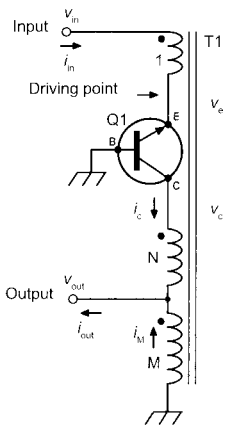

FIGURE 1: Basic Norton transformer feedback amplifier.

INTRODUCTION. For designers of radio receivers, amplifiers having low intermodulation distortion (IMD) together with low noise figure (NF) are highly desirable. Of the many circuit topologies that are available to fulfil this need [1, 2, 3, 4], those consisting of a single transistor together with a multiple winding transformer have proven to provide exceptional performance while at the same time their overall simplicity makes them an attractive and cost-effective solution. Here, we review three existing topologies as well as an additional arrangement that overcomes some limiting factors of the earlier designs.

GENERALISATIONS. In the transformer feedback amplifier topologies to be reviewed here, a single transformer having three or four windings is combined with a single transistor. Despite their perceived simplicity, such combinations are capable of surprisingly good IMD and NF performance, even when using transistors that might be considered as being of marginal performance.

Typically, the transformer has one winding that establishes the voltage gain relative to an input winding, while the current gain is maintained by the remaining turn or turns. In the majority of cases, the transformer turns ratios are such that twisted bifilar and trifilar wires are not practical when non-ideal disturbances such as base-emitter voltages and finite current gains are taken into account. This places some serious demands in the design of the transformer, but not such as to render the topologies as being impractical or otherwise unworthy of consideration.

The collector load resistance, R_C, limits both the saturated power and the high frequency cutoff of the amplifier, but is rarely given much attention. As we shall see shortly, in some amplifier topologies R_C rises rapidly as the turns ratios of the transformer are increased to obtain higher gain, depriving the amplifier of both dynamic range and bandwidth.

With respect to the amplifier dynamic range, the IMD performance is closely related to the 1dB compression point (P_{1dB}), which, in turn is related to the saturated power of the amplifier. The maximum peak power that can be obtained is a result of R_C, the combination of the quiescent collector-emitter voltage (V_{CE}) and the collector saturation voltage ($V_{CE(SAT)}$) of the transistor is:

$$P_{max} = \frac{(V_{CE} - V_{CE(SAT)})^2}{R_C} \quad (1)$$

With respect to the amplifier frequency bandwidth, the high cutoff frequency dependency on R_C is a result of the collector-emitter and collector-base capacitances of the transistor (C_{oss} and C_{rss}, respectively) as well as the net capacitance across the windings of the transformer (C_{XFMR}):

$$f_{max} = \frac{1}{R_C(C_{oss} + C_{rss} + C_{XFMR})} \quad (2)$$

Other factors, such as the leakage inductances of the transformer and stray capacitance to ground, serve to further lower f_{MAX}. The transistor capacitances of Equation 2 in conjunction with R_C represent a serious obstacle to higher frequency designs; variations of the basic lossless feedback topology, discussed later, serve to alleviate this problem.

THE NORTON TRANSFORMER FEEDBACK AMPLIFIER. The most popular topology for transformer feedback amplifiers is that which was devised by Dr David Norton in the 1970s [5, 6, 7], which is what most designers are referring to when the subject of 'lossless feedback' amplifiers is brought up. The Norton amplifier has been widely used in telecommunications, radio astronomy [8], and in high dynamic range mixers [9, 10, 11].

Shown in basic form in **Figure 1**, the transformer consists of an input winding that is coupled to the emitter of a common-base amplifier, with a pair of output windings that couple the collector to the output. The amplifier voltage gain is determined by the ratio between the input winding and the output M winding, while the current gain is determined by the relationship between these first two windings and the output N winding.

The transistor emitter is a virtual ground and constitutes the amplifier drive point. Ignoring for the moment the effects of the finite emitter signal voltage, the signal gain of a Norton amplifier having equal input and output impedances is determined by:

$$A_V = \frac{V_{out}}{V_{in}} = \left| \frac{i_{out}}{i_{in}} \right| = M \quad (3)$$

The amplifier gain is then determined by:

$$G = 20 \log A_V = 20 \log M \quad (4)$$

To satisfy the current relationship of Equation 3,

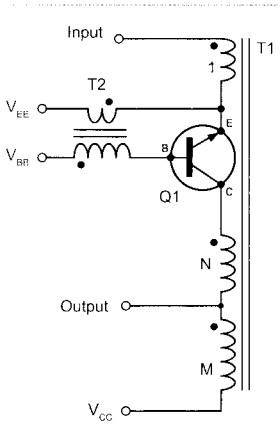

FIGURE 2: Adding linearity augmentation to the Norton lossless feedback amplifier.

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the signal current in winding M is determined by:

$$i_M = i_{out} - i_N = (A_V - 1)i_{in} = (M - 1)i_{in} \quad (5)$$

and the transformer balance is seen by way of:

$$M\,i_M = i_{in} + N\,i_N = i_{in} + N\,i_{in} = \\ = (1 + N)i_{in} \quad (6)$$

Substituting Equation 5 into Equation 6, we obtain:

$$M(M-1)i_{in} = (M^2 - M)i_{in} \\ = (1 + N)i_{in} \quad (7)$$

This results in the following relationship for determining the transformer turns ratio N:

$$N = M^2 - M - 1 \quad (8)$$

In reality, the finite signal voltage at the transistor emitter disturbs the gain relationship of Equation 3, and the turns ratio M must be adjusted to compensate for the lower voltage across the input winding:

$$M' = \frac{A_V\,v_{in}}{v_{in} - v_e} \quad (9)$$

This requires that the emitter signal voltage v_e be determined with respect to the input signal voltage v_{in}, which can be accomplished either by simulation or by direct measurement.

The finite current gain of the transistor dictates that the collector current will be slightly less than the emitter current and, together with the effects of the finite emitter voltage, an adjustment in the turns ratio N is needed in order to achieve the desired current gain:

$$N' = \frac{M'(A_V\,h_{fe} - h_{fe} - 1) - h_{fe}}{h_{fe} - 1} \quad (10)$$

where h_{fe} is the signal current gain of the transistor. In cases where h_{fe} is sufficiently high, the turns ratio N' can be comfortably approximated as:

$$N' \approx M'A_V - M' - 1\Big|_{h_{fe} >> A_V} \quad (11)$$

The problem of the finite emitter signal voltage can be substantially reduced by adding a second transformer, as shown in **Figure 2**. This method, known as augmentation **[12, 13]**, reduces the emitter signal voltage by passively magnifying and inverting it and then applying it to the transistor base, effectively creating a second negative-feedback loop within the amplifier. With a T2 turns ratio of 1:3, the apparent emitter input resistance can be reduced by as much as 95%. Doing so allows the designer to use the ideal design equations, which in some circumstances can result in transformers that can be made with twisted wires, which will further improve the IMD performance **[14, 15]**. Also notice in Figure 2 that this second transformer provides a convenient means for applying bias to the emitter.

The transformer winding N in the Norton amplifier presents a problem in terms of the dynamic range of the amplifier by virtue of the fact that the collector signal voltage is always higher than the output signal voltage:

$$v_c = (M + N)v_{in} \\ \approx (A_V^2 - 1)v_{in} > A_V\,v_{in} \quad (12)$$

actually increasing rapidly as the amplifier gain A_V is increased:

$$\frac{v_{cc}}{v_{out}} \approx \frac{v_c}{v_{out}} = \frac{A_V^2 - 1}{A_V} \to \infty\Big|_{A_V >>} \quad (13)$$

while at the same time the collector signal current remains virtually constant for all values of A_V:

$$i_c \approx i_e \quad (14)$$

so that the transistor contributes less to the total amplifier output current as the amplifier gain A_V is increased:

$$\frac{i_c}{i_{out}} = \frac{1}{A_V} \to 0\Big|_{A_V >>} \quad (15)$$

The transformer winding N in the Norton amplifier also presents a problem in terms of the frequency range of the amplifier by virtue of the fact that the collector load resistance R_C increases rapidly as the amplifier gain A_V is increased:

$$R_C = R_L(A_V^2 - 1) \to \infty\Big|_{A_V >>} \quad (16)$$

This is not to say that the Norton amplifier compares unfavourably with other transformer feedback amplifier topologies. Given its usage of a common-base transistor configuration, the Norton amplifier can attain higher cutoff frequencies than can comparable amplifier topologies that utilise common-emitter configurations. In general terms, the practical limit for the high-frequency cutoff for a common-base transistor amplifier is half the transition frequency (f_T) of the device, whereas for a common-emitter amplifier the practical limit is a tenth the transition frequency.

In addition to the frequency advantages of the Norton amplifier, by applying augmentation and taking advantage of opportunities to construct the transformer with combinations of twisted wires, very high levels of linearity can be attained [14, 15].

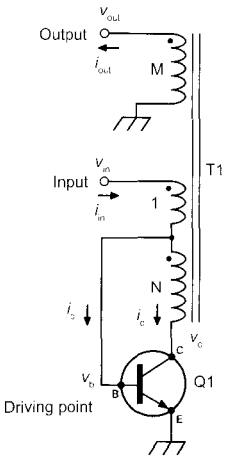

FIGURE 3: Basic O'Dell transformer feedback amplifier.

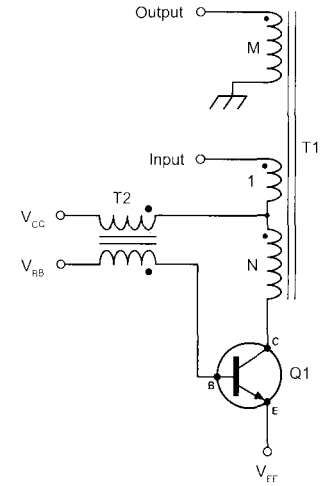

FIGURE 4: Biasing method for the O'Dell transformer feedback amplifier.

THE O'DELL TRANSFORMER FEEDBACK AMPLIFIER A second form of transformer feedback amplifier that utilises a transformer with three windings is that which was devised by Thomas O'Dell **[16]**. Shown in **Figure 3**, the base of the transistor is a virtual ground and constitutes the amplifier driving point. Under ideal conditions where there is no base signal voltage, the signal gain of an O'Dell amplifier having equal input and output impedances is determined by:

$$A_V = \left|\frac{v_{out}}{v_{in}}\right| = \frac{i_{out}}{i_{in}} = M \quad (17)$$

The amplifier gain is then determined by:

$$G = 20\log A_V = 20\log M \quad (18)$$

The current gain relationship of Equation 17 allows us to easily determine the signal current of transformer winding M:

$$i_M = i_{out} - M\,i_{in} - A_V\,i_{in} \quad (19)$$

We next observe the expression for the transformer balance, which is:

$$N\,i_N = N\,i_{in} = M\,i_M - i_{in} = \\ = M^2\,i_{in} - i_{in} = i_{in}(M^2 - 1) \quad (20)$$

Substituting Equation 19 into Equation 20 results in the following expression for determining N:

$$N = M^2 - 1 = A_V^2 - 1 \quad (21)$$

As with the Norton amplifier, the finite signal voltage at the transistors emitter disturbs the gain relationship of Equation 21, and the turns ratio M must be adjusted to compensate for the lower voltage across the input winding:

$$M' = \frac{A_V\,v_{in}}{v_{in} - v_b} \quad (22)$$

Like the Norton amplifier, this requires that

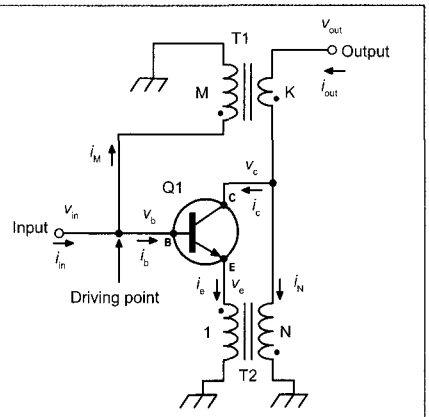

FIGURE 5: Basic Wagner transformer feedback amplifier.

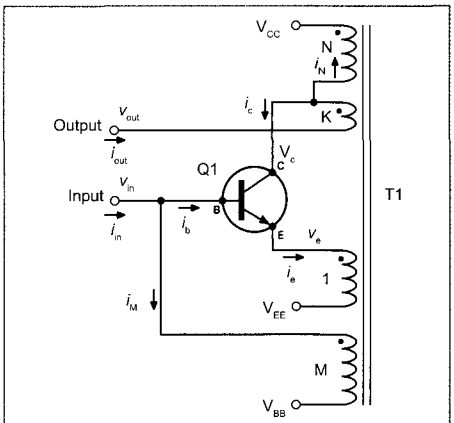

FIGURE 6: Single transformer Wagner transformer feedback amplifier.

the base signal voltage v_b be determined with respect to the input signal voltage v_{in}, either by simulation or direct measurement.

The finite current gain of the transistor does not have as serious an effect on determining the turns ratio N for the O'Dell amplifier as with the previous Norton amplifier. To achieve the desired current gain the transformer turns ratio N is adjusted by:

$$N' = \frac{(M'^2 - 1)(h_{fe} - 1)}{h_{fe}} \quad (23)$$

that, if the h_{fe} of the transistor is sufficiently high, can be comfortably approximated as:

$$N' \approx (M'^2 - 1)\Big|_{h_{fe} >> A_V} \quad (24)$$

Applying base and collector bias to the O'Dell amplifier is not as simple as with the Norton amplifier, however a second transformer may be added to the circuit, as shown in **Figure 4**, which not only fulfils this need but that also provides a means of increasing the transistor gain, which in turn decreases the base signal voltage seen at the junction of the input and N windings.

As with the Norton amplifier, the transformer winding N in the O'Dell amplifier presents a problem in terms of the dynamic range of the amplifier by virtue of the fact that the collector signal voltage is always higher than the output signal voltage:

$$v_c = (M+N)v_{in} \approx \approx (A_V^2 - 1)v_{in} > A_V v_{in} \quad (25)$$

and, as expected, increases rapidly as the amplifier gain A_V is increased:

$$\frac{v_{ce}}{v_{out}} = \frac{v_c}{v_{out}} = \frac{A_V^2 - 1}{A_V} \rightarrow \infty\Big|_{A_V \rightarrow \infty} \quad (26)$$

while at the same time the collector signal cur-rent remains virtually constant for all values of A_V:

$$i_c \approx i_e \quad (27)$$

so that the transistor contributes less to the total amplifier output current as the amplifier gain A_V is increased:

$$\frac{i_c}{i_{out}} = \frac{1}{A_V} \rightarrow 0\Big|_{A_V \rightarrow \infty} \quad (28)$$

Also as with the Norton amplifier, the transformer winding N in the O'Dell amplifier presents a problem in terms of the frequency range of the amplifier by virtue of the fact that the collector load resistance R_C increases rapidly as A_V is increased:

$$R_C = (A_V^2 - 1) R_L \rightarrow \infty\Big|_{A_V \rightarrow \infty} \quad (29)$$

In terms of frequency response, the O'Dell amplifier compares unfavourably with the Norton amplifier for no reason other than the distinct difference in the practical limit for the high cutoff frequency between the common-base and common-emitter transistor amplifier configurations. For a given gain, transistor, and biasing condition, the practical frequency limit of the O'Dell amplifier is a fifth that of the Norton amplifier.

THE WAGNER TRANSFORMER FEEDBACK AMPLIFIER. This is an interesting form of transformer feedback amplifier that utilises a pair of 2-winding transformers, which can be further realised by way of a single transformer with four windings. It was devised by William Wagner **[17]**. Shown in **Figure 5**, the Wagner amplifier has two negative feedback loops, the first being the current feedback loop provided by transformer T1; the second is the voltage feedback loop provided by transformer T2.

Under ideal conditions where the transistor has infinite gain and there is no base signal current, the signal gain of the Wagner amplifier having equal input and output impedances is determined by:

$$A_V = A_I = \left|\frac{i_{out}}{i_{in}}\right| = \left|\frac{v_{out}}{v_{in}}\right| = \frac{M}{K} \quad (30)$$

and the amplifier gain is then determined by:

$$G = 20 \log A_V = 20 \log \frac{M}{K} \quad (31)$$

To determine the turns ratio N of transformer T2, we must first determine the collector voltage v_c that results from the voltage drop across winding K of transformer T1:

$$v_c = v_N = -A_V v_{in} + \frac{K v_{in}}{M} = -A_V v_{in} + \frac{v_{in}}{A_V} = v_{in}\left(\frac{1 - A_V^2}{A_V}\right) \quad (32)$$

This then allows the turns ratio N to be conveniently determined by:

$$N = \frac{v_c}{v_e} = \frac{v_c}{v_{in}} = \frac{A_V^2 - 1}{A_V} \quad (33)$$

As was mentioned earlier, the Wagner amplifier can be realised with a single transformer, as shown in **Figure 6**. Under ideal conditions where the base-emitter voltage v_{be} of the transistor is zero, the signal voltage at the emitter is equal to the input signal voltage and the turns ratio M is reduced to unity:

$$M = 1 \quad (34)$$

As with the Norton and O'Dell amplifiers, the finite signal voltage at the transistors emitter disturbs the current and voltage gain relationships of Equation 30 and Equation 33, respectively. In addition, the finite current gain of the transistor further disturbs these relationships. To begin, the turns ratios M and N must be adjusted to compensate for the lower emitter signal voltage:

$$M' \approx \frac{v_{in}}{v_e} > 1 \quad (35)$$

$$N' \approx \frac{v_c}{v_e}\left(\frac{A_V^2 - 1}{A_V}\right) \quad (36)$$

This again demonstrates that the emitter signal voltage v_e needs to be determined with respect to the input signal voltage v_{in}.

The finite current gain of the transistor does not have a serious effect on determining the voltage gain for the single-transformer Wagner amplifier, however it does have a minor effect on the current gain and the adjustment may be readily achieved by:

$$K' = \frac{M'}{A_V} - \frac{M' N'}{h_{fe} N' + h_{fe} + 1} \quad (37)$$

If the h_{fe} of the transistor is sufficiently high, this can be comfortably approximated as:

$$K' \approx \frac{M'}{A_V}\Big|_{h_{fe} >> A_V} \quad (38)$$

As can be seen readily in Figure 6, the Wagner amplifier does not require any additional circuit components to assist in applying bias, as was required in the earlier Norton and O'Dell amplifiers, which is both elegant and cost-effective. In addition, the Wagner amplifier does not share the rapid rise in collector signal voltage as with the Norton and O'Dell amplifiers. Instead, the collector signal voltage is always less than the output signal voltage:

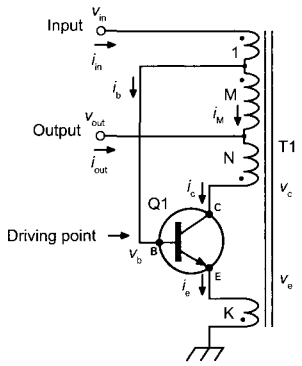

FIGURE 7: Introduced transformer feedback amplifier.

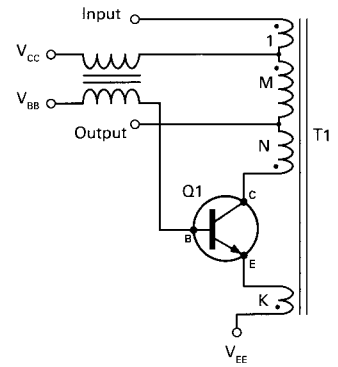

Figure 8: Biasing method for the introduced transformer feedback amplifier.

$$v_c = v_{in}\left(\frac{1-A_V^2}{A_V}\right) < A_V\, v_{in} \quad (39)$$

For the Wagner amplifier, the emitter signal voltage is slightly less than the input signal voltage, and the total collector-emitter signal voltage is actually higher than the output signal voltage:

$$\frac{v_{ce}}{v_{out}} = \frac{v_c - v_e}{v_{out}} \approx \frac{v_c - v_{in}}{v_{out}} = \frac{A_V^2 + A_V - 1}{A_V^2} \rightarrow 1\Big|_{A_V\rightarrow\infty} \quad (40)$$

This detracts from the otherwise favourable dynamic range characteristics. At the same time the transistor collector current increases with the desired gain but is always less than the output signal current:

$$i_c = -A_V\, i_{in}\left(\frac{A_V^2 - 1}{A_V^2 + A_V - 1}\right) \quad (41)$$

Consequently:

$$\frac{i_c}{i_{out}} = \frac{A_V^2 - 1}{A_V^2 + A_V - 1} \rightarrow 1\Big|_{A_V\rightarrow\infty} \quad (42)$$

The Wagner amplifier also enjoys a considerably lower transistor collector load resistance than either the Norton or O'Dell amplifiers:

$$R_C = R_L\left(\frac{A_V^2 + A_V + 1}{A_V^2}\right) \rightarrow R_L\Big|_{A_V\rightarrow\infty} \quad (43)$$

which gives the Wagner amplifier a distinct advantage in terms of frequency response over the O'Dell amplifier, and can exceed that of the Norton amplifier above a certain gain level, as will be seen later.

A NOVEL TRANSFORMER FEEDBACK AMPLIFIER. The degradation of the dynamic range of the Wagner amplifier by way of the emitter signal voltage detracts from the otherwise overly attractive nature of the topology, however the dual-loop feedback and the lower collector signal voltage provided by transformer winding K is worthy of further consideration.

By combining these features with the topology of the O'Dell amplifier, a novel topology in which the voltage feedback is a positive feedback loop can be devised, as shown in **Figure 7**. Amplifier topologies that incorporate both positive and negative feedback loops, known as 'balanced feedback' **[18]** are inherently stable provided that the positive feedback loop is internal to the negative feedback loop and is of lower gain. Amplifiers employing embedded positive feedback loops have been shown to have improved gain and noise performance **[19, 20]**.

In the initial steps of the design, the transformer winding K develops a signal voltage that is less than (for unconditional stability) and of opposite phase of the transistor base-emitter voltage v_{be}:

$$K < \frac{v_{bc}}{v_{in}} \quad (44)$$

This is convenient as the transistor base is now a virtual ground and the output signal voltage is developed across the transformer winding M, which is now determined by the simple relationship:

$$A_V = \left|\frac{v_{out}}{v_{in}}\right| = M \quad (45)$$

and the amplifier gain is then determined by:

$$G = 20\log A_V = 20\log M \quad (46)$$

To satisfy the current relationship of Equation 45, the signal current in windings N and K is determined by satisfying the transformer balance, which is:

$$N\, i_N + K\, i_K = (N+K)i_N = i_{in} + M\, i_M = (M+1)i_{in} \quad (47)$$

Knowing that:

$$i_N = i_M + i_{out} = -(M+1)i_{in} \quad (48)$$

we can derive the following simple relationship for the turns ratio N:

$$N = 1 - K \quad (49)$$

The finite current gain of the transistor has no effect on either the K or M windings since they determine the emitter and output signal voltage relationships. However, the finite current gain does have a slight effect in determining the value of N:

$$N' = 1 + \frac{1-A_V}{h_{fe}} - \frac{K(h_{fe}+1)}{h_{fe}} \quad (50)$$

If h_{fe} is sufficiently large, this reduces to:

$$N' \approx 1 - K'\big|_{h_{fe}>>A_V} \quad (51)$$

The introduced amplifier shares the same desirable collector voltage characteristics of the Wagner amplifier, which is that the collector signal voltage is always less than the output signal voltage:

$$v_c = (N-M)v_{in} = (1-A_V)v_{in} < A_V\, v_{in} \quad (52)$$

The dynamic range of the introduced amplifier is higher than that of the Wagner amplifier due to the fact that the emitter signal voltage is now considerably lower than that of the Wagner amplifier:

$$\frac{v_{ce}}{v_{out}} \approx \frac{v_c}{v_{out}} = \frac{A_V - 1}{A_V} \rightarrow 1\Big|_{A_V\rightarrow\infty} \quad (53)$$

In contrast, the collector signal current of the introduced amplifier decreases as the amplifier gain is increased but is always higher than the output signal current:

$$i_c = -(A_V+1)i_{in} > -A_V\, i_{in} \quad (54)$$

and approaches the output signal current as the amplifier gain is increased:

$$\frac{i_c}{i_{out}} = \frac{A_V+1}{A_V} \rightarrow 1\Big|_{A_V\rightarrow\infty} \quad (55)$$

The introduced amplifier enjoys a lower transistor collector load resistance than that of any of the earlier amplifiers:

$$R_C = R_L\left(\frac{A_V - 1}{A_V + 1}\right) \rightarrow R_L\Big|_{A_V\rightarrow\infty} \quad (56)$$

This gives the introduced amplifier a distinct advantage in terms of frequency response over both the O'Dell and Wagner amplifiers, as well as over that of the Norton amplifier, as will be seen shortly.

Applying base and collector bias to the introduced amplifier bears the same inconvenience as with the O'Dell amplifier and, just as with that case, a second transformer may be added to the circuit, as shown in **Figure 8**, which also provides a means of increasing the transistor gain, but which has little of any consequence to the design equations as the junction between the input winding and the M winding will remain as a virtual ground.

A COMPARISON OF DESIGN PARAMETERS. A variety of design parameters for the four amplifier topologies discussed here appears in **Table 1**, listed for four levels of gain. In all cases, the transformer turns ratios are listed with respect to an input winding turn ratio of unity, and are for ideal conditions where the transistor base-emitter voltage is zero and the signal current gain is infinite. For this reason, the turns ratios of N and K for

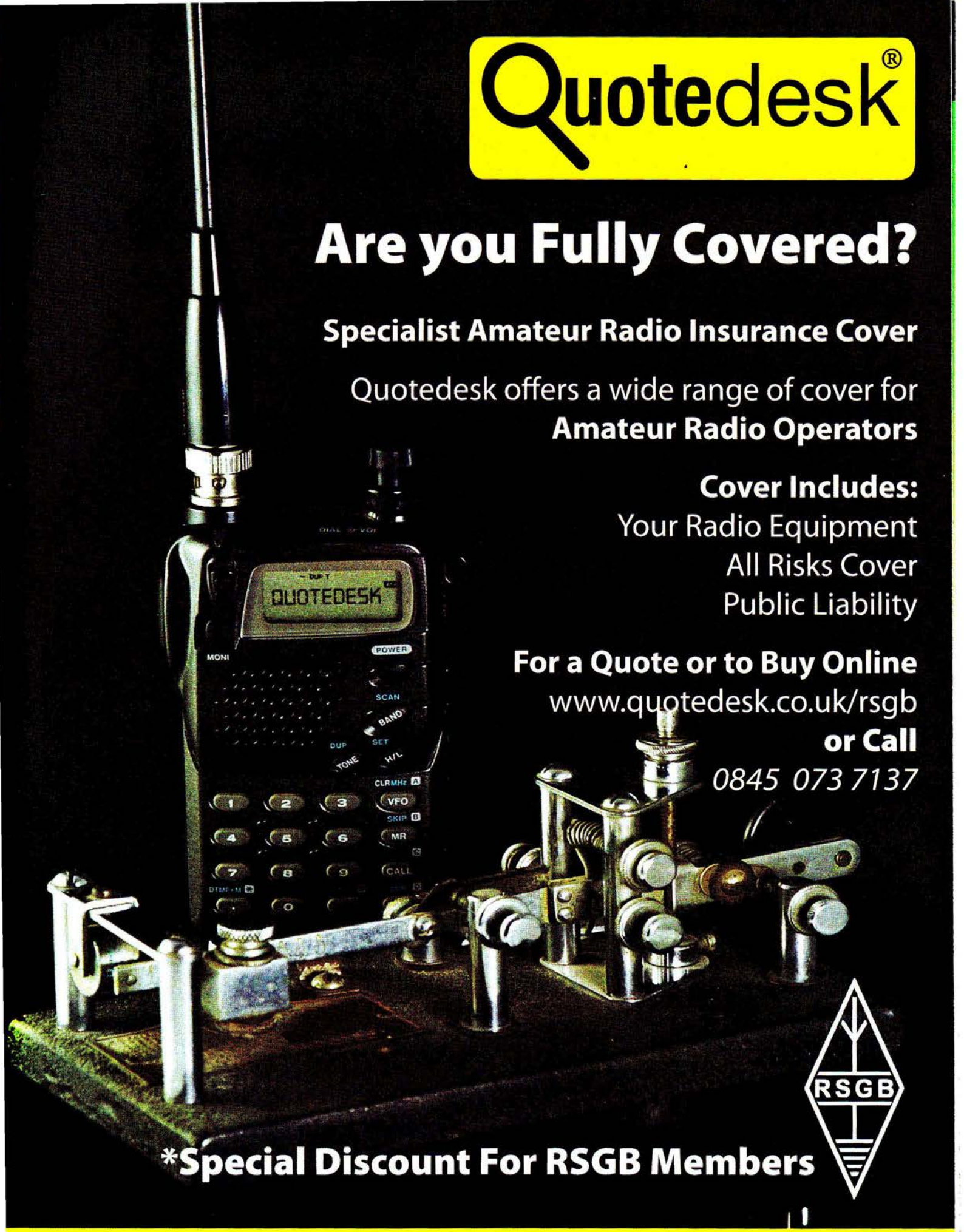

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TABLE 1: Transformer feedback amplifier design parameters.

---------Amplifier---------		----------Transformer----------				----------Transistor----------		
Topology	Gain (dB)	M	N	K	N+K	V_{ce}/V_{out}	I_c/I_{out}	R_c/R_{load}
Norton	6.02	2	1			1.50	0.50	3.00
O'Dell	6.02	2	3			1.50	0.50	3.00
Wagner	6.02	1	1.50	0.50		1.25	0.60	1.75
Introduced	6.02	2			1	0.50	1.50	0.33
Norton	9.54	3	5			2.67	0.33	8.00
O'Dell	9.54	3	8			2.67	0.33	8.00
Wagner	9.54	1	2.67	0.33		1.22	0.73	1.44
Introduced	9.54	3			1	0.67	1.33	0.50
Norton	12.04	4	11			3.75	0.25	15.0
O'Dell	12.04	4	15			3.75	0.25	15.0
Wagner	12.04	1	3.75	0.25		1.19	0.79	1.31
Introduced	12.08	4			1	0.75	1.25	0.60
Norton	13.98	5	19			4.80	0.20	24.0
O'Dell	13.98	5	24			4.80	0.20	24.0
Wagner	13.98	1	4.80	0.20		1.16	0.83	1.24
Introduced	13.98	5			1	0.80	1.20	0.67

the introduced amplifier are listed in a single column as a sum as the turns ratio K is dependent upon the transistor base-emitter voltage, which in this comparison is zero for convenience.

With regard to the transformer turns ratios, we can readily observe that the O'Dell amplifier has the highest total number of turns, followed closely by the Norton amplifier. In stark contrast, for gains of 9.54dB ($A_V = 3$) the Wagner amplifier and the amplifier introduced herein have a significantly lower total number of turns. This is a very important consideration with regard to the design and construction of the transformer proper, as an increase in the total number of turns on a given core will result in higher losses (both bulk and induced), higher leakage inductance and higher inter- and intra-winding capacitances. The higher losses will result in a lower saturated power level and subsequent lesser IMD performance, while the higher reactive parasitics will result in a decrease in the high cutoff frequency.

Using Equation 2, the collector load resistances reveal that the high frequency cutoff for the Norton and O'Dell amplifiers decreases rapidly with increased gain, both amplifiers losing 80% of their bandwidth when going from an amplifier with 6.02dB of gain to one with 12.04dB of gain, which is a substantial penalty to pay for doubling the gain. At the same time, the high frequency cutoff for the introduced amplifier decreases by 50% with the same change in gain while the Wagner amplifier actually increases by 33%.

Further review of the collector load resistances using Equation 1 shows that both the Norton and O'Dell amplifiers lose 7.0dB of potential saturated power when going from 6.02dB to 12.04dB of gain, while the introduced amplifier loses about 2.6dB. Interestingly, when taking the ratio of collector to collector-emitter signal voltage into account, the potential saturated power of the Wagner amplifier actually increases.

PRACTICAL CONSIDERATIONS. In the design of transformer feedback amplifiers, the careful design and construction of the transformer is essential [21]. Particularly for higher frequencies, the amount of wire used will determine the bulk (resistive) losses, while the number of turns and how they are distributed on the core will determine the leakage inductance, inter- and intra-winding capacitances, as well as the transformer coupling coefficient.

The choice of magnetic material used in the core will play a significant role in the losses of the transformer and may become a significant contributor to the high frequency cutoff, especially in designs such as those where twisting wires together is impractical and the coupling between the windings is more a matter of magnetic flux linking in the core rather than the inter-winding capacitance coupling of twisted wire transmission line.

In designs where twisted wires are impractical, the magnetic material should have a ferromagnetic resonance frequency that is at least twice the desired maximum frequency of the amplifier. Then, the size of the core and the size of the wire are selected so as to adequately cover the desired frequency bandwidth while restricting the windings to a single layer, ensuring uniform coupling to the core while at the same time minimising any leakage inductance.

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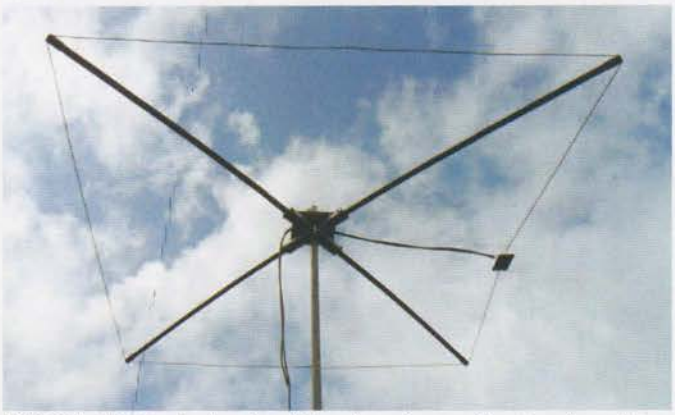

PHOTO 1: The 6m 2-ele collapsible antenna in operational configuration.

INTRODUCTION. As Solar Cycle 24 builds, giving the expected improvement in 50MHz propagation, I developed a collapsible 50MHz two-element wire beam antenna (**Photo 1**). It is intended for portable use, as a loft antenna, or anywhere that available space is at a premium. The antenna is equally straightforward to set up and fold down after use. It fits into a space of approximately 25cm x 25cm x 1m long (**Photo 2**), making it suitable to carry in the boot of a small car.

DEVELOPMENT. The original intention was for a traditional two-element 50.15MHz beam with a spacing of 1.5m used between the reflector and driven element (about 0.25 wavelength), as shown in **Figure 1**. I realised that the antenna needed less space if the elements are folded into an oblong shape (**Figure 2**), in a similar manner to a Moxon or VK2ABQ type beam.

PHYSICAL CONSTRUCTION. The heart of the antenna is a 150mm square piece of plywood, to which four 1m lengths of plastic conduit are hinged. This allows the antenna to be folded up. The antenna elements are supported by the lengths of conduit. **Photo 3** shows the general arrangement of the homebrew hinges.

First, a 50mm hole was cut in the centre of the plywood board to allow the antenna to be attached to a mast, described in more detail later.

Eight runners were made up to form the hinges for the plastic conduit legs. These were 11cm long and fabricated from 10 x 15mm scrap aluminium oblong tubing. Batten wood should work equally well if suitable aluminium oblong tubing is not available.

Four holes were drilled in each runner as follows: starting from one end, drill two 5mm holes at 15mm and 50mm right through the narrower sides. These holes will allow each runner to be screwed to the plywood board. Then drill two 4mm holes through the longer sides at 102mm and 32mm along each runner. Photo 3 shows how these holes are arranged.

Each hinge was formed using two runners, screwed on the plywood board 21mm apart, aligned equally either side of the diagonal across the square board, with the ends flush with 50mm central hole. This leaves 45mm of runner protruding from the plywood board's edge, with a 4mm hole at each end. These are the hinge holes for the plastic conduit legs.

Each plastic conduit leg was drilled with two 4mm holes, at 18mm and 88mm, to match up with the two 4mm holes within each runner assembly. A suitably long nut and bolt was used to secure each plastic conduit leg, so forming the hinge at the protruding end of the runner assembly.

Holding the plywood board with the hinges containing the plastic conduit legs underneath, the conduit legs self-lock against the plywood board under gravity, forming the X frame for the antenna. If required, a securing nut and bolt can be used to fix each conduit leg in place using the second 4mm hole within each hinge assembly. When completed, the total diagonal length across the X was 2.08m.

20mm plastic conduit connector pieces were used to hold the wire beam in place at the end of each conduit pipe leg. A 4mm hole was drilled through the end of each connector piece to allow the wire to be threaded through. This allows ease of removing the antenna from the X frame to store it away when not in use.

The upper surface of the plywood board has two mild steel metal brackets mounted 90° apart with the 'fold' of each bracket set flush with the 50mm central hole. This allows the antenna to be mounted on a mast using a suitable clamp, for example a hose clamp. The mast mounting arrangements are shown in **Photo 4**.

ANTENNA ELEMENTS. The driven element is a half wavelength dipole cut for 50.150MHz. The length was found, from experimentation, to be 2.88m for the 5A-rated copper single stranded cable I used. The reflector was made from the same cable but cut about 8% longer than the dipole, at 3.11m in length.

Before making up the beam, the four 20mm plastic conduit connector pieces mentioned earlier were threaded onto the legs of the dipole (1 each) and reflector (2 used) before proceeding further.

Three 5mm wide by 25mm long insulators were made using single-sided copper-clad board with a 5mm strip of copper removed centrally across the width (to form each insulator). Two insulators are used between the reflector and the dipole. Before assembly, two 75mm lengths of suitable heatshrink tube were threaded onto the wire, one per insulator. The 5A wire was stripped back and soldered onto each insulator, as shown

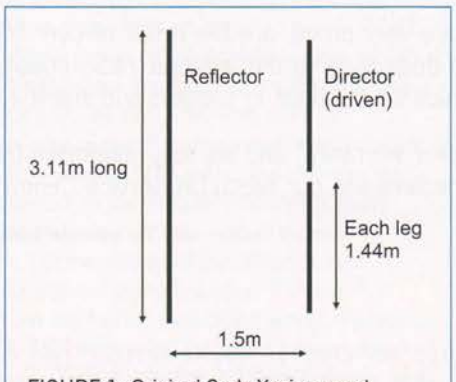

FIGURE 1: Original 2-ele Yagi concept.

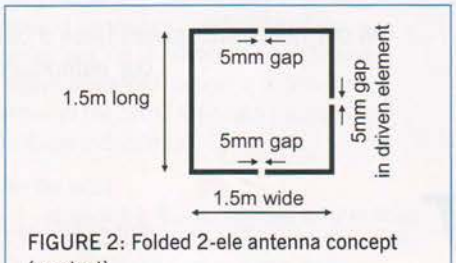

FIGURE 2: Folded 2-ele antenna concept (see text).

PHOTO 2: The antenna folds down to a compact size and shape for transport and storage.

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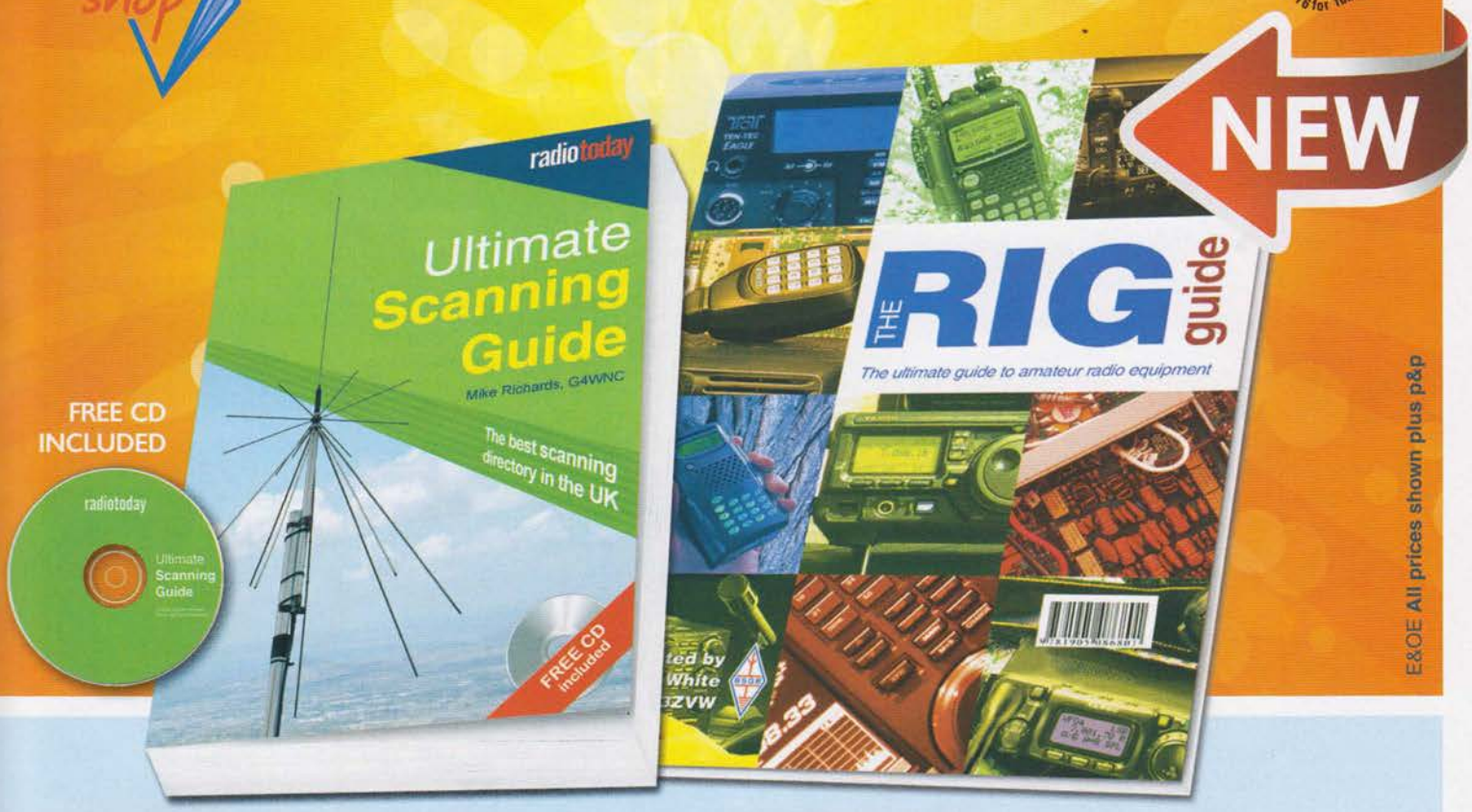

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PHOTO 3: Detail of the hinge assembly (see text).

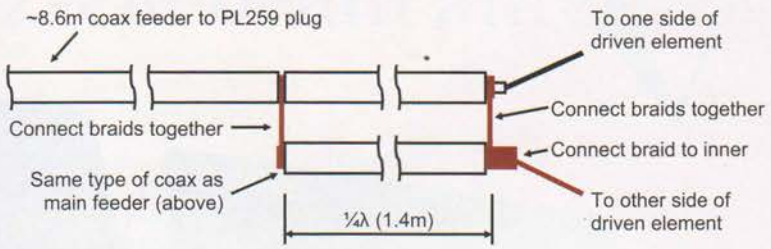

FIGURE 3: Connections between the feed coax and balun coax (not to scale).

in **Photo 5**. After soldering, the heatshrink was moved over the insulator and shrunk to provide waterproofing

The third insulator forms the centre for the dipole. The dipole insulator had two brass screw-connectors soldered on to allow the feeder to be attached (**Photo 6**). These brass connectors were obtained from a cut-up 'chocolate block' connector strip. A suitable plastic box with snap-on cover was used to protect the dipole's connections. Tight-fitting holes were drilled to allow cable access.

The beam antenna was then installed on the X former by pressing the 20mm plastic conduit connector pieces on to the ends of the conduit pipes. Once measured up for position, white marks were painted on the wire inside each conduit connector piece to show where the beam antenna needed to aligned for use. The total distance between the ends of each diagonal forming the X with the antenna attached then extended to 2.12m.

FEEDER AND BALUN. 10m of RG58U 50Ω coax cable was used as the feeder for the antenna, with a PL259 plug fitted at the radio end. A quarter wavelength balun was used to match the unbalanced feeder to the antenna's dipole. This was made up from the same RG58U cable. From experimentation, the length of the balun cable was found to be 1.4m, to allow for the cable's velocity factor at a test frequency of 50.150MHz. Arrangements for the balun are shown in **Figure 3**. The balun assembly was held together using lengths of insulation tape, spaced about 12cm apart. The connection between the coax outer shield and balun cables was soldered and then waterproofed using insulating tape.

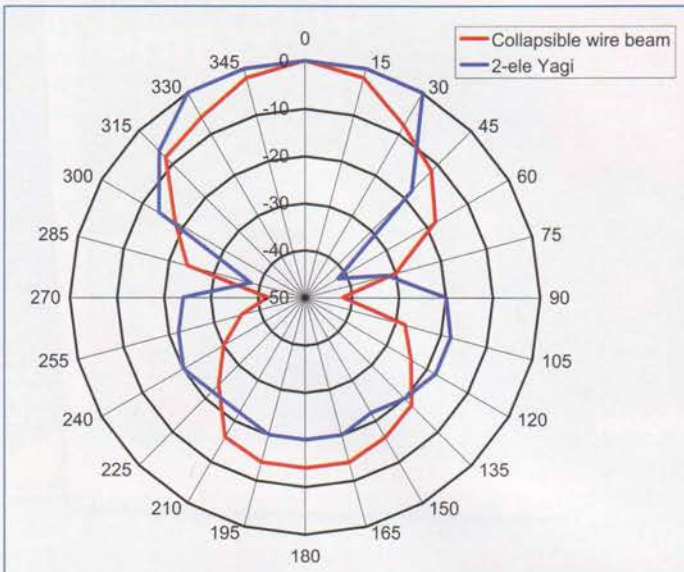

FIGURE 4: Polar patterns of the wire beam antenna compared with a commercial 2-ele Yagi. Scales are degrees and 0 to -50dB.

PERFORMANCE.

The antenna was found to give a VSWR of under 1.4:1 between 50.001 and 50.299MHz when mounted horizontally about 1.5m off the ground. Increasing the height to 4m improved the VSWR to better than 1.2:1 across the band. The tests were done at a power of 10W. To provide a safety margin for the antenna, it is suggested that a maximum power of 50W is not exceeded.

A horizontally polarised 50.210MHz signal source was set up at a distance of about 20m from the antenna, which was also horizontally polarised and mounted at 1.5m above the ground, on a tripod. With the antenna facing the signal source, the signal source power level was adjusted to read S9 on an Alinco DX-70 tuned to 50.210MHz in CW mode. The antenna was turned at 15° intervals to allow a series of S-point measurements to be taken. These were plotted, to provide an indication of the polar diagram for the antenna. This test indicated a front to back difference of about 14dB. A similar test was then repeated, using a commercial 2-ele Yagi and the results normalised on the same polar diagram, **Figure 4**. Performance is similar, although the 2-ele Yagi had a slightly better front to back ratio.

PHOTO 4: Attaching the antenna to a pole using a hose clamp.

PHOTO 5: Insulating spacers made from PCB material allow an accurate 5mm gap to be maintained.

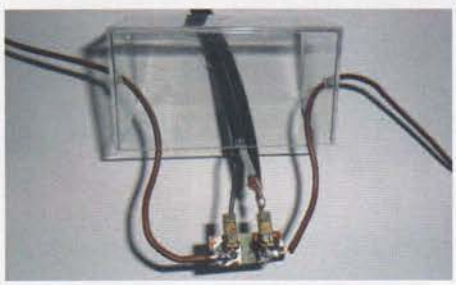

PHOTO 6: How the end of the feed and balun coax join the driven element. See also Figure 3.

ON THE AIR RESULTS. During the recent Sporadic-E season, the antenna was used to make SSB QSOs from my QTH in IO91 square with a SV9 station in Crete (KM25) and a 5B4 in Cyprus (KM64) with received signal reports of 5/9. Further to this, a UX1 station in the Ukraine (KN29) was worked on the key with a received signal report of 559. The power output used to work these stations was 10 watts. Compared to other stations worked and signal reports received using a 6m dipole, the 2 element collapsible wire beam has made an appreciable difference.

ACKNOWLEDGEMENTS: My wife, Karen: for proof reading the text. Nigel Ham, M0VVQ: for his many practical and helpful suggestions. Roy Emery, G3FYX: for suggesting other situations where the antenna could be useful.

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

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

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

Yaesu VR-160
Miniature communications receiver
£199.95

Yaesu FTM-350E

Dual-Band APRS Mobile FM with Latest firmware & FREE FGPS-1 GPS Module
Only £14.95p/m!
£46 deposit 36 x £14.95

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

Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/ mobile (100W)
Only £26.00p/m!
£80 deposit 36 x £26.00

or with AT-897Plus Auto ATU £924.95

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

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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Take a look at our brand new website!
www.HamRadio.co.uk

YAESU

ML&S

Officially Yaesu's largest dealer for over Ten Years! Quite a record and one that we are proud of. No other dealer comes close.

Martin founded his business buying and selling USED AMATEUR RADIO equipment? Twenty-one years later he's still buying UNWANTED EQUIPMENT at TOP PRICES!

Yaesu Rotators

ML&S always guarantee to have the largest stocks in the UK and, of course, the best prices. Cable extra.

G-450C Medium duty rotator - available today. **Only £339.95**

G-550 Elevation rotator for satellite operation	£329.95
G-5500 Heavy-Duty PC Controlled Vertical rotator for satellite and EME applications	£629.95
G-650C Medium duty with higher brake torque than the G-450	£379.95
G-1000DXC This new, high-performance rotator is ideal for heavy-duty applications. Its slim-line constructions is ideal for many crank-up tower installations. Rotation range: 450°, with presets.	£499.95
G-2800DXC Yaesu's top-of-the-line rotator is for extra-heavy-duty antenna installations. It includes Auto Slow Start and Auto Slow Stop features to avoid sharp jolts to the antenna array and tower. The G-2800A includes a mast clamp to simplify installation. Total rotation range: 450°, with presets.	£949.95

GS-065 Mast Bearing	£57.14	Rotator Cable 40m with plugs fitted	£123.95
GC-038 Lower Clamps	£34.95	Rotator Connector plugs	£25.95
Rotator Cable 25m with plugs fitted	£69.95		

G-550

Finance example: FT-950 at £1265.
Deposit of £126.50. 36 payments of £41.32. T.A.P. £1614.02. APR 19.9%.
Full written details available upon request. Offer subject to status. ML&S are a licensed credit broker.

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	1.5kW fully automatic ATU for QRO	£1399.95
AT-500	600W PEP Antenna Tuner	£399.95
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

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

Looking for the BEST Website for Ham Radio? Check out our COMPLETELY NEW site from the ground up for the latest deals and the easiest way to shop. www.HamRadio.co.uk

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ICOM

Full Icom range always in stock!

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

Icom IC-7410

100W HF+50MHz base station transceiver

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

RRP £1999
ML&S Only £1599.00
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 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

For those of you that check out our ML&S website, you would have probably read Adam Farson, VA7OJ/AB4OJ's Evaluation & Test report where comments like "Solidly constructed" and "Precise overall feel" contributed to a thumbs up review. Little wonder ML&S have found so many homes for Icom's HF & Six Metre radio. We have them available from stock and are of course offering high trade-in values for any HF rig, even ones with glowing round glass tubes in the PA!

Summer Sizzzzler!

IC-7000 + LDG IT-100

The sun has come out so what better way to enjoy an IC-7000 with the LDG IT-100 Auto ATU for **only £1129.95?**

Saving £400 off the RRP!
Whilst stock last.

Icom HF Products		Icom Receivers			
IC-718	£Call	IC-R9500	£Call!!	IC-E90	£239.95
IC-7200	£829.95	**Icom V/U Products**		IC-E90/4m	£299.95
IC-7000	£1189.95	ID-31E	£349.95	IC-E92ED	£388.95
IC-7410	£1599.00	IC-V80E	£105.00	IC-E2820	£485.95
IC-7600	£3279.95	IC-T70E	£158.25	IC-E2820 +UT-123	£699.95
IC-7800	£Call!	IC-E80D	£329.95	IC-910H	£1296.96
IC-PW1Euro	£4699.95	ID-E880E	£439.10	IC-910X	£1549.95

The Flex Store at ML&S

FlexRadio Systems

Pop in for a demo – coffee and an informative chat are free. Better still, give Sanderly our resident "FlexMan" a call today – he will guide you through each model and help you with your choice of components.

The word is finally out!
FLEX add the ULTIMATE SDR to their product range - The FLEX-6000 Signature Series - due end 2012.

Flex-6500
1.8-60MHz, 4 Slice RX SDR 100W Transceiver £3449.95

Flex-6700
1.8-60MHz, (+RX 135-165MHz) 8 Slice RX SDR 100W Transceiver £5799.95

Flex-6700R as above, Receiver only £4799.95

Deposits being taken now – call or see web.

Flex 1500 SDR Low cost SDR Transceiver, connect via USB & you have 5W 160-6m! £579.95

Flex 3000 with ATU 100 Watt SDR 160-6m with Auto ATU fitted £1399.95

Summer Special Prices on 5000 Series!

Flex 5000A Flagship 100W SDR Base 160-6m ..... ~~£2495.95~~ £2195.95

Flex 5000A-ATU Same as 5000A but built-in Auto ATU ..... ~~£2745.95~~ £2445.95

Flex 5000A-ATU+Twin RX as above but with second receiver ..... ~~£3434.95~~ £3134.95

ICOM IC-R2500

Reviewed in RadioUser August 2012

Dualwatch, Digital Mode, Diversity Receiver with Remote Head Included

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

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.

Solid State Amplifiers from RM!

RM ITALY

BLA-1000
1kW Key Down, HF Linear Amp with built-in 240V PSU.
Special offer £2479.95

HLA-300V Plus
300W Triple fan cooled HF 12V HF Linear Amp.
Only £399.95

HLA-300-Plus
300W Air cooled HF 12V linear Amp.
Only £369.95

HLA-150-Plus
150W (2-20W input) Air cooled HF Linear Amp.
Only £299.95

VLA-100V
100W (1-25W input) Fan cooled 144-148MHz Linear Amp.
Only £249.95

KL-145
100W (10-25W input) Air cooled 144-148MHz Linear Amp.
Only £149.95

VLA-150
100W Air cooled 50-52MHz Linear Amp.
Only £199.95

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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

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.

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-30SW1V **£89.95**

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**

~~£399.95~~ **Now £369.95** August/ September Only.

MyDEL MP-9626
120A, 13.8V DC power supply, switch mode.

Ideal for FT-817ND or most handhelds.

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

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

Perseus VLF-LF-HF Receiver

PERSEUS is a VLF-LF-HF receiver based on an outstanding direct sampling digital architecture Only **£699.95**

Perseus-FM+

High Performance FM 88-108MHz adapter for the Perseus SDR Receiver. Available late August. **£299.95**

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

DV-AP-Dongle The New DVAP allows you to walk away from your PC and remote control via your D-Star handie. **£219.95**
DV-Dongle A quick efficient way of gaining access to the D-Star network via your PC. **£179.95**

Software Defined Receiver

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

WiNRADiO Excalibur Pro. WR-G33DDC

The WiNRADiO WR-G33DDC 'EXCALIBUR Pro' is a high-performance, low-cost, direct-sampling, software-defined, shortwave receiver with a frequency range from 9 kHz to 49.995MHz. **£1599.95**

WiNRADiO

WiNRADiO WR-G31DDC EXCALIBUR **£699.95**

The SBS-3 is in stock NOW!

Now with full ACARS capability - Built-in!

ML&S are proud to introduce the Kinetic SBS-3, a unique and revolutionary product, built on the heritage of their SBS-1 range of receivers. We are an authorised retailer of this unique class-leading product and have sold more SBS-1's than any other retailer in the world.

ADS-B / AIS / Marine band / Air bands (VHF and UHF) Multi-Device - Multi-Band - Multi Channel Software Defined Radio Receiver / Decoder

Only £469.95 FREE WORLDWIDE SHIPPING see web

AirNav RadarBox & RadarBox-3D

RadarBox-3D Version. ML&S: £489.95

RadarBox-Pro Version. ML&S: £289.95 (Saving £110 off RRP)

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.

RF Concepts new product!

Alpha 4510 & 4520 Power Meters

For those of you that want the best in HF Linear Amplifiers, RF Concepts introduce the best in RF Watt meters. Two models, 3kW & 5kW, these two can offer total accuracy from 200mW right through to 5kW, 1.8-30MHz with no slugs!

For more information see our website.

mRS MiniVNA Series of Antenna Analysers

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

MiniVNA Original
PC Based Analyser
100kHz-180MHz
£249.95

MiniVNA Pro with Bluetooth
100kHz-200MHz
£339.95

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

KENT KEYS

From **£53.99**

Kent Hand Key **£71.74**

Tigertronics

Tigertronics SL-USB

ALL sound card Digital and voice modes are supported by the SignaLinkTM USB. This includes traditional modes such as RTTY, SSTV and CW (to name a few), as well as today's hottest new modes like PSK31, MT-63 and EchoLink.

From only £99.95

Call to discuss your rig-to-cable requirements.

RF Concepts Alpha Linear Amplifiers

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

"ASK THE HAM WHO OWNS ONE"™

Guaranteed minimum £500 trade-in for any HF Linear Amplifier against a new 8410*
*Offer limited to available stock.

Alpha 9500 Amplifier

The Alpha 9500 is no ordinary linear amplifier. The Alpha 9500 is the culmination of over 40 years of design and engineering. The Alpha 9500 is an advanced technology, auto tuning, linear amplifier that effortlessly delivers 1500 watts of power with as little as 45 watts of drive.

Key Features:

- Single, easy to find, inexpensive 3CX1500A7/8877 type tube
- Operates on all Amateur Radio Bands – 160m through 10m
- Comfortably delivers Full Legal Limit on All Bands
- No Duty Cycle Limitation – 100% carrier, key down
- Rugged construction – Built to last
- Quickly & Automatically tunes to match the input frequency and load.
- Remotely controllable – RS232 and USB port

Come and see one in store on demo today, £6299.95

It's the Ultimate Amplifier. Experience the magic of almost instantaneous band switching and tuning with the Alpha 9500. Send a few 'dits' and the 9500 quickly changes bands, tunes and loads, putting you right where you want to be, without flipping, twisting, and turning the knobs normally necessary on a manual tune amplifier.

Alpha 8410 Amplifier

Our long line of manual tune amplifiers demonstrates a 40-year commitment to building the best amplifiers in the world. The Alpha 8410 continues that commitment as the rugged, forgiving, manual tune amplifier today.

Key Features:

- Twin 4CX1000A Tetrodes in parallel for a maximum plate dissipation of 2KW.
- Operates on all Amateur Radio Bands – 160m through 10m
- Comfortably delivers Full Legal Limit on All bands and in All modes
- Uses our time proven Hypersil 3.5KVA transformer.
- No Duty Cycle Limitation – 100% Carrier, Key Down
- Rugged Construction – Built to Last

In stock now, £4495.95

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.

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-62M1.6-56/140-470MHz 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

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

Hustler Antennas
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

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

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

Wonder-TCP
40-10m Tuneable Counterpoise..... £59.95

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

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
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YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£177.65
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75th Commonwealth Contest 2012

ZF1UM antennas at the Cayman ARC station.

STORMS. The 75th contest will be known for storms. Storms in the ionosphere, storms in the atmosphere and yet, despite all that, some outstanding performances by the leading operators.

A major Coronal Mass Ejection (CME) with the A index hitting 85 caused a complete loss of HF propagation for 2 hours and generally poor conditions. The southern hemisphere entrants appear to have been especially badly affected. Elsewhere, gales in Bermuda and high winds with heavy rain in Malta caused antennas to fall down and noisy band conditions in general.

Despite that, the number of entrants bounced back to the level of a couple of years ago. Larger numbers of UK entrants, some being first timers in the Commonwealth Contest, made up the numbers. The prize draw for the SDR-IQ seems to have stimulated quite a few to have a go and enter.

For this, the 75th contest, DX travellers made DXpeditions to C5, ZL7, ZD7, ZF, J7, J8, VP9, 6Y and 9H, greatly increasing the level of interest for all.

OPEN SECTION. Martin, G4XUM, travelled to Grand Cayman and operated as ZF1UM to take the Senior Rose Bowl at his first attempt. Martin used the club station of the Cayman Amateur Radio Club. He amassed 1012 QSOs and, crucially, 261 bonuses. Martin said, "First time in the Commonwealth Contest for me and very pleased with the outcome – guess I'm hooked. Apart from a couple of hours solar blackout on Saturday, everything went well. I had a few antenna issues that compromised me at times. Thanks to the Cayman Amateur Radio Society for letting me operate, and a big thanks to those who QSYed when asked. Last but not least thanks to Mike, G7VJR, for the loan of the solid state amp."

Second was John, VE3EJ, with 9350 from 894 QSOs and 244 bonuses.

In third place was Nigel, ZD7XF, who managed a score of 9040 from 1104 QSOs but 176 bonuses. Nigel operated for nearly the whole time (23 hours) with just two short 20 minute snoozes. At 15° south in the Atlantic, St Helena is a bit far from the two main areas of activity (UK and VE) and particularly from western VE. However, the excellent north-south path into the UK pushed the QSO total on 10m to over 350 QSOs. But, down on 80m it was a struggle to be heard much of the time except for a fine opening to the UK at just before sunrise (0625UTC) on St Helena. Once again there were many UK stations worked who seem only to make an annual appearance on the bands during the Commonwealth Contest. Working these stations is all part of the fun of the contest!

In 4th place was Dave, J88DR, with a score of 8700 from 852 QSOs. Dave's linear was eaten and wrecked by termites, so the station this year ran just 100 watts to the HF beam and LF dipoles.

In 7th place and winner of the Col. Thomas Rose Bowl for the leading UK station, is Justin, G4TSH, with a score of 7845 from 397 QSOs, operating the G0KPW contest station. Justin said, "A very enjoyable event, despite all the gloomy forecasts. Conditions to Canada were very poor, made up for to a certain extent by some good openings on 10m elsewhere."

Next highest UK station was Gavin, GM0GAV, with 7115 from 351 QSOs, closely followed by Don, G3BJ, with 7080 from 360 QSOs. Don commented, "Great contest again hampered a little by the A index! Seemed good activity, plus a bundle of travellers made it good fun."

Leading VK station was Kevin, VK6LW. Kevin reported, "Solar activity made conditions quite unpredictable, it appears some other areas were more affected than VK6. A good opening at the end on 10m to G with some excellent signals."

The highest ZL station was ZL3IO, in 29th place, being badly affected by the poor solar conditions.

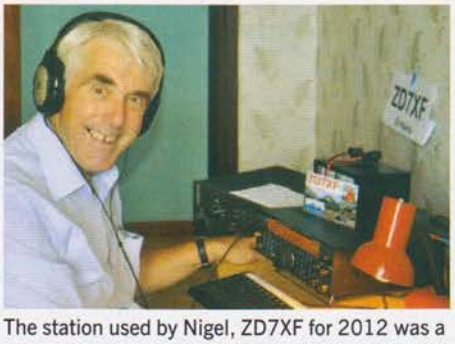
RESTRICTED SECTION. The Restricted Section remains extremely popular. All of the top five places were taken by DX travellers: 9H3ET, 9H3C, C56XA, G3MXJ and J79SZ.

The leading station was Peter, 9H3ET (G3LET), who mounted a field day style operation from the north western tip of Gozo. Peter's score was truly outstanding, 9690 from 1070 QSOs and 217 bonuses to take the Junior Rose Bowl. There was nothing junior about this performance, a record score for a Restricted station. Peter's trip, made overland from the UK, was a triumph of logistics but not without some weather problems. Peter said, "The contest morning dawned grey, wet, blowing and with passing thunderstorms. It soon became apparent that the 18m Spiderpole supporting the 80m GP had ceased to exist at some point during the night, having broken into three pieces and taken with it the 10/15/20/40m dipole that I had rigged between it and another 18m, which hosted an elevated 40m GP. The guy support sleeve on this second mast had slipped down by several feet, leaving it in a most precarious attitude. A third 12m mast, which carried a 3-band 20/15/10m GP was more or less intact, although all the guys had stretched a fair amount. At this point, some of my wife's less optimistic predictions for the trip seemed likely to come to pass and my mind turned to the earlier thought processes that led us to embark on it."

With 6275 from 723 QSOs and in second place was the other Gozo station, Peter, 9H3C. "I used the fan dipole system I took to VP2V in 2011 and it worked very well. I could not find enough multipliers to make my 733 QSOs into a bigger score than I got with around 600 Qs last year."

In third place was Alan, C56XA who had a special African type of problem, "Here is my entry for the best excuse section of the contest. A herd of the Gambian President's cows ran into my HF vertical one hour into the contest, smashing it to bits. I continued with just my LF inverted-L and ATU but it made for slow band changes. My apologies to those who tried to move me between bands."

And in fourth place, welcome back to Dennis, G3MXJ, who made his own trip back from France for the contest and, in doing so, takes the John Dunnington Trophy by being the highest placed UK



The station used by Nigel, ZD7XF for 2012 was a Kenwood TS-590S and a small Tokyo High Power HL-550FX amplifer.

station who has not won the trophy for the past two years. Dennis operated from the home of Maud Slater (XYL of Al, G3FXB), to activate his old location once again, from which Al had entered virtually every year since the 1950s.

ZL1AMO (RON) MEMORIAL STATION. As a memorial for a famous DXpeditioner and superb operator, NZART (with the family's approval) authorised the use of ZL1AMO by the NZART HQ station during the Commonwealth contest.

HQ STATIONS AND MULTI-OPERATOR. GB75CC, special callsign for the 75th Commonwealth Contest, was operated this year by Chris, GM3WOJ and Vic, G4BYG from the GM2V contest station near Inverness. GB75CC leads the four HQ Stations that were active, GB75CC, ZL1AMO, VE7RAC and VA3RAC.

Eighteen stations entered the Multi-operator section, which was won by VO1HP (5715 from 695 QSOs). At the moment we don't have any trophies for this section but we would like to have one for next year. Can someone oblige?

12 HOUR SECTION. The award for the highest placed non-UK station who operated for 12 hours, the VP8GQ award, goes to Allen, N2KW, who operated from the 6Y0A station of 6Y5WJ. Allen said, "It happens every year, in mid-March, I would turn on the radio, and hear everyone having fun in something called the Commonwealth Contest, but couldn't join in, because my location is a few hundred kilometres too far south. I have watched this enough times to pique my interest. What would it be like to actually compete in the Commonwealth Contest?" Well now you know, Allen!

The Ross Carey Rose Bowl goes to Ian, G3KZR, as the highest placed UK station who operated for 12 hours.

COMMONWEALTH TRAVELLER AWARDS. Some ten entrants travelled to Commonwealth countries especially for the contest or were on DXpeditions at the time. This year the first award is made to Nigel, ZD7XF, having the highest score for a call area not active in 2011. A second special award for travelling to an 'inaccessible' call area goes to Dave, ZL7/VO1AU. Dave said, "I was so excited to be able to activate Chatham Island for the Commonwealth Contest but excitement turned to frustration with the poor propagation. I had many long periods when I could hear no signals – a complete ionospheric blackout, or periods when I could hear only one station that I had already worked. This was a hard year to go 'restricted' from a very remote spot. Perhaps I can console myself with the ZL7 record and be pleased that I have now visited this beautiful island."

QRP CERTIFICATE. The certificate for the leading QRP entrant goes to Dave, G3YMC.

COMMONWEALTH MEDAL. The Commonwealth Medal is awarded to Lee, VE7CC. Lee first appeared in the Commonwealth Contest top ten placings in 1975 and then went on to achieve his first win of seven in 1976. He last won in 1988 and has been a consistent entrant since. So thanks to you Lee, for the 37 plus years of entries and all the bonuses.

The ground in front of the antennas at the Two Gun Saddle QTH on ZD7 fell away rapidly, affording a good take-off to towards the north.

COMMONWEALTH TEAM CONTEST. This year, team sizes were reduced to five entrants and multiple teams from call areas were encouraged.

Team Caribbean/Atlantic: 6Y0A, J88DR, VP9/G3PJT, ZD7XF, ZF1UM	48621
Team Australia: VK2BJ, VK2PN, VK3TDX, VK4EMM, VK6LW	47551
Team New Zealand: ZL2BR, ZL3IO, ZL3TE, ZL7/VO1AU, ZM4G	35110
Team Canada Eh?: VE3EJ, VE3FU, VE3KI, VE7CC, XL3T	35030
Team Mediterranean & West Africa: 9H3C, 9H3ET, C4Z, C56XA, ZB2EO	34030
Team Scotland: GM0GAV, GM0NAI, GM3POI, GM3SEK, GM3WUX	29105
Team UK Christmas Islanders: G0KPW, G3RWL, G3WPH, G3YBY, G6PZ	24135
Team MCC Canada: VE1AL, VE1OP, VE1ZJ, VE9HF, VE9ML	21890
Team Thames Valley: G0OPB, G0ORH, G3VPW, G3XTT, M0DHO	21145
Team Essex CW ARC: G0DVJ, G0IBN, G3BJ, G3GLL, G3YEC	15745
Team Canada 'B': VA3DX, VE3ZI, VO1HP	12740
Team ZL3 Earthquake Survivors: ZL3AB, ZL3GA, ZL3NB, ZL3DMC, ZL3PAH	11375
Team S'Toon: VA5LF, VE5UO, VE5VA, VE5ZX	1935

And, finally, the Team ZL3 Earthquake Survivors team operated in the dress of their national origins. You can see the pictures on the website.

ADJUDICATION. Almost all the logs received were submitted via the Robot this year. There were a few minor problems with formatting and interpretation of the Robot's responses, but nothing insurmountable. Hand-written

Vic, G4BYG, operator of GB75CC.

SOAPBOX SELECTION

9M6XRO: Condx fair despite a lot of 'space weather' around. 10m was open from time to time. Thanks again to the organisers 73 to all from Borneo and of course HAPPY 75th!

G0ORH: Managed to get a team up together and had lots of fun. Great show organisers and the team. We entered, we adapted, we persevered and we enjoyed! Ken, G0ORH Capt - Team Thames Valley.

G3RWF: HF bands closed early but good to hear VK and ZL busy. Sorry wasn't able to put 5X1NH on the air this time.

G3TQZ: This is my first entry in Commonwealth Contest and my first contest entry for over 40 years.

GM4WZG: David, GM3VYJ and Bernie, GM4WZG got together for a multi-op effort. Tough going last year. Seemed to be tough going this year too! Lots of nice Commonwealth DX.

VE1ZJ: Great contest. Other years 12 or 13 countries worked. This year 25 worked.

VE5ZX: The propagation gods struck VE5-land with a mighty force again.

VK3MI (ZL1AZE): Nice to be back in this contest after missing the 2011 event while we were moving QTH from ZL to VK3.

ZL2BR: The solar flare certainly spoiled the party in a big way, with polar and near-polar propagation paths being severely affected. UK stations with directional antennas should, please beam south or north to work the majority of ZL's and beam west or east to work the majority of VK's!

logs are always welcome but should be submitted as a sequential list of QSOs.

The usual penalties were applied for carelessness in copying callsigns (there were a few real howlers), reports or serial numbers. Sloppy sending by hand, misuse of logging software, including some of the most popular programs, can also lead to serial numbers not being correctly logged at the transmitting end. This is not easy to detect at the adjudication stage, but a number of cases were established beyond doubt and were suitably penalised. In a number of other cases, the sending station was strongly suspected to be in error but it could not be proved – on these occasions neither station was penalised.

A small number of stations submitting single-operator entries were found to have been actively using the cluster while making contest QSOs – almost all were re-classified in the multi-op/assisted category. The rules for 2013 will be changed to exclude any involvement with the cluster for single-operator stations. Comments and/or queries about the adjudication may be addressed to commonwealth.contest@rsgbcc.org or to secretary@rsgbcc.org.

ACTIVE CALL AREAS (59). A3, 4S, 5B, 5H, 5N, 6Y, 7P, 7Q, 9H, 9J, 9M2, 9M6, 9V, 9Y, C5, C6, G, J3, J6, J7, J8, V3, V5, V8, VE1, VE2, VE3, VE4, VE5, VE6, VE7, VE9, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VO1, VO2, VP2, VP8, VP9, VY2, VU, Z2, ZB2, ZD7, ZF, ZL1, ZL2, ZL3, ZL4, ZL7, ZS1, ZS2, ZS5 and ZS6.

PRIZE DRAW. The prize draw for all entrants with 75 or more valid QSOs will take place at the RSGB Convention, October 2012. Many thanks to Martin Lynch & Sons for sponsoring the special prize draw.

76TH COMMONWEALTH CONTEST 2013. The 76th Commonwealth Contest will take place on 9 and 10 March 2013. More details later. Why not make plans for a DXpedition?

ACKNOWLEDGEMENTS. Thanks to Paul, EI5DI, for SDC and sponsoring the Team prizes. Thanks to Peter, G3LET for umpiring the Team Contest and to Steve, G3UFY for adjudication and to all of the entrants and active Commonwealth stations for their support.

WEBSEARCH

Full results: www.rsgbcc.org/cgi-bin/hfresults.pl?Contest=Commonwealth%20Contest&year=2012

Commonwealth Contest: www.beru.org.uk

ZD7XF: www.g3txf.com/dxtrip/ZD7-Mar-12/BERU-12.html

9H3ET antennas at the start of the contest. Should have doubled up on the manufacturer's guying!

6Y0A: www.beru.org.uk/2012%206Y0A/6Y0A.html

ZL7/VO1AU: www.beru.org.uk/2012%20ZL7VO1AU/ZL7VO1AU.html

9H3ET: www.beru.org.uk/2012%209H3ET/9H3ET.html

9H3C: www.beru.org.uk/2012%209H3C/9H3C.html

VP9/G3PJT: www.beru.org.uk/2012%20VP9G3PJT/VP9G3PJT.html

HF

What's been happening on the bands and more on what to expect

G3TXF and SM0T check out SM5AQD's 80m Yagi, down for maintenance.

WHO WAS ON THE AIR. Band conditions were nothing to write home about during July, but there were a few nice operations to liven things up. CY9M (St Paul Island), for example, which has just wrapped up as I write this, made over 33,000 contacts and worked the UK on all bands. And many UK stations are busy enjoying using the Olympics special prefix. But by the time you read these words we will be approaching September and the start of the main season for DX and contest activity. In particular, we have Swains Island and Conway Reef to look forward to (see later) and can only hope that autumn sees an upturn in solar activity, similar to what we experienced last autumn. If not, these could be very tough from the UK. In the meantime, some of you may have caught 9M4SLL from Layang Layang (Spratly Islands), operated by John, 9M6XRO and Steve, 9M6DXX (past *RadCom* editor), who were due to be there from 7 to 13 August, having obtained operating permission at fairly short notice. Steve notes, incidentally, that the 9M4 prefix is issued to special event stations that may be anywhere on Malaysian territory; this includes the DXCC entities of West Malaysia, East Malaysia or, as in this case, Malaysian islands in the Spratly group.

For my own part, I enjoyed a short trip to Market Reef as OJ0R in company with G3TXF, SM0T and SM0W. It was fascinating to compare propagation from that northerly location (it is located between Sweden and Finland) to that from the UK. Japan seemed to be much easier to work on all bands and those European stations that we struggle with on the high bands because they are too close (Netherlands, France, Belgium, etc) are loud, just as Italy is in the UK. In contrast, at least while we were there, the path to the Caribbean and North America was more challenging than from home. The problem the Scandinavians face, of course, is that when a solar storm hits they are right in the thick of any auroral activity with the result that, despite the big antennas that many of them enjoy, the bands can suddenly be very dead indeed.

DX NEWS. A 20-man international team will sign NH8S from Swains Island from 4 through 17 September. Swains is number 31 on the *DX Magazine* Most Wanted Survey and number 30 on *ClubLog*'s Most Wanted list. They will operate all bands with SSB, CW and RTTY. QSLing will be handled by Joe, AA4NN, with help from his XYL Margarett. Plans are to upload logs daily by satellite phone from the island to *ClubLog*. There will be a great emphasis placed in working Europe where Swains is most needed. Full details appear on the expedition website. Swains is a privately owned island and the only way to get there is from American Samoa via ship. The time frame of this operation may not be the best for the low bands, but dates are dictated by transport and weather. The team of international operators will first gather in Honolulu and then travel together to American Samoa. Landing permission has been granted for the tent and generator operation by the owner for this timeframe.

The World-Wide DX Group, led by Hrane Milosevic, YT1AD, will operate as 3D2C from the remote South-Pacific atoll of Conway Reef. This DXpedition will take place from 24 September to 5 October. The team is the same one that operated as 3D2C from Rotuma Island last September. They plan to target European contacts during those periods when propagation is possible and will ask Japan and North America to stand buy during those brief periods when the bands are open to Europe. QSL Manager is YT1AD. They will have OQRS (online QSL request), and will accept direct and bureau QSL cards. They plan to upload the logs to *ClubLog* on a daily basis. More information on the website.

Manos, SV1IW, President of the RAAG, Radio Amateur Association of Greece, says that SY callsigns will be appearing on the HF bands. They are not Mt Athos but "Greek entry-level stations. These are 10-watt stations with limited bands and up to 3dBi gain antennas". In fact, despite what many logging programs continue to insist, SY has rarely been used from Mt Athos and the only resident amateur, Monk Apollo, continues to use the callsign SV2ASP/A.

KY6R has started what he calls 'the DXCC Sleuth Blog'. Rich wants more 'DXCC stories from the past' or 'folklore associated with DXCC entities past and present'. He says the first article describes his "intention in detail and basically my motivation is to simply share the rich history that makes the DXCC program worth pursuing. I couldn't see anyone writing a book – but a blog seems like the way to go."

My good friend Chris Burger, ZS6EZ, references an excellent document on birds and amateur radio antennas and towers that he prepared for an earlier expedition to Marion Island (ZS8). In the light of the recent situation on Sable Island (see last month's column regarding VE1AWW) it is worth a read.

NORTH KOREA. Rick, K6VVA has issued a couple of press releases about plans he has been working on for a small operation from North Korea, perhaps leading to something more substantial. I wouldn't hold your breath on this one, but a look at his website to see what he is proposing may well be of interest.

DXCC NEWS. Fred, G4BWP (A65BD) asks me to pass on some changes to DXCC field checking in the UK. There is full information on the RSGB website under the Spectrum Forum pages (the easiest way to find this is to use the search box and enter DXCC Field Checking) but the headlines are as follows. Firstly, G0KRL has retired as the G postal checker after 12 years. Fred says, "A huge vote of thanks is owed to Ian for his sterling service". Ian remains on the field checkers list for any local customers. His role is taken by Lionel, G5LP. There is no change for the other UK areas; GM3YTS is still the postal checker. The 'big' news is that 160m contacts and deleted entities may now be Field checked. For the 160m cards the checker must be on

the 160m DXCC list. (G5LP, G4BWP, GM3YTS are 'qualified' to check 160m cards). ARRL DXCC has introduced an online application form and its use is requested by anyone who has access to it as it solves many problems (handwriting, payments) and reduces DXCC workload as the application can be transferred to the DXCC system without re-typing by them. It is hoped that some tutorials can be given on this, and LoTW, at the RSGB HF Convention in October as well as the usual card checking.

DXPEDITION FUNDING. DXpedition funding is a topic I haven't often tackled in these pages, although I have covered it more extensively in my column in the CDXC (Chiltern DX Club) magazine that I have been writing for some years. The subject has been brought to the fore recently by N1DG and others following the VP8ORK (South Orkney) expedition, which proved very costly (as, indeed, does any operation that requires hiring a substantial ship over an extended period). Many of the so-called expeditions to be heard on the bands on a daily basis are little more than 'holiday' operations; one or two people taking a radio or two by air and making maybe 10,000 or so contacts. Lots of fun for them and for us, but not exactly onerous or expensive. At the other extreme are those operations such as Swains Island, featured this month, where equipment is shipped beforehand by sea container, and the team also need to charter a boat from the last point reachable by air (in their case American Samoa). The cost of such a DXpedition can run to hundreds of thousands of dollars. While I was in Norway earlier this year, there was a discussion by the Norwegian amateurs of a possible expedition to Bouvet Island (3Y) in the southern ocean, but such a trip would be well beyond the means of Norwegian amateurs and would require substantial help from elsewhere.

Where does the money come from? Typically, the operators themselves make a significant contribution. I know of expeditions of the more challenging sort that require the operators to pay maybe $10,000 or more and that's on top of any airfare they have to find to get to the ship's point of departure. But even this only goes part-way to covering the total costs. The rest usually comes from a multitude of sources including DXpedition funds (the RSGB, CDXC and GMDX in the UK administer such funds, financed from voluntary contributions in the case of the former and member subscriptions in the case of the latter two, but these are all quite modest compared with the Northern California DX Foundation that is the largest such funding body) and sponsorship of various kinds (clubs, individuals, maybe commercial bodies). Then there is income from QSLing. Many amateurs will include an extra IRC or dollar bill to help defray expedition costs, although the impact is limited (I have seen plenty of cases where an amateur will include, say, $1 for postage, even though he is expecting confirmation of multiple contacts). In recent years, though, the dynamic has changed. Many DX chasers are interested only in DXCC credit and are prepared to wait for an expedition to upload its log to Logbook of the World (LoTW), rather than claim a QSL card. The good news, though, is that many expeditions are offering an online QSL request and/or donation service, usually using Paypal as the payment medium. This allows DXers to request a card without the expense of sending one (which the expedition probably isn't interested in having in any case) or simply to make a donation if no physical QSL card is required.

Some of the hardware at the SK0UX contest site (active as SK9HQ in the July IARU contest).

The above is very much a simplification of what has become a complex and often emotive topic. There are those who object, quite rightly, to 'holiday style' expeditions asking for financial help. Others simply don't see any need to help out with any sort of expedition on the basis of 'if they want to go there, that's up to them'. But without financial support, many of these larger and more extreme operations simply would not take place. As it is, many take substantial financial risks; usually the major costs come early on (boat charter, commitments to accommodation, etc) while donations and/or QSL income may or may not come in after the expedition is over (always assuming the expedition doesn't encounter problems along the way, preventing it from happening or severely limiting its activities – I have reported on several such instances in recent months).

It will be interesting to see whether and how the issue of financing resolves itself in future years. It has always been with us – the YASME Foundation, for example, was founded many years ago specifically to raise funds for a couple of itinerant DXpeditioners who could be relied upon to activate some rare ones. Many other sports and hobbies enjoy a much more structured approach to financing. We in amateur radio have a somewhat more ad hoc system which is both good and bad. But those of us who enjoy DX rely on it to continue to work by some manner or means.

CORRESPONDENCE. We're a bit thin on correspondence this month, probably due to holidays and the poor band conditions. As a result, I have held over the annual table until next month, as there were so few updates. Peter, G(O)4XEX uses the word 'dire' to describe the bands, although he did manage HI8MU, YV4BCD, YV5OF, YV5MM and JR6WM on 20m datamodes, BOOM, BD5FFK and BD4W on 20 SSB and C37NL on 17 SSB. Dave M0BVE, meanwhile, mentions TT8PK on 17 and 5T0JL on 20, both CW.

SILENT KEYS. I was sorry to hear recently of the passing of Morton L Bardfield (Mort), W1UQ (PJ7UQ/PJ8UQ, FS5UQ, VP2EUQ, ex W1QHC), just days before his 82nd birthday. Mort was first licensed at the age of 16 as W1QHC. He was a communications expert and real estate developer. Mort was the founder and CEO of East Caribbean Cellular, Comm-Systems Ltd. His English wife Claire is also licensed as K1YL, as well as PJ7YL, PJ8YL, FS5YL, G3YL and VP2EYL. Mort's interesting life is chronicled on the W1UQ website. He and Claire were kind enough to host me on a visit to Boston in 1982, when I was able to operate from their well equipped apartment block QTH (they lived on the top floor and had monoband antennas on the roof). It was also my first opportunity to operate a Kenwood TS-930 which, at that time, was the 'must have' HF transceiver.

Also, Paul Caboche, 3B8AD (ex VQ8AS, VQ8AD, 3B1AD), passed away in July. He was 94 and Mauritius Island's oldest amateur. Paul was first licensed in 1937 as VQ8AS, later receiving the call VQ8AD in 1970 and then eventually being assigned the call 3D8AD. He was the first chairman of the Mauritius Amateur Radio Society (MARS), between 1967 and 1993. "He has done much to protect the interests of ham radio in Mauritius and to promote this hobby over the years", recalls Jacky, 3B8CF.

WEBSEARCH

3D2C: www.yt1ad.info/3d2c/index.html
K6VVA: www.k6vva.com/p5/
KY6R Blog: http://dxccsleuth.wordpress.com
NH8S: www.nh8s.org
W1UQ: www.w1uq.com
ZS6EZ article on birds:
http://zs6ez.org.za/download/zs8-ant.pdf

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- Record functions: MIC record, line-in record
- Instant Record from radio feature (able to record while playing)
- Sleep timer and alarm clock functions
- Multiple language selection (14 plus languages)
- Built-in flash memory (4GB)
- Built-in micro-SD card reader (supports up to 16GB)
- Upgradeable firmware
- Ports: headphones output, Line-In, Mic, Mini USB 2.0 jack (high speed)
- Built in Internal battery pack (charges through USB port)
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- Weight: 9.6 oz. (272 g)

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AM/FM-Stereo/Shortwave Aircraft Band Radio with SSB (Single Side Band)

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- Single Side Band (SSB) mode
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- Auto Tuning Storage function (ATS) for FM/AM
- 1000 station memories
- 2 stage attenuator
- Wide/Narrow filters
- Dual alarm clock function
- MP3 - Aux input
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- Antennas - switchable internal/external
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Covers MW/SW/FM Bands Features Large 5" Full Range Speaker for Exceptional Sound Quality

- AM (530-1710 kHz)
- FM (88-108 MHz)
- SW (1711-29999kHz)
- MW (520-1620 kHz)
- MW/SW IF Wide/Narrow Bandwidth selection
- 9/10KHz MW steps select-able
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G3 Globe Traveler

AM/FM/Shortwave Radio with Aircraft Band, SSB, RDS, and Synchronous Detector

- Shortwave: 150-30000 kHz
- VHF Airband: 118-137 MHz
- Long Wave Band: 150 - 522kHz
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- Clock, sleep timer, alarm function
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- Size: 168 x105 x28 mm (WHD)
- Weight: 345 g

£99.95

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Long wave: 153 - 513kHz
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SW: 2.300 - 21.950MHz
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Alarm, Clock, & Snooze functions
200 Memory storage

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VHF/UHF

A disappointing month for Sporadic-E propagation but some excellent auroral and tropospheric events

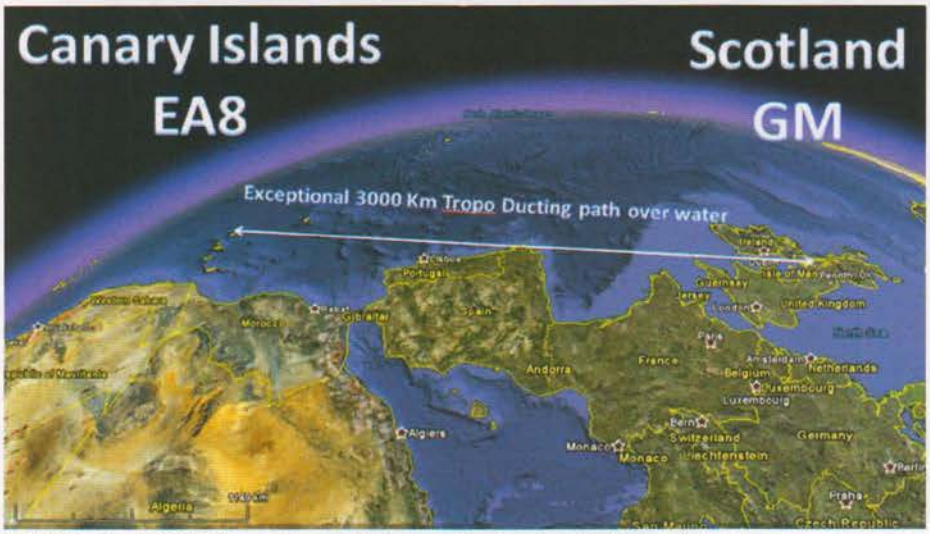


PHOTO 1: The 3,000 kilometre tropo path between Scotland and the Canary Islands.

PROPAGATION EVENTS. Although there were a number of Sporadic-E (Es) openings on the 50, 70 and 144MHz bands during July, the quality and duration of most openings was very disappointing. A few transatlantic openings were reported on the 50MHz band during the period but, with one exception, all were very brief events. However auroral backscatter openings were noted to be on the increase, with one excellent event that lasted for over 12 hours, providing DX contacts on all the VHF bands. Auroral-Es forward scatter openings on the 50MHz band were also recorded on a number of occasions, with contacts being made into Scandinavia and further into the Arctic region. Tropospheric openings were particularly good over the 3,000km marine path to the Canary Islands, Africa, with contacts being made from the UK on both the 144 and 432MHz bands.

CQ AURORA! In my opinion one of the most exciting forms of VHF propagation is auroral back-scattering. In the northern hemisphere it is referred to as the 'Northern Lights' or aurora borealis and in the southern hemisphere they are the 'Southern Lights' or aurora australis and, when the doughnut-shaped areas surrounding the Earth's magnetic poles become ionised, they are able to scatter back signals in the VHF and UHF region.

The ionisation has its beginnings in something called a coronal mass ejection (CME). As this ejection rises off the surface of the Sun it draws out magnetically opposed field loops, which subsequently reconnect and produce a solar flare. But the flare is a secondary effect that, compared to the CME and the tremendous shock wave it propagates into the solar wind, is of little consequence. The output of the solar flare covers only a narrow cone angle, whereas the output of a CME can cover up to half of interplanetary space. This solar material is made up of charged particles (ionised hydrogen, electrons, protons) and is carried towards Earth via the solar wind before becoming trapped in the Earth's magneto-tail. An increase in this particle flux by a mass ejection or, to a lesser extent, by a coronal hole, stretches the magneto-tail until it snaps and reconnects. When this happens, some of the trapped particles are propelled towards the Earth by the contracting magnetic field lines, leading ultimately to an auroral event.

As I mentioned earlier the auroral activity is centred in a doughnut shaped region surrounding the magnetic poles. These zones are termed the auroral ovals and are normally located around 65-70° of geomagnetic latitude. To make contacts via the aurora you need to beam at the auroral oval itself. So regardless of your station location, always beam in a generally northwards direction when auroral activity is suspected. This assumes that you have a directive antenna such as a Yagi or similar type of beam array. If you don't, then you simply will not experience the magic of auroral openings. When signals are heard, swing the beam either side of north to maximise the signals. However, signals propagated via the auroral curtain will always be badly distorted, as this is caused by a random Doppler shift imparted to the signal by the wave-like motion of the aurora. This produces a characteristic hissing sound, making voice signals very difficult to copy. Morse, on the other hand, is easier to copy, with the signals sounding like keyed white noise. Because of these characteristics it is essential that auroral back-scatter contacts be attempted using CW or SSB modes.

Why do I like auroral propagation so much? First and foremost it is because it enables me to make many DX contacts on the VHF bands and with a mode, CW, that I really enjoy using. It is similar to Sporadic-E propagation insofar that contacts up to 2,000km away can be achieved. But that is where the similarity ends. It is very rare for Es propagation, at the 144MHz band, to occur on path lengths shorter than 1,000km or so. With auroral contacts it is possible during very strong events to work stations in the same locator square with fully auroral signals. Propagation during Es openings is also very geographically selective. A station just 10km away from you may be having fantastic opening but you may not hear anything at your QTH. Auroral openings on the other hand generally favour everyone (less so the further south you are located) and you do have some control over the specific areas you wish to contact. Generally speaking stations in central England need to beam due north to contact stations in Scotland and northern England. Moving the beam eastwards, say to 20° or so will bring in the Scandinavian stations and 40° might bring you the eastern European stations in the Czech Republic, Slovakia Poland or Hungary. Obviously each and every auroral opening is completely different, but you do need to be aware of the need to keep moving the beam around to optimise signals strengths for stations in particular regions. Whenever I participate in an opening I always ascertain where the Scottish stations peak up with the greatest signal strength and I then move the antenna 30° more to the east and start listening for DX stations further afield.

Forecasters say that Solar Maximum is due in the year 2013 and, when it arrives, the peak of 11-year sunspot cycle will bring more solar flares, more coronal mass ejections, more geomagnetic storms and more auroras than we have experienced in quite some time. And, on Sunday 15 July, we got a taste of things to come after a giant sunspot that had erupted days earlier, producing an X-class solar flare that hurled a billion tons of electrified plasma towards the Earth. When the CME first arrived on 14 July, its effect appeared

weak. However, conditions in the wake of the CME then became very stormy as the impact sharply compressed Earth's magnetosphere.

The auroral back-scatter opening was first detected by stations in Scotland around 0820UTC on the 15th, but this event faded out fairly quickly by 0900UTC. The main event however commenced at 1200UTC and continued through to around 0100UTC on the following morning, with DX contacts being made on the 6, 4 and 2m bands.

On the 6m band most contacts appeared to be inter-UK, although some better equipped stations did manage to work further afield. Contacts via auroral propagation are always better on 6m when you have a big antenna! Amongst the 6m DX reported were the stations of HB9Q (Switzerland), LA8AJA (Norway), OE5MPL (Austria), OZ1DJJ (Denmark), SM0KAK (Sweden), SP1MVG (Poland), S57RR (Slovenia) and TF3ML (Iceland).

Jamie Ashford, GW7SMV (Gwent, IO81) made a number of SSB contacts on the 6m band that included the stations of GM4PMK (IO66), GM7PKT (IO76), GM8IEM (IO78), GM0OQV (IO85), MM0AMW (IO75), MM0BSM (IO86) before moving to the 2m band where he contacted the SSB stations of GM0HTT (IO89) and GM0PWS (IO87).

At my QTH (Herefordshire, IO81) I concentrated on working as many stations as I could on the 4m band and between 1600-1843UTC I made a total of 22 CW contacts with operators in 7 DXCC and 17 locator squares. It was good to work a number of Dutch stations, recently authorised to use the 4m band. These included PA0RDY (JO22), PA1AT (JO32), for his first G-contact; PA2J (JO21), PA2M (JO21), PA2V (JO23), PA3DOL (JO22) and PC5C (JO33). Further afield, my 4m station of G4ASR made CW contacts with LA3EQ 55A (Norway, JO28) at 909km, OZ2M 52A (Denmark, JO65) 1,091km, SP6GWB 41A (Poland, JO80) 1,371km, SP3RNZ 51A (JO92) 1,452km and SP2JYR 51A (JO92) for best DX at 1,458km. Incidentally to contact stations in Scotland I beamed at 0°, Norway at 15°, Denmark at 20° and Poland at 45°. So, as you can see, it is important to keep moving the beam around to contact different countries. It is also useful to note that you never beam directly to the country you hope to contact as your signals must be back-scattered from the auroral curtain. For example, I worked Polish stations on a beam heading of 45°, whereas the true bearing from my location would normally be 90°.

Whenever there is a good auroral opening, the best DX can always be heard on the 2m band. You'll need to read CW though! Some of the stations worked from the UK included HA1FV, I2FAK, I3MEK, IV3GTH, OM2VL, OM5XX, OZ4ZW, SP2WDW and 9A1UN. Surprisingly, no-one reported making contacts on the 432MHz band, even though during strong auroras such as this event it is relatively easy.

John Regnault, G4SWX (Suffolk, JO02) was active on the 2m band and mentions that at the beginning of the event he was working many DL and OZ stations. However at around 1730UTC the aurora 'turned south', enabling contacts to be made into France (F), Switzerland (HB9), Czech Republic (OK), Hungary (HA), Poland (SP), Italy (I), Croatia (9A) and Serbia (YU). Some of his 50 CW contacts included the stations of HA6NQ (JN98), HA8MV/P (KN06), HA0MK (KO08), HB9DKM (JN37), I1DMP (JN34), OK1TEH (JO70), SP1MVG (JO73), UA2FT (Kaliningrad, KO04), YT3I (KO05) and 9A1CAL (JN86).

Kelvin Weaver, F4VPC (France, IN87) mentions that having heard about the aurora he hastily assembled a 9-element Tonna Yagi and propped it against his garden fence. He heard a number of CW stations with the beam pointing at 45° and these included EI4DQ (IO51), DH8BQA (JO73), G3LTF (IO91), G4ASR (IO81), G4FUF (JO01), G4HGI (IO83), G4LOH (IO70), G4RGK (IO91), G4SWX (JO02), G7RAU (IO90), G0CUZ (IO82), GM4BYF (IO85), GM4VVX (IO78) and GW8JLY (IO81) who was using SSB. He didn't expect to contact anyone, so he was very pleased to contact the station of G4RRA (IO80) at 55A both ways. Kelvin is probably more well known as GW4TTU and as one of the operators of the ZB2IQ and the Squarebashers GB2XJ, GB2YS, GB2ZR expeditions in the early 1990s. He mentions that when another aurora occurs as far south as the event on 15 June he will hopefully have his tower installed and the station fully assembled.

MARINE TROPO I have previously mentioned that Es propagation is not the only way of working very long distances on the 144MHz band. At many times during the year tropospheric paths form that allow contacts up to 1,000km or so to be established at 144MHz and higher frequencies. Conveniently for UK stations, tropo paths over water are much more efficient than over land. That is because the ground topography often disrupts the enhancements caused typically by temperature inversions. There are two main sea paths from the UK, either across the North Sea to Scandinavia or in a south-westerly direction to Portugal and Spain. The latter path offers more DX capabilities, as many stations in southern England, Wales, Scotland and Ireland have a pretty clear shot towards the Iberian Peninsular (CT, EA), Azores (CT2), Madeira (CT3) and the Canary Islands (EA8).

Marine ducting is not as uncommon as some people think. Stations located on the east coast of the UK often experience brief openings during the evening period across the North Sea into Scandinavia on the VHF and UHF bands.

Longer paths also exist, the best of which is the 3,000km span to the Canary Islands and stations located in Cornwall, Wales, Ireland and the Isle of Man can expect to make contacts into EA8 a few times every year. Sometimes the path can extend up to Scotland (Figure 1) or even overland into significant areas of England and Wales.

One of the characteristics of the UK to EA8 path (certainly at my inland QTH in IO81) is that signals are normally quite weak, between S1-3, with cyclic fading into the noise. In my experience signals may peak for 5 or 10 minutes and then disappear for maybe 15 minutes or so before re-appearing. This state of affairs can last for a number of hours. So if you hear that these super-DX stations are being worked on the band it's no good having a casual listen. You must keep tuning around for a number of hours and keep a close ear to the band. Other stations, located in coastal areas with a clear take-off to the south-west, may well find the DX stations romping in at S9 and even workable on FM, as many Cornish stations do every year.

The marine path that produces regular long distance tropo contacts to the Canary Islands is associated with the Azores High. The Azores High, also known as the Azores anticyclone, is a semi-permanent anti-cyclonic region with relatively consistent high pressure over the Atlantic Ocean. In the summer months it moves northwards and has a major impact upon the climate of Europe. The pressure centre often shifts towards the Iberian Peninsula and a ridge may build across France, northern Germany and even the south-eastern UK. This is when stations in southern England, Wales and Ireland may possibly make contact with stations in the Canary Islands over 3,000 kilometres distant.

This year has been a very poor season for Atlantic tropo openings as the jet stream stayed south of the UK for a very long period of time and it wasn't until 26 June that the first opening over this path was recorded. The 2m stations of G4LOH and M0VRL, both in Cornwall (IO70), reported working EA8BPX, EA8CTK and EA8TX. Four other openings were also reported on July 16-18 and 22. The portable 2m station of Dave Edwards G7RAU/P (IN79, Cornwall) reported making SSB contacts on July 16-17 with EA8AVI, EA8BPX, EA8CEQ, EA8CSG, EA8CQW, EA8CTK, EA8TX and EA8YT and at 1715UTC on July 17 the 70cm station of G4ALY (Cornwall, IO70) reported working EA8CTK (IL18) on 432.200MHz SSB over a path of some 2,682km.

DEADLINES. Good luck and if you do hear or work any DX stations on the VHF or UHF bands or have any other news then please send your reports to g4asr@btinternet.com to reach me before the end of each month. Alternatively you can send letters to Yew Tree Cottage, Lower Maescoed, Herefordshire, HR2 0HP.

GHz Bands

International news from Germany, Switzerland and France

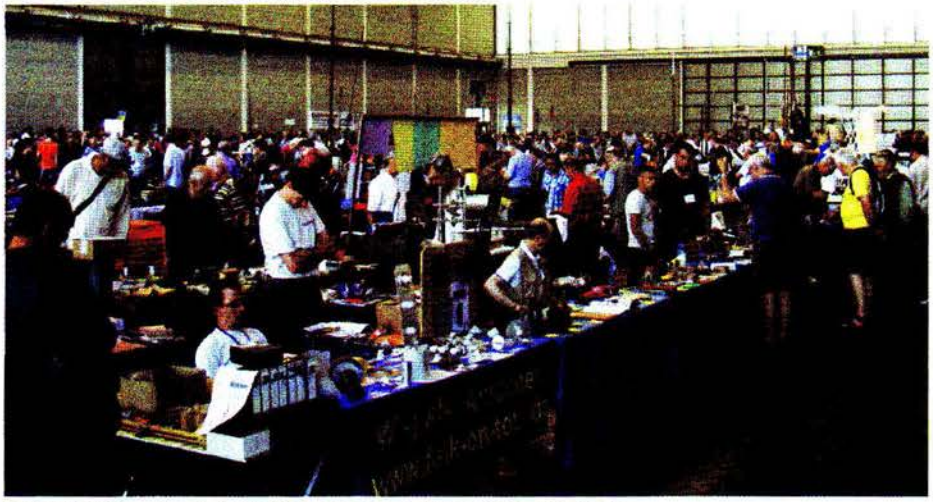


PHOTO 1: View of part of the flea market in hall A3 at Friedrichshafen.

MICROWAVES AT FRIEDRICHSHAFEN. This was my first visit to Friedrichshafen in four years. The previous visit was literally a one-day flying visit, arriving around 9am and flying out around 9pm. To say it was a full and busy day would be an understatement.

This time was to be a more leisurely visit, arriving via Zurich airport and the marvellous Swiss Intercity train to catch the trans-Bodensee ferry from Romanshorn across to Friedrichshafen and returning via the same route on the Sunday. In this case the return route took in a visit to the HB9Q EME Super-station in Reinach [1].

What impressed me about Friedrichshafen was the sheer amount of microwave-related parts available, although to be fair, many of the prices were a little on the high side, seemingly dictated by some of the outrageous prices asked on eBay for quite mundane parts. Once you accepted that you would buy only what you needed and not speculative items, it began to become more enjoyable.

I had been looking for a pair of 6cm band 90° hybrid couplers. I found a pair of Narda couplers, rated at 50W, for an asking price of €60 each. The trader eventually took €100 for the pair, but not before some interesting haggling in broken French!

Carefully searching the tables and in boxes under the tables in Hall A3 or A4 you could find almost anything you might be looking for. You can see some of the activity in the flea market in hall A3 in **Photo 1**.

Back in Hall A1, the main hall for commercial traders and various Radio Societies, it was good to see that there was an interesting selection of microwave parts and modules from the likes of Kuhne Electronic (DB6NT) and SSB Electronics. Schubert, Gmbh, were doing a good trade in tin plate boxes, ABS plastic masthead enclosures and sundry small parts that are always useful to have in the shack. Wimo were selling antennas including their very popular 23 and 13cm Yagis.

At the far end of hall A1 the RSGB stand attracted a lot of attention. The RSGB range of books are very popular and I judged that the book sales were very good.

One of the highlights of the event was the trophy presentations, by DARC, to the winners of the various sections of the October 2011 IARU Region 1 UHF/Microwave contest. Our own John, G3XDY, was the overall winner of the Single Operator section and he was presented not only with the trophy as overall winner of this section, but he also staggered away with the Single Operator band trophies for 23 and 6cm as well. Well done, John. **Photo 2** shows John with his three trophies that had to be transported back to the UK by car, courtesy of the Camb Hams group.

PHOTO 2: G3XDY received three trophies for winning the overall Single Operator and individual 23 and 6cm band October 2011 IARU Microwave Contest.

Although, by some reports, attendance was down on the 16,300 figure for 2011, this is still the biggest ham radio event of its kind in Europe and not that far behind Dayton. And the location and some approaches are very much more scenic!

I plan to be back in 2013. It was most enjoyable.

HB9Q SUPER STATION. This really is a super station in every meaning of the word, including cost, performance and ability.

The station is located next to an industrial area in the small town of Reinach in the canton of Aargau in Switzerland. Currently the station consists of a 15.1m dish reflector, large mast with 8 x 19-ele 144MHz Yagi array for EME and an HF Yagi array mounted on an old rotatable crane base and tower section. A 6m diameter solid dish is about to be located on an adjacent open area. Whilst the large dish is suitable for use up to 3400MHz, the smaller dish is required for the higher bands, where dish profile and accuracy is paramount.

A two-story radio building, suitably lined with metal mesh as a Faraday screen, is located next to the large dish. It also acts as the radio room for the HF group. The top of this building is reinforced and is the work area for changing dish feeds for the large dish. Part of this area is taken up by a large 'locker' room, where the feeds for those bands not in use are stored away from inclement weather. **Photo 3** shows the 15.1m dish, with the radio building on the right.

HB9Q is run by a small group led by Dan, HB9CRQ. One of the other team members is Alex, HB9DRI. It was Alex who showed

FORTHCOMING MICROWAVE EVENTS

Weinheim GHz Tagung 2012, 14 to 16 September. Details: www.ukw-tagung.org

Crawley Microwave Round Table, September. Details: GOFDZ.

RSGB Convention, Horwood House, near Milton Keynes, 12 to 14 October. Details: www.rsgb.org/rsgbconvention

Microwave Update, 18 to 21 October, Santa Clara, California. Details: www.microwaveupdate.org

Scottish Microwave Round Table (GMRT), 3 November, Burntisland, Scotland. Details: www.rayjames.biz/microwavert

John, G4BAO and I around the station on that Sunday morning.

We were shown the various parts of the station and stood on the radio room roof whilst the computer controlled dish 'delivered' the 23cm and 2m feed to a convenient point that allows inspection of the feeds, as well as the ability to quickly change these for other bands such as 70cm and 13cm. **Photo 4** is a close up of the 23cm band feed, as fitted during our visit **[2]**.

Inside the radio room the main IF transceiver for the higher bands is a Flexradio 3000 with computer control and two rows of 6 x 23 inch Samsung monitor displays. **Photo 5** shows Alex in front of the control displays.

One of the real 'treats' of our visit was being able to call on SSB and listen to our own voices coming back from the moon, 2.5 seconds later. I've heard many SSB signals off the moon, but none as loud as these!

Photo 6 shows the HB9Q 23cm band W2IMU feed with four x 3-ele Yagis, two horizontal and two vertical, for 144MHz. With the HB9DRI dual polarity IQ Plus receiver system, Faraday rotation is no longer a problem for this big station.

5.7GHz EME SUCCESS. Guy, F2CT, and his friends activated the Pleumeur Bodou (IN88FS) 13.5m dish for the 50th anniversary of the first successful Telstar Transatlantic TV broadcast on 11 July **[3]**. They activated the dish on the 5.7GHz band using EME and the callsign TM8PB from 9 until 11 July. This provided me with the incentive to finish my 5.7GHz EME system, which I have mentioned several times in this column over the last few months. I am pleased to report that I successfully worked the station using 16W to my 2.3m dish. I achieved my stated intention of making at least one QSO off the moon on 6cm before the International EME Conference in August. At the time of writing (mid July) I have worked four different stations on the band and heard another six.

The TM8PB station reportedly had 25MW (!) EIRP available. Their signal was rather weaker than expected and just workable on my dish. Several other well-established stations, such as F2TU and W5LUA, were up to 10dB stronger. To be fair, this is not an unusual situation for big dish systems operating for the first time off the moon and is sometimes due to their rather narrow beam width, which often means that they don't effectively illuminate the right *part* of the moon disc. I am sure that by the next time this dish is activated they will have improved their aim and they will be able to work dish systems as small as 1m diameter anywhere in the world.

WEBSEARCH

[1] HB9Q – http://hb9q.ch/version2/index.php
[2] W2IMU feed – www.ve1alq.com/images/w2imu.gif
[3] Pleumeur Bodou – www.pleumeur-bodou.com

PHOTO 3: View of the HB9Q 15.1m dish and radio room.

PHOTO 4: Close up view of the HB9Q 23cm circular polarisation feed horn. This is a W2IMU dual mode horn feed with screw polariser.

PHOTO 5: Alex, HB9DRI, in front of the station control display system.

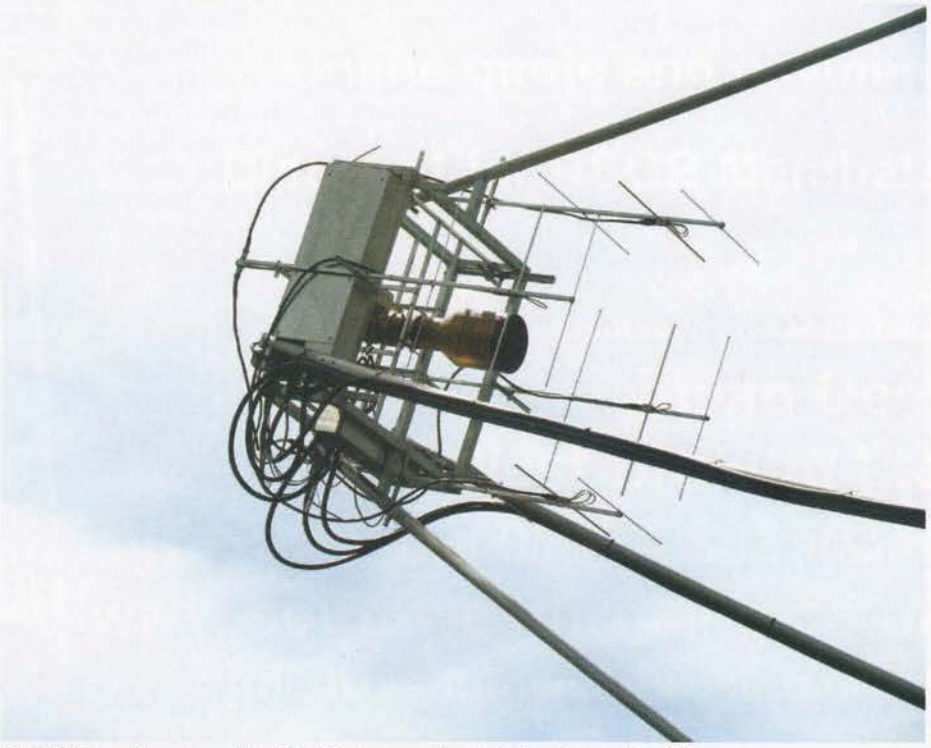


PHOTO 6: Another view of the HB9Q 23cm and 2m feeds in place on the dish.

More on LED lighting

Greater Manchester RAYNET chose their 'Control' gazebo LED lamps with care and get excellent results, with no RFI problems

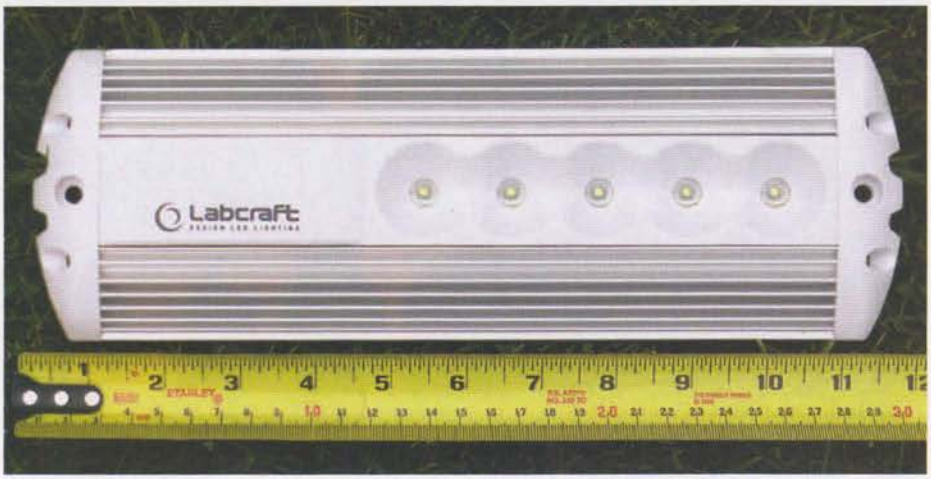


PHOTO 1: The Labcraft S13_5-3 MV Hyperlux™ LED lamp draws just 15W yet provides more light than a typical 60W incandescent bulb.

RECAP. In the June *RadCom* EMC column there was a report of a RAYNET group that had tried using inexpensive 10W LED floodlights at an overnight event. Unfortunately they suffered from severe radio interference problems caused by the switch mode converter integral to the lamps. The lamps, which were sourced from the Far East via eBay, did not carry a CE mark.

STATE OF THE ART. LED lighting is very attractive. It's very energy-efficient, to the extent that 8 hours of room-level illumination can be achieved from a single 12V 12Ah lead-acid battery. But this is all to no avail if RFI disables your radio equipment. The likelihood of RFI is down to the design of the switch mode DC/DC converter integral to the unit.

I wanted to obtain some high efficiency lighting for my own Greater Manchester RAYNET operations. Taking a 60W incandescent equivalent as my benchmark (see **Table 1**), I set about looking for a quality LED lamp unit. I went in search of a reputable UK manufacturer, hoping to avoid previously reported problems with low cost Far Eastern suppliers.

My research led me to Hyperlux™ LED units by Labcraft [1], as seen in **Photo 1**. Although several times more expensive than the 10W 12V LED floodlights from eBay, the specifications were impressive, as shown in **Table 2**. These lamps are IP67 rated – cleanable with a power washer! Labcraft specialise in lighting for HGVs, where any fitting has to be robust to survive.

I contacted Labcraft and explained my intended use in a RAYNET 'Control' gazebo, in close proximity to radios. I enquired about RFI which, if present to any degree, would entirely negate my interest. The Technical Director was open and honest, saying that although he had a range of technical data to hand he wasn't certain he could give detailed figures for RF emissions in the 2m band – but he asked if I would like to try the units on approval...

You don't get that sort of customer service too often these days so, with nothing to lose, I requested two S13_5-3 MV lamp units for trial over approximately one month. Impressively, they arrived the next day.

TESTING. In order to see what the sample lamps were like for RFI, I enlisted the help of Chris, G4HYG, who makes and sells filters, APRS units, SDR packages and other software support for amateurs [2]. He kindly offered the use of his HP 8922H spectrum analyser for testing the samples.

Connecting a plastic covered aerial to the spectrum analyser, we swept it thoroughly across the entire surface area of the Labcraft Hyperlux lamps and the associated power supply leads. We were unable to detect *any* RF emissions!

A further test was conducted in the Bolton RAYNET meeting room, which was being lit by the Labcraft lamps at the time. Using radios, we checked Top Band, 80, 40, 20, 10, 6, 4, 2m and 70cm, finding no trace of any problem.

Never entirely trusting 'laboratory' testing to give the whole story, the lamps were next taken out on RAYNET duty at Bolton Hospice Midnight Memories walk. The two units provided all the light (almost *too* bright!) in our 3m x 3m gazebo, without a hint of RFI on 2m or 70cm. The lamps ran continuously and cool from 2100 to 0500 the following day.

CONCLUSION. Whilst this is a largely non-technical account of my experiences sourcing robust, weather resistant, low-consumption, 12V powered LED lamps, I hope it has been useful. I would like to express my thanks to the staff at Labcraft (Design LED Lighting), for their excellent product range and customer support. In my opinion they have shown themselves to be the company to choose for 'radio friendly' LED lighting.

For further information or details of our installation at Greater Manchester RAYNET, please contact me via the e-mail address at the top of the page.

WEBSEARCH

[1] Labcraft - www.labcraft.co.uk/index.php
[2] Cross Country Wireless - www.crosscountrywireless.net

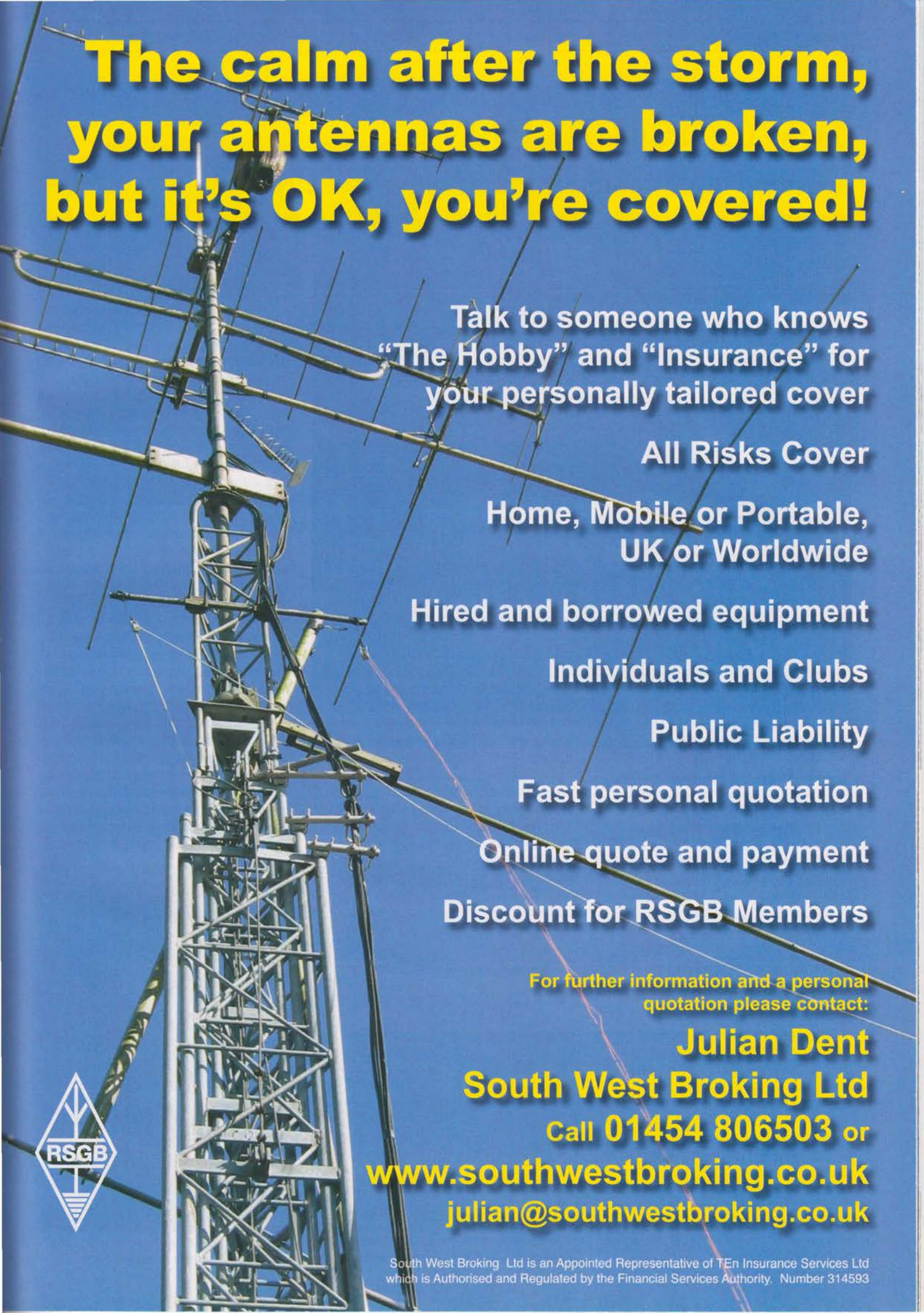
TABLE 1: Approximate lumen output of typical incandescent bulbs.

Incandescent lamp	Lumens
40W	450
60W	800
75W	1100
100W	1600

TABLE 2: Abbreviated specifications for Labcraft S13_5-3 MV Hyperlux™ LED light.

Supply voltage	10 – 32V
Current at 12V	1.25A
LEDs used	5 x 2.5W Cree
Light output	875 lumens

PHOTO 2: Even before night fell, the sheer power of the LED lamps was plain to see.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Tower Technology

Learning more about towers from Upshot UK

The new 31.5m trailer tower.

NEW OR REFURBISHED. Upshot UK (www.upshot-uk.com) is a new advertiser in *RadCom* who deals in both new and refurbished towers as well as ground-based aerial photography. With such an unusual range of business it was time for *RadCom* to pay a visit and learn more.

James Pickance founded the company in 2006, having worked in the telecoms industry for a number of years. He was familiar with the idea of using telescopic masts for inspecting installations but realised that there was room for expansion into structural inspections. Upshot has their own fleet of vehicles fitted with 24 or 26m masts that are equipped with high resolution digital or thermal imaging cameras. From the control room fitted inside the van, the operator can view the roof or other structure without ever leaving the ground. These days they also undertake radio coverage testing and line of sight checking for telecoms operators.

About four years ago, Upshot purchased a warehouse full of trailer masts. They were refurbished in their workshop and sold. It was obvious that there was a real market for these trailers. The company has continued to buy old masts to refurbish. But, as finding the masts needing refurbishment becomes more difficult, Upshot UK has started building new ones too as demand is outstripping the availability of refurbished masts.

Their design is based on the single axle Versatower because that seemed the most manageable for their customer base. These new trailer towers are built in line with the new EU codes that have changed in recent times, leading to larger bar sizes and the like. The towers have undergone non-destructive testing and are going through the CE process ready for CE approval. The company has gone on to build a new 31.5m trailer tower, which was built in conjunction with a leading telecoms company. These units are much cheaper to deploy, they don't need a lorry to tow them on site and they can be rigged on the ground so you don't need a cherry picker to rig them at full height. During development they discovered that if you guy every section it has an adverse effect on the performance of the mast – it increases the download through the mast. Legs have been added to take the load directly down to the ground, as there is a five tonne point load at the bottom of the tower. So Upshot UK have 'beefed up' their designed to remove these problems. Catcher plates have also been removed from the 31.5m design to meet the EU code because the bar that they would rest on are not designed to take that kind of load. The end result is a fully coded product that can be supplied to any market.

In their range of new towers there are designs for 40, 60 and 80ft versions and, for non commercial locations, a 100ft version is possible.

Although the 31.5m multi-op version weighs 2.5 tonnes, it has been designed to be towed by a Land Rover, Discovery or Defender (these can tow up to 3.5 tonnes). The trailer has a double axle so you have about 1 tonne of capacity on the deck of the trailer for antennas or other equipment. It is sold with a 3 tonne tow hitch so customers shouldn't be able to overload the unit without upgrading the tow hitch too!

At the very top of the range of towers Upshot produce is a 30m lorry-mounted, self-guying mast. The outriders fold out from the structure, although it still has a fairly small footprint. With ISO fixings, it's been designed to fit a standard shipping container so that it can be deployed anywhere in the world.

All the cables are made specifically for Upshot UK and are fully certified. Lifting wires are all anti-twist and different wires are used for guy ropes – part of the EU code.

Upshot has teamed up with a firm of structural engineers who do all the calculations to satisfy the Health & Safety Executive. Anyone using masts in a commercial setting has to have a set of calculations done for the kit to be deployed on the mast that shows the weight of the equipment, wind loading and the like. This paperwork is essential for risk assessments and to show that installations are fit for purpose.

A partly completed tower, back from being galvanised.

Anti-twist cables.

A tower awaiting refurbishment.

On this new 31.5m tower there's a 49kg pole that bolts on to the top of the mast that is long enough to accommodate two operators' worth of kit. The flat plate bolted to the mast sits at 30m and goes up to 31.5m with the pole. It can take a rotator cage – these are designed and built by Upshot UK to suit the customer's requirement.

For commercial installations, the EU codes regarding guy radii and anchor loads have changed and Upshot UK has designed their masts to take this into account. For example, in the past, an anchor load for a 28m tower was a 2 tonne concrete block; that has gone up to 4.7 tonnes.

REFURBISHMENT. Upshot UK does still get old trailer masts that require refurbishment. The company has a small industrial unit as well as storage at a nearby farm, which means they can work in the dry – no muddy fields – by towing the units up and down from the farm. It also means they have fields available to demonstrate the trailer towers or try them out once all the work has been completed. We visited the farm storage site to see the three trailers masts awaiting refurbishment and the one that has recently been finished for an amateur radio installation.

Refurbishing these second hand masts is not a quick and easy process. A number of items have to be either replaced or completely overhauled to get both the trailer and mast in first class condition. All nuts and bolts on the complete unit are replaced. The trailer is cleaned and de-greased and then the brakes, axle, tyres and tow hitch are all checked and either refurbished or replaced. If the tyres need replacing they are replaced with Land Rover tyres and the trailers are given new jack stand legs and plates. The equipment boxes are either sand blasted and re-sprayed or replaced completely depending on the state of the originals. The winches are replaced with a power winch that could be new or a refurbished unit depending on the customer's requirements. All the rigging is replaced with anti-twist rigging. The trailer mast goes to the customer fully certified with magnetic lights that can be removed when the trailer is not on the road.

James said, "What's intriguing about the amateur radio side of things is the fact that you've got individuals in the market that are also working in the commercial market".

So far, their advertising has brought enquiries from both the UK and European amateur market. It was an interesting visit when we learnt a whole lot about tower construction.

The equipment boxes are either sand blasted and re-sprayed or replaced completely.

Upshot UK have storage at a local farm where trailers are stored awaiting collection or refurbishment.

I'd been looking for a mobile tower for some time when I spotted the Upshot advert on eBay. The contesting and DXing stations I'd had the good fortune to operate while living in California gave me a taste for serious (= large!) HF antennas, so I needed to find a tower to match. The UK has very few tower suppliers for the amateur market and none that I could find with towers in their standard range that are capable of safely supporting a big HF array. So the Upshot extra heavy duty trailer tower was a great find, which would allow testing of several locations to ensure optimum performance and minimum visibility for neighbours.

James at Upshot was extremely helpful with information about the tower. I visited Upshot to discuss the details of the refurbishment and to see the tower first hand. Actually towers – at that time he had four of the 30m towers and several other even larger beasts in his yard. The previous owners of my tower had been using a large array of microwave antennas, but collaboration with James and his team resulted in the design and fabrication of a new head unit to fit a rotator capable of turning (and holding still!) 2m^2 of antennas; Upshot were also able to supply a galvanised certified high-strength steel stub mast to take the Optibeam OB4030 and 4-element Ultrabeam 6-20 aerials that I had selected.

The refurbishment is now complete. Upshot includes a training and familiarisation day for those, like me, new to ownership of a tower of this scale. Seeing the finished item in action is exciting – now I can't wait to get the aerials on board and operate during the winter season. Throughout the process, Upshot has been straightforward to deal with and have accommodated my exacting and evolving requirements. I look forward to working with them when the time comes to specify the fixed towers for the rest of my antenna farm.

David Aslin, G3WGN

YouKits FG-01 Antenna Analyser

Getting the best from your antenna is worth the effort

PHOTO 1: Thanks to modern microcontrollers, sophisticated antenna analysers are now available.

EFFICIENCY IS ALL. Whether you operate QRO or QRP, getting every last milliwatt of power into the ionosphere challenges all radio amateurs. The match between the transmitter and antenna is crucial and whilst the SWR meter provides a useful indication, the need for more information has spawned a market in antenna analysers. At one time an antenna analyser would probably have cost more than your rig but thanks to modern microcontrollers, sophisticated antenna analysers are now available for around the 200-300 pound mark. The YouKits FG-01 reviewed here comes in at the lower end of the price range but boasts a wide range of features and provides continuous coverage from 1MHz to 60MHz.

WHAT DO YOU GET? Although the FG-01 is supplied by YouKits, it is not a kit at all but a fully assembled and tested unit that's ready to go. The basic unit is supplied with a three-cell battery holder for fitting 3.7V lithium cells and an external supply power lead. The external supply needs to provide 10-12.8V DC (regulated) at about 400mA. However, the review unit was supplied with the optional internal supply that comprised a sealed pack of three 14500, 3.7V lithium cells and a dedicated lithium mains charger. This was well worth the extra cost, as trying to operate the FG-01 with a trailing power lead was not very convenient for antenna tuning. The supplied batteries had a capacity of 2.2Ah and the FG-01 typically draws about 400mA so they should give around 5 hours of continuous operation, which is plenty.

INSIDE. The FG-01 uses surface mount devices throughout, which is probably why it's not available as a kit. I've shown a simplified block diagram of the analyser in **Figure 1**. The measurement frequencies for the FG-01 are generated by an Analog Devices AD9851 direct digital synthesiser (DDS) chip that employs a temperature controlled crystal oscillator as its reference. The output of the DDS is amplified by an RF2317 low noise amplifier before being applied to the RF bridge. The sense outputs from the bridge are measured using the analogue to digital inputs of a PIC 16F886 microcontroller, which is the nerve centre of the FG-01. In addition to taking measurements from the bridge, the PIC creates the display and controls the test frequency of the DDS using inputs from the tuning knob and associated push-button. Construction quality was good and the unit was housed in a very sturdy steel box. The antenna under test is connected via a 50Ω BNC jack and the power connection used a standard coaxial power jack.

OPERATION. Operation was very simple and cleverly controlled via the single knob on the front panel. The knob operated a rotary encoder with 20 clicks for a full revolution and had a push-button function when depressed. A look at **Photo 2** shows that the FG-01's compact screen is contains a lot of useful information. The main screen dominated by the graph that plots the output from the RF bridge and shows the SWR and impedance of the antenna under test. The impedance display does not show the nature of the impedance but simply its value in ohms. Although the plots are different colours I found it easy to get confused between the two plots. One solution available here was to suppress the impedance plot. This plot can be toggled on/off by powering-up the FG-01 with the tuning knob held in the depressed position. Immediately below the plotting area the display shows the centre frequency, sweep width, SWR and impedance readings. As you can see from **Photo 2**, the display also has a handy battery voltage indicator – as long as it's above 10V you're OK.

A major advantage of the FG-01 over many of the other hand-held antenna analysers is the fact that it sweeps a band of frequencies so gives you an immediate visual indication of the antenna's performance over that range. I found this particularly helpful when tuning my Butternut HF9V vertical. This is a resonant antenna and the bandwidth on some bands is extremely narrow, so you have to carefully adjust the antenna for optimum performance on the required bands; the FG01 really helped here. The bandwidth of the sweep and the centre frequency are both adjustable using the single knob. By depressing the tuning knob you could toggle between setting the bandwidth and the centre frequency. The bandwidth settings were well chosen with the following options: 0, 10kHz, 20kHz, 50kHz, 100kHz, 200kHz, 500kHz, 1MHz, 2MHz, 5MHz, 10MHz, 20MHz and 50MHz. The wider sweeps may seem a bit extreme but they can be useful when checking the overall performance of the system and can be helpful when fault finding. The 0 setting for the bandwidth simply stopped the sweep and restricted the FG-01 to a single measuring frequency.

The tuned frequency adjustment was very well implemented and by pressing and holding the tuning knob one of the tuning digits was highlighted in red and you could turn the tuning knob to select different digits. The highlighted

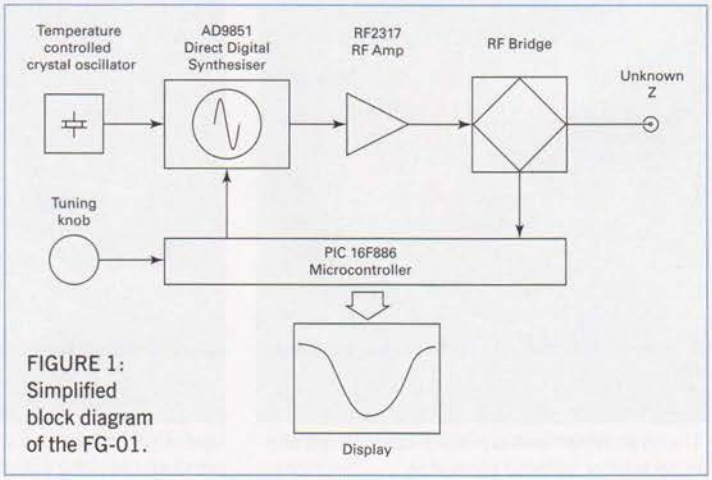

FIGURE 1: Simplified block diagram of the FG-01.

PHOTO 2: FG-01 Analyser screen layout.

digits were in fact the tuning steps. Using this system you could set each click of the knob to increment the centre frequency in 1kHz, 10kHz, 100kHz or 1MHz steps. It may sound a bit convoluted but in practice it was very intuitive.

IN PRACTICE. For use with real antennas, the optional battery pack is a must as it transforms the FG-01 into a highly portable hand-held tool. As supplied, the battery pack rattles around a bit inside the case so I think I would add some foam padding to stop this. My poor old Butternut antenna is a great favourite with the local wildlife as birds seem to love jumping up and down on the capacity hats and I have families of spiders in and around the main coils and capacitors. As a result of this popularity, regular visits down the garden are necessary to keep it in good order. In the past I've borrowed an MFJ-269 for this task but this is a single frequency, manually tuned device, so I inevitably end up using a clipboard and pen to note the readings as I stretch and squish coils to get the best overall result. The FG-01 made the process very much simpler as I was able to set it to sweep across the desired bandwidth and make all the adjustments just by watching the display – no paper, so it's eco friendly as well! This was particularly helpful when adjusting the capacity hats and coils mounted part way up the antenna as I could still read the display with the meter on a stool at the base of the mast.

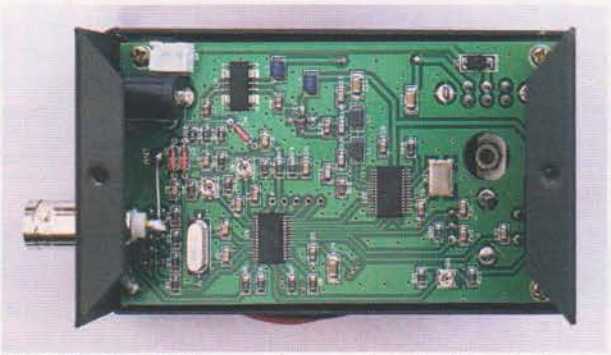

PHOTO 3: The FG-01 uses surface mount devices throughout.

The sweep display of the FG-01 was also very useful for fault-finding. When I did an initial wideband sweep of my antenna I found that the 21MHz reading was flickering as the antenna flexed in the wind but most of the other measurements were stable. A quick look at the Butternut diagram reminded me that it uses an open-circuit stub to electrically shorten the vertical pole to make a quarter-wave vertical on 21MHz. The cause of the problem was thus very quickly isolated to a poor connection on the lower end of the stub. The bright display used in the FG-01 worked extremely well for me and I found it was perfectly useable outside, even in bright sunlight. I also found the FG-01 excellent when cutting resonant stubs, as the swept display gave a very clear indication as you approached the desired frequency – much easier than using a single frequency analyser.

SUMMARY. The FG-01 was a real pleasure to use and the frequency sweeping made antenna adjustments very much quicker. The adjustable sweep ranges were well chosen and easy to use and the display was clear and concise. If you enjoy antenna tuning or have an antenna that needs regular attention, the FG-01 is well worth considering, especially with the free charger and battery in the Members' offer. My thanks to Waters & Stanton for the review equipment.

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DC-4 Fits new Yaesu FT-950/450, etc ..... £22.99 P&P £4

Start Here

A short history of radio (part 2)

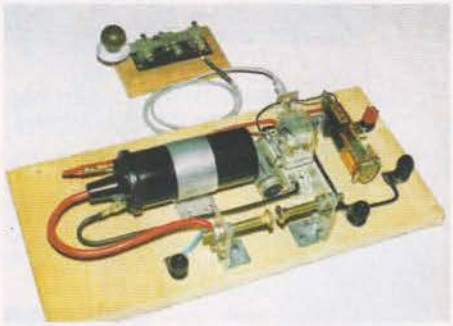


PHOTO 1: My experimental spark transmitter.

LATE 19TH AND EARLY 20TH CENTURY. In July's Part 1, I described the discovery of electromagnetic waves. The next problem was to generate and receive them efficiently. This mainly revolved around improving the sensitivity of the receiver. The gradual evolution of a workable wireless telegraph system was not a smooth process conducted by a team of patient scientists. It was often a scramble, with much hostility, in many cases by charlatans, to corner what promised to be a lucrative market. There were electrolytic and thermo-electric detectors, those that relied on magnetic saturation, plus various non-linear devices like rectifiers, though these were hopelessly inefficient compared to modern diodes.

THE COHERER. The first real breakthrough, though they didn't realise it at the time, came around 1895 from a Frenchman, Professor Edouard Branly and an Italian, Professor Calzecchi Onesti, working independently. They discovered that a loose collection of metal filings normally did not conduct electricity, but when subjected to wireless waves produced by an electric spark, they could conduct well – until they were shaken, when again they became non conducting. This first device was improved by British scientist Oliver Lodge. He named it a 'Coherer', as he believed that the particles cohered (moved closer together) under the influence of wireless waves. This first efficient device for the detection of radio waves is now generally known as the Branly-Lodge Coherer (see **Figure 1**), to distinguish it from later, more efficient types.

There is still some controversy as to how the device works. One theory said it was based on electrostatic attraction, another that microscopic welds occurred between the particles. Modern experience with MOSFETs suggests that the oxide (or other very thin insulating layer) covering the metal particles breaks down at a certain voltage, enabling the particles to come into contact. Whatever the mechanism, I decided to make such a device and measure its properties.

HOMEBREW COHERER. The original patents describe ordinary soda glass tubes with platinum wires sealed into them. These were sometimes partially evacuated, but for cheapness and convenience I used 6mm ID polythene tube with brass end plugs. The first thing for a would-be experimenter to be aware of is that "a glass tube filled with iron filings" is misleading. Iron was the worst of all the filings I tried. They work on the day that the iron is filed, but progressively deteriorate thereafter. The original literature describes "a small quantity of nickel filings, to which were added a small percentage of silver filings, lying between silver electrodes". The nearest I could come to this was cupro-nickel, obtained by filing an old 50p piece. I tried both fine and coarse filings. I used cylindrical end plugs turned down to tightly fit the polythene tube, rather than the tapered ones advocated for the more sensitive devices. I also tried different distances between the end plugs.

I measured the DC resistance after shaking the tube, then applied a steadily increasing voltage until, suddenly, the resistance fell to a low value, which I again measured. The results were moderately repeatable.

With cupro-nickel filings and 12mm end plug spacing, the pre-breakdown resistance of 300kΩ fell, after breakdown, to 100Ω. As the distance between the end plugs was reduced, both the pre- and post-breakdown resistances fell, but the ratio remained approximately constant. Marconi talks about "finely sieved filings". I didn't sieve mine, but collected them straight off the file. I got the impression that coarse filings worked better than fine ones. Brass filings or chips gave the lowest resistance of those I tried. The sensitivity as a pure voltage detector at DC was pretty terrible, needing about 10 to 15V to produce the low resistance state, though, as indicated later, sensitivity to RF may be better.

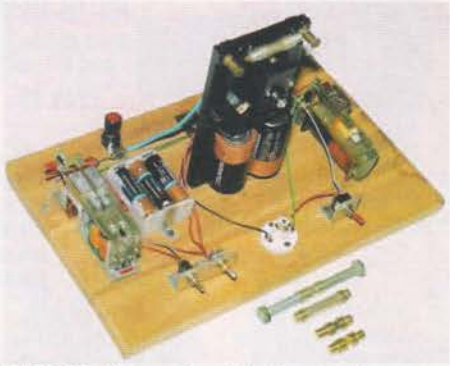


PHOTO 2: My experimental coherer receiver and some experimental coherers.

MOVING ON. The next stage in my investigation was to build a simple spark transmitter and coherer receiver. I wasn't going to put my transmitter on the air, so I didn't need the prodigious voltages and power of the early Ruhmkorff coils. I settled for a 12V car ignition coil and, to get repetitive sparks, I used two relays: one, rather delicate, as a buzzer and the second, operated through the current contacts of the first, to interrupt the 8A primary current of the ignition coil. **Photo 1** shows the transmitter.

Branly-Lodge Coherers are not self restoring. Once switched into the low resistance state it remains there until shaken or tapped. Lodge used a clockwork tapper to continually tap the glass tube; Marconi used an electric tapper based on an electric bell to give a single tap whenever the resistance of the coherer fell sufficiently to pass current to the solenoid of the tapper. I opted for the Marconi system, using a modern electric bell, with a sensitive relay to detect current through the coherer. A second relay operated a bulb to register the signal (**Photo 2**). **Photo 3** shows a close-up of a coherer.

RECEIVER RESULTS. With an antenna about 60cm long on the receiver and no aerial on the transmitter, the reliable range was about 3m. Using a 1MΩ x10 probe on an oscilloscope, I attempted to measure the voltage across the coherer required to light the lamp. The measurements were not very precise, but I got the impression that the coherer was rather more sensitive to RF than to DC, which I thought might have something to do with the capacitance between the metal particles in the pre-breakdown state. I measured this as less than 1pF.

I will continue this series in November, turning to a different subject next month.

A version of this article was previously published in *Verulam News*; it is reproduced here with their kind permission.

PHOTO 3: Close-up view of a coherer.

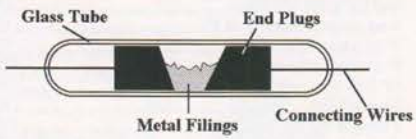


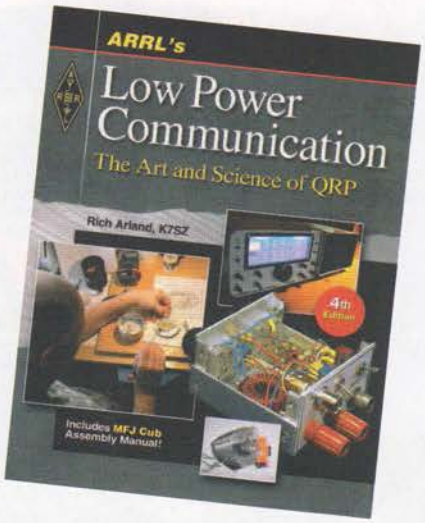
FIGURE 1: The Branly-Lodge Coherer.

Book review

QRP and *real* DX

ARRL's Low Power Communication

by Rich Arland, K7SZ



Sub-titled The Art and Science of QRP, this book is one that I felt I was going to like from the moment I first glimpsed its cover. I wasn't disappointed – K7SZ is clearly an enthusiast; he also has the ability to communicate his enthusiasm through the written word. He says that QRP as ecologically friendly, usually compact – and relatively inexpensive!

After a couple of short chapters setting the scene, Chapter 3, Getting Started, touches on several kit and commercial QRP radios, takes a high level look at antennas, then has a 'virtual operating session' in which K7SZ smoothly imparts some valuable hints and tips. These all provide context for the next three chapters, which go into much more detail on radios old and new, operating tips and antennas for QRP. The latter contains several practical homebrew designs, advice on different commercial offerings, plus some notes on portable and stealth antennas.

Knowing your propagation is a key tool for the QRP enthusiast. But the Propagation chapter also contains one of the fundamental home truths of amateur radio: "... don't take anything for granted when it comes to HF propagation. Get on the radio and make some contacts!". Other gems of sideways thinking pop up throughout the book, often where you least expect them.

Station accessories such as test gear and keyers get a mention, then there's a look at specialised QRP modes, with some interesting food for thought – many portable satellite operators use a hand-held Yagi with a QRP radio like a handhelds or Yaesu FT-817 to make VHF/UHF contacts over long distances via satellites. And recent modes (such as PSK31, JT65 and many others) can open up surprisingly long ranges from signals below the apparent noise floor.

One use I hadn't really thought of for QRP is emergency comms, but K7SZ has a whole chapter on this. In a tight spot with limited power availability, you get much longer operating times on QRP for a given amount of battery capacity.

Other areas that the book covers include vintage/military equipment, plus there's a showcase of homebrew and kit QRP and related equipment and a list of (mostly American) commercial QRP equipment sources. Finally, just before a Notes section and Index, there's a 43-page complete assembly manual for the 40m MFJ Cub QRP CW transceiver. This seems incongruous, until you discover that the ARRL offers that kit with the book as an optional extra. This offer is not available in the UK but MFJ Cub kits are available from W&S.

Overall, I liked this book; it covered the subject in a good humoured and fun but not overbearing way. It conveys a lot of information without breaking a sweat – just like QRP, in fact.

ISBN 978-0-87259-582-8
320 pages, 185 x 228mm approx
Non-Members' Price £22.99
Members' Price £19.54

EME 2012 Conference Papers

Edited by Ian White, GM3SEK

Taking place in Cambridge from 17-19 August, EME 2012 is the 15th International EME conference. It is the event for everyone interested in earth-moon-earth communications, attracting the highest calibre speakers and participants. Prior to an event such as this, there is normally a Call for Papers, for presentation at the conference. The Chairman of the organising committee, Graham, G4FSG is quoted as saying that the "response to the Call for Papers was almost overwhelming – the number and quality were excellent, and we had a real challenge identifying those to be formally presented." This book collects all those papers together; although I am not an experienced EME enthusiast I can definitely see what Graham means. The coverage is truly breathtaking, ranging from a review of EME system performance in the 1960s/70s through to cutting edge of weak signal performance today. In all, there are some 22 papers in the book – but that's not all, as they say. The book is accompanied by a DVD that contains all 22 papers (many in expanded form), a further two papers that didn't make it into the book, plus the files for five multimedia presentations that will run alongside the main conference sessions. There is a further folder of technical contributions from the UK Microwaves Group (*Backscatter*), advertisers, and several individuals.

If you have any interest in EME, or weak signal work at VHF and above, I am confident that you will find this book fascinating.

ISBN 9781-9050-8683-2
208 pages, 210 x 297mm approx
Non-Members' Price £17.99
Members' Price £15.29

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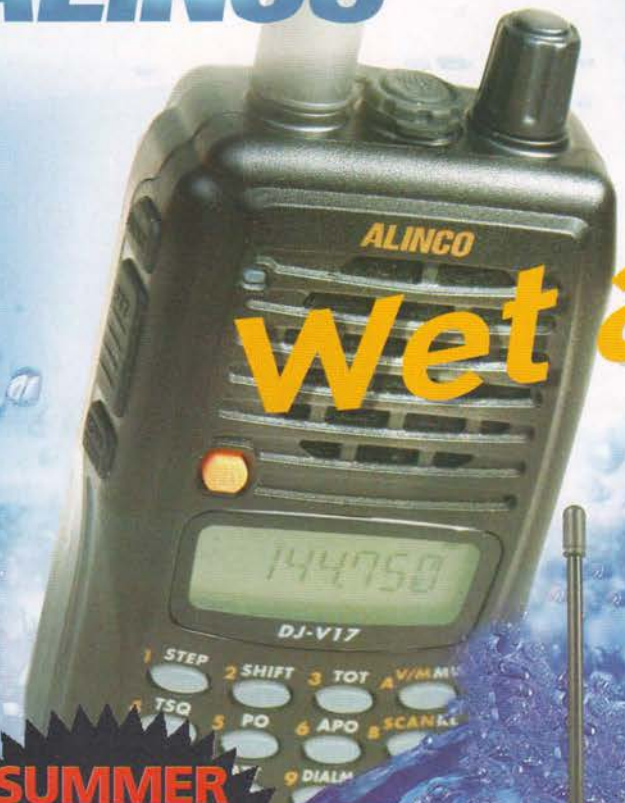
ALINCO

Wet and Wild



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Sport Radio

Reviews of two events taking place again this month – and VHF NFD turns into a mudfest…

PHOTO 1: Clive O'Hennessy, GM4VVX operated roadside portable for the 144MHz Trophy Contest last year.

A DAY WITHOUT RAIN. Clive O'Hennessy, GM4VVX is well-known to those who contest on the VHF bands. After the 144MHz Trophy Contest last year he wrote and included some photos of the site where he had operated portable (in IO78UB). He entered the Six Hour Others section on Sunday 4 September. As Clive says; "The weather was perfect, with high light cloud, no rain, no wind, and best of all no Scottish midges, but RF conditions were terrible. My second QSO was to the West Country, so it looked OK, but it took 2 hours 40 minutes to get my first answer to a CQ! I had to go search and pounce to get anything, because if I could find anyone actually beaming to GM I could work them OK.

"I made 27 QSOs in the 6 hours that I was QRV, which was almost three times my last try in this contest. My station was an old TR-751E into a Linear Amp UK 3CX800 that will only produce 300W output when running from my generator. The antenna was a 9-element F9FT at about 5m AGL (see **Photo 1**). The site is 310m ASL, with a view of the sea to the east and south east. The big problem is the Cairngorms – a 4000ft-high pile of magnetised granite between me and the rest of the world." The problem is indeed those mountains, which present a huge impediment to working most of Britain from the north of Scotland, even for someone on a hilltop. It really does prove that on VHF takeoff is everything. If Clive operated from somewhere near Aberdeen he might be able to get a clear shot past the Cairngorms, but he would have to drive a long way to do it.

VHF NFD WASHOUT. This year the weather wasn't kind to the teams involved in VHF NFD. After the wettest June for over 100 years, the first week of July was *really* wet and a deluge was forecast for the Saturday, so some teams e-mailed the Contest Committee in advance to advise that they were calling off their entry. This was much appreciated by the CC, because it meant inspectors didn't waste their time visiting stations that weren't there.

On the Saturday of VHF NFD as much as five inches of rain fell in the south west of England, causing landslips and severe flooding. And it wasn't dry elsewhere, so the hardy souls who decided to brave the elements were treated to rock strewn tracks, fallen trees, floods and lots and lots of mud. Expect to read some tales of woe when the results feature appears in *RadCom*.

CONSIDERING THE ODDS. I don't often write about my own participation in contests, but because I keep banging on about maximising your opportunities to gain a certificate by entering an appropriate section, I'd like to tell you about what I did two years ago in the CQWW RTTY Contest.

I wanted to take part more as a matter of curiosity than anything else, because I don't have an antenna farm for HF. I didn't relish the thought of trying to stay awake for the best part of a whole weekend, so I decided that a single band entry would be best and, because I didn't want to stay up all night, that single band wouldn't be LF. Of the HF bands I decided 15m would be best, because at the time propagation was mediocre, so the band would be likely to open only for a limited number of hours, all in the daylight. Because conditions weren't predicted to be great I decided to enter the High Power category. In making these decisions I considered the odds were in favour of me being one of few stations in England to enter that category. In my garden I erected a 15m delta loop on a 25ft fibreglass fishing pole. This is a modest antenna. The reason I chose it is that it's the kind of thing that thousands of people should be able to erect, even if only for a weekend. And such an antenna will fit in a tiny garden. The feedpoint of mine was only about 15ft above ground level.

Next, the callsign. Short contest callsigns are legal in CQWW and quicker to send, so I used the short call that belongs to a group I'm a member of. When I heard the band begin to open I started calling CQ. Initially progress was slow, but my rate improved as the band opened more fully. In the afternoon, as expected, activity swung around from east to west. The band closed at 2000Z, by which time I had 247 QSOs in my log. On the Sunday I repeated the exercise, but the band closed at 1800Z, so I only worked 203 more, giving me a total of 450 QSOs. When the results were released I was gratified to discover that my part-time effort with a modest, low-profile antenna had indeed earned me some wallpaper (see **Photo 2**).

CQWW RTTY takes place again this month. For anyone contemplating a serious entry that doesn't require long hours in the shack or incur the XYL's wrath, the temptation might now be to consider a 10m-only entry, but because that band is now in much better shape there is a chance that a lot of others will also opt for it, making the chase for a certificate more difficult. This being so, 15m could once again be the smart choice, because a number of single-band regulars are likely to have abandoned 20m/15m to go to 10m. If I were a night owl, 80m would be the single-band that I would choose, as it isn't open for DX during the day. Low Power on 80m would be a challenge (there is no QRP category), and depending on your DXCC entity you might not need to make many QSOs at all to come top.

All I have written so far has been about single-operator single-band entries. To win in the single-operator all-band category a far more serious setup will be required, because there are invariably some well-equipped, well-sited stations competing. In terms of multi-single, multi-two and multi-multi entries, there exists huge opportunities to come top, because precious few entries are received from Europe in any MS, M2 or MM category.

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Sep 1-2	SSB Field Day	1300-1300	SSB	3.5-28	RS + SN
Sep 12	80m Club Sprint	1900-2000	SSB	3.5	Both calls + SN + name
Sep 27	80m Club Sprint	1900-2000	CW	3.5	Both calls + SN + name

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Sep 1-2	144MHz Trophy +	1400-1400	All	144	RS(T) + SN + Locator
Sep 2	5th 144MHz Backpacker	1100-1500	All	144	RS(T) + SN + Locator
Sep 4	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Sep 9	2nd 70MHz	0900-1200	All	70	RS(T) + SN + Locator
Sep 11	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Sep 18	1.3GHz UKAC	1900-2130	All	1.3	RS(T) + SN + Locator
Sep 25	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Sep 25	SHF UKAC	1900-2130	All	2.3-10G	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Sep 1-2	All Asian DX	0000-2359	SSB	1.8-28	RS + age (YLs send 00)
Sep 1-2	IARU 144MHz	1400-1400	All	144	RS(T) + SN + Locator
Sep 1-2	CW Open	1200-0800	CW	1.8-28	SN + Name (3 separate sessions)
Sep 8-9	WAE DX SSB	0000-2359	SSB	3.5-28	RST + SN (Eu works non-Eu only)
Sep 16	WAB 144MHz QRO Phone	1000-1400	SSB/FM	144	RS + SN + WAB square
Sep 23	PW 70MHz	1200-1600	All	70	RS(T) + SN + Locator
Sep 23	BARTG Sprint 75	1700-2100	RTTY	3.5-28	SN
Sep 29-30	CQWW RTTY DX	0000-2359	RTTY	3.5-28	RST + Zone (UK=14)
Sep 30	UKuG Cumulatives	1000-1600	All	5.7, 10, 24G	RS(T) + SN + Locator

+VHF Championship event.
For all the latest RSGB contest information and results, visit www.rsgbcc.org.

THIS MONTH'S EVENTS. HF contesting begins with the ever-popular SSB Field Day. Participants have 24 hours in which to make as many QSOs as possible, taking in as many countries as they can. There are Open and Restricted categories. After that it's the second month of this year's 80m Club Sprint series. The use of modes is reversed this month, so it's SSB first on Wednesday 12th, followed by CW on Thursday 27th.

The 144MHz Trophy Contest takes place for 24 hours on the 1st – 2nd. It is hotly contested in the Open category, but there are four other categories and three of them are for single ops, so there are opportunities for all to strive to do well. Overlapping the last three hours of the 144MHz Trophy Contest (and then continuing for one hour on its own), the fifth and final 144MHz Backpacker contest takes place on Sunday 2nd. In the Backpackers there are two permitted power levels, 3W and 10W. We stay with 2m for the first of this month's UKACs on the 4th. The Second 70MHz Contest on Sunday 9th is one which has certainly enjoyed much greater participation in recent times, although it seems to have reached a plateau in the last three years. We return to the UKACs for the remainder of the month, with 70cm on the 11th, 23cm on the 18th and 6m and SHF on the 25th.

As we enter the autumn there are lots of international contests, the first being the All Asian DX SSB that takes place for the entire 48 hours of the 1st and 2nd. The exchange in this event is quite different to the exchange in SSB Field Day (with which it coincides), so it can be handy for those teams taking part in SSB Field Day to have a suitable exchange at hand (perhaps the average age of those present) to give to All Asian participants. Next, two more coinciding contests. The IARU 144MHz Contest takes place at exactly the same time as the RSGB 144MHz Trophy. The exchange in these are the same and all those who submit a log for the RSGB event will be automatically entered for the IARU event, unless they specify otherwise. The CW Open is a new event run by the American-based CW Operators' Club. On the weekend of 1st – 2nd it consists of three 4-hour sessions, spread over the course of twenty hours. The sessions are adjudicated separately, so you don't have to enter all three, you can work the same stations in each session and you can work singly or as a member of a team. Next, on the 8th – 9th, comes the SSB leg of the Worked All Europe Contest. The CW leg took place last month, so please refer to my August column for more info. Moving on to the 16th, the Worked All Britain 144MHz QRO Contest runs for four hours. Part of the exchange is WAB 'square', which is the first, second, third and sixth digits of the 8-figure National Grid Reference of your QTH.


CQ
The Radio Amateur's Journal
Takes pleasure in awarding this Certificate of Merit to
MØB (OP: G3ZVW)
In Recognition of your participation in the 2010
World Wide RTTY DX Contest
for the ENGLAND category
1ST PLACE HIGH POWER RTTY SINGLE OPERATOR - 15 METERS
A Total score of 140298 was computed on a basis of
contact points and state/Canadian area/country multipliers and CQ
zones. In witness of this achievement, we hereby affix our signatures.
#16 WORLD #10 EUROPE
Ed Muns, WØYK

PHOTO 2: My 'wallpaper' from the 2010 CQWW RTTY Contest.

This contest has several sections, but last year there were no entries in most of them, which makes for some easy wallpaper potential. On Sunday 23rd the Practical Wireless 70MHz Contest has Low Power (10 watts) and Open sections. Scoring is 1 point per contact, multiplied by the number of Locator squares worked. The BARTG Sprint 75 takes place on the same day. Available sections are Single Operator Expert (ie anyone who has come in the Top 10 in any BARTG contest in the past three years), and Single Operator All Band. The final weekend of the month brings the CQWW DX Contest. This month it's RTTY, and it runs for the whole 48 hours of 29 – 30th. The final event is the UKuG Cumulatives, which take place on 5.7 – 24GHz for six hours on Sunday 30th.

ARDF

Preview of the World ARDF Championships 2012

YOUR RSGB
ARDF: DEDICATED TO DF HUNTING

Robert Vickers, G3ORI who is a medal contender in the M70 team events at the 16th World ARDF Championships in Serbia this month.

PODIUM PROSPECTS. September sees the staging of the 16th World ARDF Championships in Serbia and this month we look at the prospects for the RSGB team. Several members of the RSGB team from the last World Championships, held in Croatia in 2010, have moved up to an older age group and this materially alters the likelihood of some success in Serbia. All age group changes take place on 1 January of the year in which a competitor attains the new age. For example, someone born on 20 December 1972 became an M/W40 on 1 January 2012 and thus competes as an M/W40 for nearly 12 months whilst aged 39.

ARDF, using the IARU rules, first started in the UK in 2002 and since then the RSGB has never achieved a podium place at international level. We have had good performances, for example John Marriott was 6th in M60 in the 144MHz race of 2010 and our M40 team in the Region 1 Championships held last year managed 4th place. One hopes we will not have to wait quite as long as the cyclists waited to get a winner of the Tour de France – and there are some reasons for optimism.

We still have a competitive M40 team and, on his day, Andrew, G4KWQ can be a serious challenger. He might find it hard to get on the podium as an individual but the team possibilities are still there.

David Williams has moved into M50 this year and, after coming 8th in the 80m individual race in Korea back in 2008, his chances for individual honours look reasonable. He will enjoy being at the lowest end of his new age group and this gives him an edge to exploit.

The RSGB will have an M70 team for the first time this year, in the form of G3ORI and G3ORY. This pair are closely matched in ability and there is a possibility here of some team success. The competition is nothing like as fierce in this category as it is for the younger male categories.

MORE RACES. This World Championships will see a broadening of the competition. Traditionally there have been two races with up to five transmitters in each one. One race has been on 144MHz and the other on 3.5MHz. In 2012 the Sprint format and FoxOring will be added to the programme. Hence there will be four competitions in which the RSGB could make it into the top three places.

The sprint format uses two groups of five transmitters sending for just 12 seconds each in a one minute cycle on the 3.5MHz band. The two groups of transmitters are on different frequencies and there is a spectator beacon to be visited at the change over point. The format is fast and furious and takes quite a bit of familiarisation to become proficient.

FoxOring is a blend of orienteering and ARDF. There are circles on the map denoting the approximate location of the transmitters. The competitor has to navigate to the circle where a very, very low power 3.5MHz transmitter can be heard and then located using normal direction finding methods.

The four competitions take place on 12 – 15 September and there is likely to be a live download to the web of the results as they come in. Check out the competition website at www.ardf2012.org. The DARC website also carries daily information – see http://ardf.darc.de/english.htm.

There are few opportunities for truly fair radio sport events. The WRTC contesting event, next scheduled for 2014 in the USA, achieves this for contesting with teams in a common location with identical antennas and supervised by a referee throughout. The IARU High Speed Telegraphy competition also achieves the same high level of fairness in radio sport as WRTC and ARDF. In 2012, this event takes place in Switzerland during October.

INTERNATIONAL CLASS REFEREE. Vlad Boev, 2E0VLB has been appointed by the IARU as the first International Class ARDF referee from the RSGB. Vlad started competing at ARDF in his native Bulgaria over 40 years ago and has the required qualifications to be a referee of this standing. Experience at planning and organising high level competitions, ability to communicate in a number of languages and being able to move around the competition area quickly are all required in this role. Vlad now lives in Surrey and is an active participant in the RSGB domestic ARDF calendar.

Vlad Boev, 2E0VLB pictured holding his certificate of office as an International Class Referee for ARDF.

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MWNW	My Father, the Man Who Never Was	£9.95	**£8.46**
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CAPE	Capturing Enigma	£8.99	**£6.74**
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HAPO	Haynes Manual for Apollo 11	£19.99	**£16.99**
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PTCG	Perera's Telegraph Collectors Guide	£9.99	**£8.49**
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TSOE	The Story of Enigma (CD)	£9.99	**£8.49**
TCCD	Perera's Telegraph Collectors CD	£9.99	**£8.49**
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USG4	radiotoday - Ultimate Scanning Guide	£19.99	£16.99
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IMD5	Intermediate Licence Book	£6.99	**£5.24**
ADVA	Advance! The Full Licence Manual	£11.99	**£8.99**
IEXM	International Amateur Radio Exam Manual	£14.99	**£11.24**
LOW FREQUENCY			
LFT2	LF Today 2nd Edition	£12.99	**£11.04**

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HF F-Layer Propagation Predictions for September 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	82.....778	87.....27888	.5.223568885	..76777886..	..6899998...	...678877...	.....	.....
*** Asia								
Yakutsk	.....	.....54.	.3.....47777	..665667544.	...666.....	....7.....	.....	.....
Tokyo	.....3..	.....378..	.....24..	.....	.....	.....	....5.....	.....
Singapôre	.....22.	48872	.....4652.	.....55...	.....565...	.....4....	.....	.....
Hyderabad	.....	2544	6654	.....465..	.....55...	.....4....	.....	.....
Tel Aviv	98.....6889	995....29999	..5....3887.	...3..3674..	...666677...	.....45....	.....	.....
*** Oceania								
Wellington	.....	.....4...	.....5...	.....	.....	.....	.....	.....
Well (ZL) (LP)	.....	..6.....	..6.....	..5.....	.....	.....	.....	.....
Perth	.....	.....433.	.....6765.	.....65...	.....	.....	.....	.....
Sydney	.....	.....477..	.....2777..	.....6645..	.....	.....	.....	.....
Melbourne (LP)	.....	..89.....	37994.....	77797.....5	...97.....65	...8.....6.	.....	.....
Honolulu	.....	.....	..563.....	...45.....	....4.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....5...	.....	.....	.....	.....
W. Samoa	.....	.....	..564.....	...5665.....	....666.....	....555.....	.....	.....
*** Africa								
Mauritius	2.....222	7.....7887	6.....48887	78864	.....45...	.....	.....	.....
Johanesburg	.....	35.....1565	57.....8988	9875	.....587..	.....586..	.....46...	.....4...
Ibadan	.1.....	66.....456	676.....3676	.37.....676.	..66...578..	...7444788..	...7...785..	.....56...
Nairobi	2.....1	76.....3777	55.....3455	5663	..4....566..	.....3564..	...655677...	.....
Canary Isles	665.....666	878.....888	8866....6888	738753467887	...69899898.	....999999..	....887786..	....66557...
*** S. America								
Buenos Aires	.....	535.....3	7672.....77	4.33.....364	.....5..	.....4..	.....	.....
Rio de Janeiro	.....	545.....45	878.....788	5.5.....875	.....73.	.....6..	.....	.....
Lima	.....	433.....2	7667.....57	3..6.....63	.....	.....	.....	.....
Caracas	.....	433.....3	8886.....78	5..75....587	....75.3575.	....665567..	.....54.64..	.....
*** N. America								
Guatemala	.....	322.....	7667.....7	...5.....33	.....	.....	.....	.....
New Orleans	22.....	666.....4	7675.....6	.....5.	.....	.....	.....	.....
Washington	342.....	7772.....6	7886.....47	....3....475	.....4..	.....4.455..	.....	.....
Quebec	66.....5	776.....67	3..4.....367	....3..356..	.....	.....	.....	.....
Anchorage	.....	.....	44543.....35	.....6666.	.....67..	.....6..	.....	.....
Vancouver	.....	.3.....	.....	.....	.....55..	.....	.....	.....
San Francisco	.....	.22.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....4....	.....5....	.....5....	.....5....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong. The RSGB Propagation Studies Committee provides propagation predictions on the internet at **www.rsgb.org.uk/propagation/index.php**. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for September, October & November are respectively (SIDC classical method – Waldmeier's standard 63, 65 & 67 and (combined method) 84, 86 & 88. The provisional mean sunspot number for July was 66.5. The daily maximum / minimum numbers were 97 on 7 July and 19 on 21 & 22 July.

RadCom

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 October 2012 *RadCom* is 24 August and for the November edition it's 1 October. 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

No listings received.

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, RM1@RSGB.ORG.UK

AYR ARG
Tom Ferguson, GM1OST, 01292 532 088
5 Bring and Buy sale / group programme discussion
19 Debrief from Ayr Flower Show and ILLW weekend

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723, www.cpsarc.com
7 Normal club night
28 Second 144MHz DF hunt, meet in The Old Ship Inn car park (east)

LIVINGSTON & DARS
Norman, GM1CNH, 07740 946 192, uk.groups.yahoo/group/ms0liv
4, 18 Club evening
11 Operating evening
25 Morse code practice

LOTHIANS RS
Alan J Masson, GM3PSP, 0131 623 4580, alanjmasson@virginmedia.com
12 Amateur radio in Japan by Vic, JA5VQ
26 Visit to Museum of Communication, Burntisland; talk on marine communication by Prof Tom Stevenson

WIGTOWNSHIRE ARC
Ellis Gaston, GM0HPK, 07979 692 580
20 AGM

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

ABERDEEN ARS
Fred Gordon MM0ODL, 01975 651 365
1 RSGB SSB Field Day - Walker Park, Aberdeen
6 Junk sale

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
3 Heavens Above - astronomy projects for the amateur, Ross, G6GVI
17 A chance encounter that led to the Shetland Isles, Elaine, 2E1BVS

CHESTER & DRS
Bruce Sutherland, M0CVP, 01244 343 825
4 Talk on operating procedure
11 Committee meeting
18 Surplus sale
25 Club station on the air

MORECAMBE BAY ARS
Sheila, 07867 516 836, sssmith456@btinternet.com
4 Talk on homebrew antennas by Ken Hough
11 Radio doctor night with Bob, G3VVT
18 HF & 70cm night
25 Talk on building a data mode interface

SOUTH MANCHESTER R&CC
Ron, G3SVW, 01619 693 999
1 Weekend event: 2m Trophy
6 Post-expedition report by Ron, G3SVW
13 Digital modes talk by Terry, G6CRF
20 Surplus equipment sale
24 Monthly technical forum
27 Talk on Alan Turing by Dave, G4UGM

WORKINGTON & D AR&IT GROUP
Barry Easdon, G0RZI, 01946 812 092, barrydrm31@hotmail.co.uk
10 Club meeting and social evening
24 An update on software defined radio by Kevin, M0KHZ

The youngest person in the UK to have achieved Mountain Goat status in the Summits on the Air awards programme is Jimmy, M3EYP. Jimmy (19), from Macclesfield in Cheshire, started trekking up the hills with his dad Tom, M1EYP back in 2002 when he was 10 years old, and quickly developed an interest in hillwalking and amateur radio. In six and a half years in the SOTA programme, Jimmy has amassed the 1000 points required for Mountain Goat status, the single most sought-after award in the scheme. Shortly after the Mountain Goat triumph, Jimmy was successful in his Intermediate examination after another course with the **Macclesfield & DARS**. He expresses his thanks to the instructor at the club, Brian, M0GOB. Also successful at the same sitting was Mike, 2E0CKK.

Not exactly our most successful NFD says **Mid Cheshire ARS**, and not just because of the weather, although it started that way on Friday afternoon when they were nearly flooded out, which is difficult to achieve on top of a hill! The heavens opened up and just getting onto site entailed an interesting operation. The equipment van had to be towed into the field by a Land Rover, which had to be towed by a Range Rover!

Saturday morning was somewhat better, with clouds but no rain and even the odd ray of sun to cheer them up, but the race to have all four stations ready for the 1400GMT start was not helped by the previous day's rain and also by a few logistical and technical problems, particularly with the 70cm setup, which finally got going a couple of hours late. Shortly after they had 70cm sorted out and an excellent curry dinner eaten in preparation for a good night's contesting, the main generator suffered a terminal failure, leaving them without power. The catering generator came to the rescue, but was only man enough to power the 2m station. So after a night's sleep under canvas, they started packing up early on Sunday morning and were off site by lunchtime. Despite the troubles though, they had a thoroughly good time, which is what it should be all about!

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
1 Weekend event: HF Contest in Windmill Hills school field
3 On the air; Advanced course continues
10 Talk on UHF and wind farms at 7-30 by Ed Aksamit
17 Rally preparation
18 Amateur radio training with Girls Brigade
22 Fog on the Tyne Rally
23 22nd Great Northern Rally
24 Round up from rally; Advanced course continues

DENBY DALE RC
Richard, M0RBG, 07976 220 126, m0rbg@talktalk.net
5 Microwave radio - fact & fiction talk, including some experiments, by Gary Whittaker, M1EGI
12, 26 Night on the air from 1930 on 145.575MHz ±
19 Club night

GOOLE R&ES
Ken, G6YYN,
01757 638 539,
rpsmail73@btinternet.com
1 On the air and antenna test session
19 Contest planning evening
26 Dish antenna update by Steve, G8VHL

SHEFFIELD ARC
Peter Day, G3PHO,
sarc@g3pho.org.uk
1 RSGB SSB Field Day & 144MHz Trophy Contest: SARC contest station G2AS/P (HF), G3RCM/P (2m)
3 Talk: operating in the 2012 RSGB Commonwealth Contest from Malta by Peter, G3PHO (9H3C)
10 Caravan portable talk by David Littlewood, G6DCT
17 SARC 2012 contest review - a look back on this year's efforts

TYNEMOUTH AMATEUR RADIO CLUB
Bob, M6KLO,
mail@g0nwm.com
8 Weekend event: Work All Europe Contest (SSB), operating as G5N

Keighley ARS would like to congratulate Etienne, 2E0ZAS, Shirley, 2E0SJK and Barry Mcglynn who have all passed their Intermediate exam.

Axholme Radio Club's Shack Manager, David Cowling, has just passed his Full licence and is now M0HDV. He is pictured (left) receiving his certificate from Club Chairman Brian Spittlehouse, G7IMD, at a dinner to mark the occasion. The Club is setting up a radio station and display at a local major agricultural show in the Isle of Axholme – The Festival of the Plough on 16 September.

700 pupils from Newcastle High Schools took part in the 'Big Bang North East', National Science and Engineering Competition at Newcastle University. To help celebrate the event and inspire the pupils, **Northumbria ARC** ran a Radio Technology Workshop on campus with callsign GB2BB. With the theme 'Exploring Communication Technologies Old and New', the pupils were able to participate in two-way communications on both HF and D Star Internet Radio. A comparison between mobile phone texting and hand sent Morse code lead on to the pupils sending a short message in Morse code.

George, M3VBP, a member of **Denby Dale ARS** is delighted to have passed the Intermediate exam. Here is George proudly holding his certificate and eagerly awaiting his new 2E0 callsign.

REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, M0VRR, RM5@RSGB.ORG.UK

ALDRIDGE & BARR BEACON ARC
Albert, G0KFS, 01922 614 169
3 Computers in radio
17 On the air

BROMSGROVE & DARC
Chris, M0BQE, 01905 776 869,
g3vgg@hotmail.com
7 K2 update
14 VHF night
21 Committee meeting
28 HF night

CENTRAL RADIO AMATEUR CIRCLE
Martin Hallard, G1TYV,
radio-circle@live.co.uk
2 Group visit to Telford Hamfest
6, 13, 27 Night on the air – 145.300MHz from 2000
11, 18, 25 Intermediate course via Skype (MX0PPC)
14 3-day event :Transmission 2012, for BWFB
15 Weekend event: Black Country Boating Festival
20 Circle meeting, Turf Tavern, Wolverhampton Road, Bloxwich WS3 2EZ
28 Group visit to Newark Hamfest
29 Plug and Play Day, Barr Beacon, Beacon Road, Walsall, from 1000 onwards

CHELTENHAM ARA
Derek Thom, G3NKS,
01242 241 099,
treasurer@caranet.co.uk
20 Measuring SSB linearity & power by Robert, G4VCL

COVENTRY ARS
John, G8SEQ, 07958 777 363
7 T32 Kirimati 2011 DXpedition
14 4th round G2FDC Trophy
21 Quiz night
28 Radio workshop

GLOUCESTER AR&ES
Anne, 2E1GKY,
01452 548 478, daytime,
www.g4aym.org.uk
1 SSB Field Day
10 AGM

MIDLAND ARS
Norman, G8BHE,
07808 078 003
2 Visit to the Telford Hamfest
5 Open meeting, shack on the air and training classes
12 Committee meeting and training classes
19 General meeting and training class
26 Review of club equipment and training classes

SALOP ARS
www.salop-ars.org.uk
6 Natter night and committee meeting
13 Construction contest
23 Natter night
30 Talk on making TV shows by Tom, M6IDT

SOUTH BIRMINGHAM RS
Don, 01214 581 603,
www.radioclubs.net/southbirmingham
2 Club stand at the Telford Hamfest
3 Unpacking trailer and rally debrief
5 Lecture in the main hall and Morse class
6, 13, 20, 27 Training classes with Dave Murphy, G8OWL
7, 14, 21, 28 Shack and aerial work
17 Committee meeting
29 Visit to National Hamfest

TELFORD & DARS
Mike, G3JKX,
01952 299 677,
mjstreetg3jkx@blueyonder.co.uk
2 Telford Hamfest
5 Committee meeting; GX3ZME OTA HF/2m
12 Hamfest & /P debriefings
19 Come with your ideas - what does TDARS need to buy?

Cotswold Amateur Radio Group based near Stroud in Gloucestershire is pleased to announce that three members passed the Advanced exam. Pictured are Andy, M0WBA, Peter, M0IND, course tutor Roger, G3REB and Ian, M0IRD - congratulations to all three candidates. Once again many thanks to course tutor Roger, G3REB for giving up his time to run the exam course.

12 year old Daniel Humphries, a Year 7 student at the Co-operative Academy of Stoke-on-Trent in Tunstall, has become the latest pupil from the school to gain an amateur radio transmitting licence. Daniel has been studying a Foundation course throughout his first year at the Academy, during the Friday afternoon 'curriculum enrichment' lessons. The course is run by Head of Mathematics Tom Read who himself holds amateur radio callsign M1EYP.

Daniel now has the callsign M6HCD. The course has been well-supported by local amateurs in Stoke-on-Trent, as well as some of Tom's contacts

within the Summits on the Air (SOTA) awards programme, and this has provided for much of the radio equipment in use. Daniel now has use of a Wouxun 2m handheld transceiver to kick off his radio amateur hobby, this being one of the radios donated to the project by benevolent amateurs.

Daniel Humphries M6HCD, and course tutor Tom Read M1EYP.

The **Central Radio Amateur Circle** was formed in February 2012, by a small group of 4. The idea was to form a radio group who wanted to play radio. After the first month it was decided to apply for a callsign for the group, MX0PPC, for their plug and play days. They then set up our website www.radioclubs.net/crac, which has proved to be very popular. Last was raising the funds to join the RSGB, which they did. After the first 6 months they now have 60 plus members and are active on VHF most Thursday nights from around 8pm on 145.375MHz. All are welcome to call in.

Five operators will be on the air from Tiree, EU-008, from 13 to 20 September on 6 to 160m SSB, CW and RTTY. The operators want to give every amateur the opportunity to work Tiree for the IOTA marathon. QSL via M0URX OQRS, LOTW and eQSL. Log search powered by *Clublog*. http://ms0oxe.webs.com/.

Telford & DARS are once again organising a HamFest at the popular Enginuity site in Telford. The date is 2 September and the event opens at 10.30am. Alongside the usual traders and specialist stands and exhibitors, an award-winning speaker, Stuart Wisher, G8CYW, has been invited to give a presentation and demonstration of some of his optical communication experiments, which have featured in the May and June editions of *RadCom*. Perhaps not so well known is the fact that an Ofcom licence is not required to undertake these experiments, both receive and transmit. In some respects, the techniques employed hark back to the early days of radio experimentation, where simple apparatus can be used in ways not envisaged by such retailers as 'Poundland' who are a source of cheap lenses in this particular application! A very warm welcome is guaranteed for everyone who comes along to this popular event. Further details from Martyn, G3UKV on 01952 255416 or via the website www.telfordhamfest.co.uk.

REGION 6: NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620 733
3 Contests as a learning tool talk by GW0ETF
17 Mountain rescue talk by MW6BKS

WREXHAM ARS
Carl Morris, MW0TBB, tydraig@wrexham-ars.co.uk
18 The life story of a tellymender

REGION 7: SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, RM7@RSGB.ORG.UK

ABERYSTWYTH & DARS
Ray, GW7AGG, 01970 611 853, ray@clocktower.go-plus.net
1 Across Wales Walk
27 Club night on the air on 145.500 then 145.550

CARMARTHEN ARS
Lloyd, 2W0LLT, 01239 711 297, 2W0LLT@talktalk.net
4 On the air night, GB3FG
18 Open night

Carmarthen ARC had an open meeting recently when members were able to see the new equipment for repeater GB4FG. Left to right is Chris, GW4DGU, Peter, GW4JQP and Trevor, GW4RVA.

REGION 8: NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, RM8@RSGB.ORG.UK

No listings received.

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

BROMLEY & DARS
Andy, G4WGZ, 01689 878 089
8 Foundation course day 1
18 Digital Amateur TV by Justin, G8YTZ
22 Foundation course day 2

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
17 75th Anniversary open evening

CHESHAM & DARS
Terry, G0VFW, 01442 831 491, cdars.club@ntlworld.com
1 Weekend event: RSGB HF SSB Field Day
5 General meeting
12 Members forum – bring along your radio equipment
19 Discussing a technical topic
26 Night on the air & club net via GB3VA & GB3AL

CRAY VALLEY RS
Malcolm Bryan, G8MCA, 07906 433 965
6 Health & Safety for the radio amateur by Dave, M0BGR
20 One man DXpeditions talk by Nobby, G0VJG

CRYSTAL PALACE R&EC
Bob, G3OOU, 01737 552 170, g3oou@aol.com
7 An evening of short talks

DORKING & DRS
Garth, G3NPC, 01737 359 472, www.ddrs.org.uk
25 Talk on the Sun and HF radio propagation by Dr Colin Forsyth of MSSL

EDGWARE & DRS
Mike, G4RNW, 02089 500 658, michael.stewart5@ntlworld.com
13 How to spend a Tuesday evening getting involved with a short contest run by the RSGB
27 What you can do in thirty minutes - short bursts of operating in between chores and other activities

NEWBURY & DARS
Rob, G4LMW, 01635 862 737, g4lmw@btconnect.com
26 Weekend event: special event station GB4CBE at Crofton Beam Engines for Pumping Stations on the Air

RADIO SOCIETY OF HARROW
Linda, G7RJL, 02083 868 586, www.g3efx.org.uk
14 Surplus equipment sale
15 GX3EFX/P at Pinner Village Fair
28 Talk

READING & DARC
Pete, G8FRC, 01189 695 697
13 Liquefied Natural Gas talk by John Turner

SHEFFORD & DARS
John Burnett, M6JBU, 07860 804 793
13 What did you do in the holidays?
20 WiNRADiO talk by Richard Hillier, General Manager, Radixon (provisional)
27 Visit to Duxford ARC – 1930 start time

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
12 The Great ERG Race
29 Weekend event: Railways on the Air at GB0TLR

STEVENAGE & DARS
Martin Juhe, M0XJP, 07973 793 770, m0xjp@mjdesignprint.com
4 Club project - LC meter
11 Members operating night
18 Slim Jim talk and demo by G4KGP
25 DXpedition film night – BS7H, 3B7C & T32C

SURREY RADIO CONTACT CLUB
John, G3MCX, 020 8688 3322, secretary@g3src.org.uk
3 Cryptanalysis by Peter, G3ZPB
17 Club natter and fix-it night

SUTTON & CHEAM RS
Darren, M0PRV, 07525 753 702, info@scrs.org.uk
20 Talk on the MKARS HF SDR receiver kit by Steve Drury, G6ALU, from Milton Keynes Amateur Radio Society

VERULAM ARC
Ralph, G1BSZ,
01923 265 572, g1bsz@aol.com
13 Social with GB3VH repeater group, 7.30pm, Rose and Crown Pub, Sandridge
18 Talk and demo by Middlesex University Robotics Dept who scored top marks at international drone competition

WIMBLEDON & DARS
Andrew Maish G4ADM,
020 8335 3434
14 Summer Camp retrospective
28 Australian radio evening by Dick Shanahan

Verulam ARC was pleased to invite Regional Manager Alison, G8ROG, to talk to its members at its July meeting. Alison's talk was on the history of the RSGB, its present situation and its vision and plans for the future; a subject of much interest to VARC's members. The second half of her talk was on the new National Radio Centre, located at Bletchley Park because of the role radio amateurs played during the second World War in providing Bletchley Park with intercepts of enemy radio traffic, which made a significant contribution to the war effort.

Reading & DARC is pleased to announce that on Thursday 27 September it will be hosting a special, not to be missed, talk entitled The Sun by celebrity Solar Physicist Dr Lucie Green of the Mullard Space Science Laboratory. The event, open to all, will be held at Reading University. This is not their normal venue and consequently will be able to accommodate more visitors, over and above club members. However, registration is recommended, so visit www.radarc.org for fuller details. There are 10 pages of information about Dr Green and her research on the RADARC website and if you searched the internet you could find more!

A Foundation licence course was held at the **London Hackspace**. Four took the exam and all four passed with excellent marks. Dominic, M0DLX, the instructor, hopes to hear them on the air soon. They hope to run another Foundation course in the near future. More details about the group on the website https://london.hackspace.org.uk/.

Dorking & DRS has a close relationship with the National Trust, where, by arrangement, members are allowed to operate portable from Leith Hill, the highest point in Surrey. The club has now extended its association and will be participating with the National Trust's Open Day at another property, the renowned Polesden Lacey House, near Leatherhead. It will be operating a station from the grounds on Saturday 8 September, when admission to all Trust properties in England & Wales is free, and when over one thousand visitors are expected at Polesden. The Society will also be active on Sunday 9 September, using the callsign GB0NT on both days. The club found that the Trust warmly welcomed its offer to demonstrate amateur radio over that weekend and full cooperation is being given in planning the event. The Trust will supply two marquees: one for use by operators of the HF station, and another where old domestic receivers from the 1920s and 1930s can be exhibited.

REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

BREDE STEAM ARS
Steve, 01424 720 815,
MONUC@aol.com
1 SSB Field Day
4, 11, 18, 25 At the shack
7 Weekend event: Churches on the Air – Brede Church

HARWELL ARS
Malcolm, G8NRP,
01235 524 844,
info@g3pia.org.uk
8 Annual summer barbecue
11 Members natter night
25 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909,
www.herc.uk.net
26 Talk at the Taplin Centre on medical electronics by Steve Balkam

HORNDEAN & DARC
Stuart, G0FYX,
023 9247 2846,
www.hdarc.co.uk
6 Natter night/social evening
20 Fuses talk by Hugh Rooms, M1ETU

MID-SUSSEX ARS
Rob, 2E0RJA,
01444 232 129,
2e0rja@msars.org.uk
2 Radio night and post-event equipment check
7 Talk by Sussex Lowland Search and Rescue team
14 Radio night and equipment testing for Railways weekend
21 Talk by John Narborough on Victorian and Edwardian electro-medical machines (with demonstrations)
28 Equipment sorting for Railways weekend
29 Railways on the Air weekend

SOUTHDOWN ARS
John, G3DQY,
01424 424 319
3 Talk at Chaseley
5 Operating at Hailsham shack

SWINDON & DARC
Den, M0ACM,
07810 317 750,
www.sdarc.net
6, 20 Talk
13, 27 Activity night

TROWBRIDGE & DARC
Ian, G0GRI,
01225 864 698, E/W
19 Natter night

WORTHING & DARC
John, G8FMJ,
01273 593 232
1 Weekend event: SSB Field Day contest
5 How to reach the top in SOTA – a talk by Bob, G3VXJ
12 80m SSB Sprint contest
19 Annual club construction contest
26 GX3WOR on the air
27 80m CW Sprint contest

In July the **Waterside New Forest Radio Club** held its traditional annual HF picnic at Yew Tree Heath in the New Forest. Yew Tree Heath was used for anti-aircraft defence purposes during WWII but it also provides a useful base for present-day amateur radio activities, with a flat open area, and adjacent car-parking facilities. The annual picnic provides an opportunity for club members and their friends and families to meet in the beautiful New Forest countryside, to set up radio stations, often experimental, in an open-air field setting, and, just as important, to socialise and exchange information.

This year the threatening weather forecast restricted both attendance and the variety of activities somewhat, but a number of resolute members and their friends set up the station successfully and enjoyed the opportunity to socialise during the afternoon.

The club site consisted this year of the club tent, delivered by Gordon, G1ZEC and various vehicles in the nearby parking spaces. Tim, G4YVY and Tony, G6MNL set up the club radio station (callsign G4JYN), which consisted of an FT-757 GX II HF transceiver feeding into a G5RV aerial oriented roughly north – south. Tony and Bob also experimented outside the tent with a 'screwdriver' aerial and a home-built HF receiver, when weather permitted.

Two members of staff and one student were successful in their Intermediate exams recently.

Darren Turnbull of the National Diploma Engineering course, and Chris Smith and Mick Shepherd, both of the Mechatronics Department staff sat the paper in June. In the photo, from left, are Dave, G4HUP, Instructor, Mick, 2E0CNE, Chris, 2E0CNG and Darren, M6BKM. Darren was only at the College for the one year and completed both his Foundation and Intermediate level radio qualifications in that time, as well as his formal course.

Horndean & DARC was delighted to be asked by the Worked All Britain group to run their club callsign GX4WAB for the Follow the Torch event. They operated for Day 59 (16 July) from WAB square SU60 at Fort Widley on Portsdown Hill, overlooking the City of Portsmouth. The weather was bad with continuous rain for much of the day, but they kept dry in their caravan. Despite poor band conditions they managed to make 275 contacts on HF (80m and 40m) and a further 73 contacts on 2m FM. They enjoyed the long day.

John, G4WQZ, operating the GX4WAB Day 59 HF station.

REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473 251
8 Arlington Court special event station for the National Trust
17 Back to basics - HF propagation talk by Terry, G4CHD

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420 442
24 3DA0PW Swaziland talk by Phil Whitchurch, G3SWH

CORNISH RADIO AMATEUR CLUB
Steve, G7VOH, 01209 844 939, G7VOH@btinternet.com
5 Committee meeting
6 Main club meeting
20 Workshop evening

EXETER ARS
Nick, 2E0NRJ, 01363 775 756, info@exeterars.co.uk
3, 17 HF net on 3,675kHz at 19:45
4, 11, 18, 25 2m net on 145.575 MHz at 19:45
6, 13, 20, 27 Thursday 4m net on 70.425 MHz at 19:00
10 Amateur radio video night in Moose Centre at 19:00
24 Designing my dream shack in Moose Centre at 19:00

PLYMOUTH RC
Rob James 2E0ONO, Robert-james@virginmedia.com
11 Advanced Repeater and Echolink use by Chris Parker, M0ZCP

RIVIERA ARC
Alan Wyatt, G2DXU, rivieraarc@gmail.com
3, 17 Club night
10, 24 Portable RV

TAUNTON & DARC
Peter Robinson, G0EYR, 07811 635 819
5 Visit to GB2NLO at the Norman Lockyer Observatory, Sidmouth

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417 048, tonytsgarc@btinternet.com
5 Eddystone radio restoration, Mike, M1DPB
12, 26 On the air
19 Bring in your project / project surgery

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
7, 14, 21 TARS 80m net
28 A talk by Tony, 2E0CKY on his role as a Paramedic

Yeovil ARC has moved to new premises. The new venue is Abbey Community Centre, The Forum, Abbey Manor Park, Yeovil, Somerset BA21 3TL.

Following discussions with their site manager, **South Bristol ARC** decided to cancel their entry into this year's VHF National Field Day in the light of conditions. The prolonged wet spell that affected most of the country resulted on the wettest June on record. After visiting, the club decided that even if they were able to get cars and caravans onto the site they wouldn't get them off again and the damage they would do to the field would be considerable. They'll be back next year!

REGION 12: EAST & EAST ANGLIA

REGIONAL REP: MARK SANDERSON, M0IEO, RM12@RSGB.ORG.UK

BRAINTREE & DARS
John, M5AJB, 01787 460 947
3 Talk on scanning by Howard, G6LXK
17 Natter night

BREDHURST RECEIVING AND TRANSMITTING SOCIETY
Charles G4VSZ, 07982 244 788, secretary@brats-qth.org
6, 13 Club night with CW practice 08:30 - 09:00pm
20 Coilless VFO talk by G8JAD
27 Open forum with RSGB rep visiting the club

CAMBRIDGE & DARC
Ron, G3KBR, 01223 501 712
14 Junk sale
28 Talk: the Dark Arts, John, M0JWS

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008, www.g0mwt.org.uk
4 Practical antennas by CARS members
30 GB100MWT at Sandford Mill Science and Discovery Day Museum - public open day, free admittance and parking

DARENTH VALLEY RADIO SOCIETY
Bob, M0RAW, 01322 663804, m0raw-bob@talktalk.net
1 Weekend event: HF Field Day
12 On the air and natter night
27 Coastal Navigation talk by Mike, G8AXA

EAST KENT RS
Karl Davies, M1DFM, 01227 710 120, karl.davies@talk21.com
3 Holiday photos evening
17 Portable aerials talk by Karl, M1DFM
23 Stelling Minnis meeting and picnic

HAVERING & DARC
John, M0UKD, 07890 222 111, john@m0ukd.com
5 Operating in St Lucia talk by Jonathon Mitchener, G0DVJ
12, 26 Informal club evening
19 Radio mesh talk by Howard, G8DXV

HUNTINGDONSHIRE ARS
David Leech, G7DIU, 01480 431 333, david.leech1@ntlworld.com
13 Annual rally results
22 Railways on the Air weekend from Nene Valley Railway
27 Hardware for PSK operation by M0VTG

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC, 020 8502 1645
1 Second Aylmers Farm field-weekend: final activation of the club's 50th anniversary callsign GB50LR
29 Railways on the Air weekend

NORFOLK ARC
Chris Danby, G0DWV, 01603 898 678, cmdanby@btinternet.com
1 Weekend event: RSGB SSB FD. This event is to be

held at DCP neat Gt Ellingham and will coincide with Radio Active. This is a fun and educational weekend of events at DCP. Talks and hands-on workshops. RadioActive 9am Saturday - 4pm Sunday

5 Club forum: your chance to offer a talk or suggest a talk that you would like to hear

12 The FT5XO Kerguelen DXpedition – the DX trip with a bit of everything – talk by Mark Haynes, M0DXR

19 Club quiz. bring your own question along for the list

22 Railways on the Air weekend at North Norfolk Railways stations in conjunction with the Bittern DX Group

26 Informal meeting, Bright Sparks Club shack open, Workshop available – please email David, G7URP if you require tools etc

SOUTH ESSEX ARS
Dave, G4UVJ,
01268 697 978,
g4uvj@btinternet.com

11 Talk by Dave, G4UVJ: what is amateur radio?

VANGE ARS
Steve, G0KVZ,
01268 552 606,
vars@live.co.uk

6 Junk sale

13 DVD

20 Talk

27 Natter night

WEST KENT ARS
Keith, G4JED,
westkentars@googlemail.com

10 Club construction challenge led by Richard, G8CDD

From 4 to 8 October, the **Martello Tower Group** is visiting the island of Herm, IOTA reference EU-114. The group will be operating two stations simultaneously on the bands between 80m and 10m using SSB and possibly RTTY using quarter wave vertical antennas. www.martellotowergroup.com/gp0pkt.

Always keen to promote amateur radio, Pete, M0PSX took the opportunity to join presenter Scott Ross on local radio station Phoenix FM in Brentwood, Essex to discuss the hobby. The interview was broadcast from studios based at The Brentwood Centre at 2.30pm on 12 July, as part of the Drivetime show. During the 8 minute interview he told the audience what amateur radio is and briefly covered the various special interests that make up the hobby, such as receiving pictures from amateur radio satellites, Field Day, DXpeditions and low-power (QRP) working. He explained how people could get involved in the hobby and obtain their own licence. Afterwards Pete produced a YouTube video of the interview.

For once a dry evening for a **Braintree and DARS** outside event. Melvin, G0EMK set off about 7.30pm to 'hide up' and at about 8.10pm his first transmission on 433.575 sent the four chasing teams to different points of the compass. The four teams were Richard, 2E0XRS and Jim, G0DCR; Ian, G8MKN and Ann King; Howard, G6LXK and Shane and, finally, Geoff, G0BYH and John, M5AJB. Geoff and John were the first to find Melvin parked up about 3 miles from the club QTH. His hiding place was at the small village of Greenstead Green. Using a handheld, small beam and an attenuator they soon found him. They were quickly followed by Howard and Shane (one of the club's younger members). The other two teams failed to find the fox. Everyone returned to the club QTH for tea and an inquest. A good time was had by all.

On 5 July the GX4WAB Torch Relay callsign came to Norwich and to celebrate **Norfolk ARC** put on a special event station at the QTH of Chris, G0DWV, in TG21. The station was set up in his contest caravan in the garden and covered all bands 80 to 2m, using big antennas on high towers. 762 contacts were logged on HF and a dozen or so on 2m FM. The event highlights included coast-to-coast North American pile-ups on 20m for three hours in the late evening, working all over the UK on 80 and 40m, helping Laura, 2E0LJG learn how to use RTTY (and then watch as she worked a huge pile up on 20m), plus a great social event. Thanks go to Nicky, 2E0NKI for sorting out the callsign and roster and operating the 2m FM station. The HF station was manned by Malcolm, G3PDH (CW 20m and 40m), Roger, G3LDI, (CW 20m and 40m), David, 2E0DWT, (SSB 20m and 40m), Tony, G0OOR (SSB 40m), Richard, G4TUK (SSB 20m), Laura, 2E0LJG (RTTY 20m), Andy, 2E0GOL (SSB 80m thru 10m) and to Ray, G3XLG, Steve, M0TZY, Lorna, M6LTJ, Kevin, M0UJD/G8RZZ and David, G7URP for helping. Thanks also go to Tina for allowing the QTH to be taken over for radio yet again!

REGION 13: EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

EAGLE RG
John, M6JMS,
01754 873 926,
simfree@btinternet.com

11 Gas pipelines talk by Anne Gilberthorpe

FRISKNEY AND EAST LINCOLNSHIRE COMMUNICATIONS CLUB
Contact the FELCC Information Line on 07554 362 020

9 FELCC radio rally and sale at Friskney Village Hall, Church Road, Friskney, PE22 8RR, 9am

HINCKLEY ARS
John, M0JAV,
07836 731 544,
m0jav@lowgables.co.uk

1 Weekend event: GBxSFF (NoV pending), Shackerstone Family Festival, nearest postcode is CV13 6NB

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO,
01427 788 356,
pamelagrose@tiscali.co.uk

1 Saturday Surgery at the Shack 0900 + SSB Field Day & 144MHz Trophy

2 SSB Field Day & 144MHz Trophy

5 G5FZ on the air and natter night

6 Club repeater net 145.725MHz, 2000

8, 15, 22 Saturday Surgery at the Shack, 0900

9 Second 70MHz Contest

12 80MHz Club Sprint + natter night

13, 20 Club net 145.375MHz, 2000

17 Committee Meeting 1930 the Shack

19 Formal Meeting BSA Club 2015

26 Club members meet with other local clubs at Newark and Nottingham Showground to prepare for the National Hamfest

27 Traders arrive for the National Hamfest at Newark Showground

28 National Hamfest, George Stephenson Pavilion, Newark Showground

30 Clean up after the National Hamfest, Newark Showground

LOUGHBOROUGH & DARC
Chris, G1ETZ,
01509 504 319

4 DF on 2m, normal start point

11 Open forum, topics chosen on the night

18 Talk on software defined radio by Steve, G8EBM

25 Practical evening

SOUTH KESTEVEN AMATEUR RADIO SOCIETY
Nigel, M0CVO,
01476 402 550

5, 19 Informal evening

WELLAND VALLEY ARS
Peter D Rivers, G4XEX,
01858 432 105,
g4xex@fsmail.net

3 2m club net on 145.275MHz FM

17 Round Robin Q & A session

The radio club at **Pitsford School** near Northampton meets after school on Wednesdays and some Thursdays. Congratulations to Jamie Bickers and Amrit Sidhu-Brar who have gained the Full licence. It is hoped that some more of the school's radio operators will gain their own callsigns next year.

FREE MEMBERS' ADS

Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 89).

FOR SALE

144MHz DX/EME array comprising 4 x 10-ele DL6WU's, Tonna four way splitter, LDF4/40 patch leads and stacking frame, all good condition, £320. Prefer collection. Nick, G0HIK, 07955 635 646, nickg0hik@googlemail.com (Ireleth-in-Furness, South Cumbria).

BATTERY & CHARGER. Elecsol 12V 100AK battery bought new September 2009 for £98. Elecsol 10A 4 stage charger £84.50 new April 2011. Used as standby and cure for noisy mains. £79 for both, buyer to collect. John Bennett, M0IIE, 01652 632 038 (Barton Upon Humber).

BEAUTIFUL LAKESHORE DX LOCATION of 7Q7BP and 7Q7YL. 0.72ha, house, detached shack, staff quarters, visitors chalets, all fully furnished, landscaped gardens, double garage, two cars, radio equipments, towers, antennas, lots more. For details contact Barrie, G4AHK, +44 (0)7990 523 051. Brian J Poole, G3MRC, 01562 68782 (Kidderminster).

COLLECTOR'S ITEM: Wood and Douglas synthesised 70cm FM xcvr. Full coverage 430-440MHz, 10W output, receiver preamp, S-meter. Built from kits in 1983, complete and cased, with all circuit documents, mic, speaker. Fully tested, £25 plus postage. More photos available. Gordon King, G3XTH, graking@talktalk.net (Hassocks, West Sussex).

FT-2000 (Dec 10), SP-2000, MD-200A8X. All hardly used and in original boxes, £1300. Reason for sale: I didn't move to the house it where I could use it fully. Buyer collects. Scott, G7RVB, 07775 504 654, s.piercy@btinternet.com (Great Yarmouth).

IC-718, AS NEW, £300. Watson W-25SM, £50. AV-201 SWR meter, £30. MFJ-931 Earth tuner, £50. Kent TP-1B Twin Paddle, £40. HK-708 Morse key, £20. Kenwood LF-30A LPF, £20. Comet CF-30 LPF, £15. All plus post and packaging at cost. Gordon, G3ZFZ, 01229 827701 (Barrow-in-Furness).

ICOM IC-718 TRANSCEIVER with UT-106 DSP fitted. Full working order, in excellent condition, with manual and original box, £375. Please inspect and collect. Ed Emery, G0WDT, 01782 717 837 (Newcastle Under Lyme).

INNOVANTENNAS 2m 9-ELE LFA YAGI. Assembled once, then packed away – its 4m boom is too long for my garden. Only £125 inc mainland UK delivery (Highlands, Islands or NI at extra cost). Please email lfa4sale@gmail.com for more information *[other contact details withheld at member's request. Ed]*

K1EL WKUSB keyer kit with enclosure, unopened. £50 plus p&p. No longer needed after buying touch keyer. Chris, M0PSK, chrism0psk@gmail.com (Liverpool).

MFJ VERSA TUNER II ATU, original box, instructions, power cable, hardly used, one owner from new. Bargain, less than half price, £100 plus P & P. E-mail for photographs. Bill, G7AKJ, 01395 568 503, billwrench213@btinternet.com (Devon).

MFJ-945E HF/6m cross needle antenna tuner, as new, £65. Rob Stratford, G6BDV, 01582 458 964 (nr Harpenden).

MILITARY HF RADIO used on 5MHz. BCC 39B adaptive tactical transceiver with BCC 540G automatic antenna matching and tuning unit, boxed. Also PSU Lambda DRP 480-1 24V DC 20A. Includes leads, connections, technical manuals, instructions. Buyer collects. £995 ono. Danny Sharpe, G3ZUN, 01825 767 496, JENDAN@elteide.fsnet.co.uk (Uckfield).

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).

QTH WITH INCOME, 3+ acres, hill crest, Gwent countryside; panoramic Severn estuary views. Superb for DX and horse lovers. Beautiful family home plus two income streams = excellent investment. Worth 750k, asking 675k ono. Maybe rent with option to buy? Frank, GW3GRY, 01633 400 836, frank.wiseman@uk2.net (Caldicot).

SILENT KEY SALE (GM8BBA). Elecraft K3, Icom IC-756 Pro III, Icom IC-726, Icom IC-703, Alinco DX-70TH, Icom IC-821, Trio TS-811E, Yaesu FT-225RD, Mydel MP-9600, MFJ-1026, MFJ-464, Watson W-40SMV. Details from John, GM8FHK, 01555 752 030, john8fhk@tiscali.co.uk (Carluke).

TS-130V 10W HF rig, £170. PS-20 PSU, £40. VFO-120, £40, FT-707 100W HF rig & FP-707 PSU, £200. TenTec 1330 30m QRP rig, £40. Altron CM35 telescopic mast, £100. Rupert, G4XRV, 01494 758 361, rupert@g4xrv.fsnet.co.uk (Chesham, Bucks).

TU5B heavy aluminium chassis and front panel 390x150x190mm. Two slow-motion drives. 6-way and two 4-way ganged switches, ceramic, heavy duty. No coils or capacitors, £6. 50 mixed control knobs 20-75mm diameter. All vintage/used but usable, £6. Buyer collects both please. Peter, G3HQT, 01489 570 735 (Warsash, nr Southampton).

YAESU FT-190E 2m Tx/Rx, boxed, as new, £80. AVAIR AV-400 SWR/PWR meter 140-525MHz, as new, £30. Buyer to collect. G3SYD, 01293 511 708 (Crawley, West Sussex).

YAESU FT-857D in mint condition, boxed and manual, £600 ono inc postage. Dave, G6ZSN, 01823 335 421, member@dpenny.fsnet.co.uk (Taunton).

WANTED

BATTERY CASE BT-9 for Kenwood TH79E H/H. All costs will be covered. T Underhill, G4MWP, 024 7646 2035 (Coventry).

DENCO VALVE TYPE COILS, colour white, for 1.6MHz. Ranges two, three, four and five, also Repanco RO3 coil for homebrew receiver project. Dennis, G4IAD, 01942 817 556, dennis.crompton@talktalk.net (QTHR, Bolton).

DRAKE T-4XC. Must be in very good working order. Will pay right price for right item. I don't need an AC-4 PSU. Vic Waddington, G4JSS, 01924 267 451, g4jss@tiscali.co.uk (Wakefield).

ICOM IC-725. Ideally cosmetically good, electrical faults can be cured! Accessories like PS55 power supply also considered. Anything may be of interest, two 'scrap' ones might make one good. Also wanted, Drake R4 'A' or 'B', preferably crystalled for 160m. Bruce, G3WCE, 01692 538 794, g3wce@grimblepoos.co.uk (North Walsham).

SOMMERKAMP/YAESU FT-7B. Must have AM and 29MHz coverage. Paul, GM4ULS. No phone, please e-mail gm4uls@googlemail.com (Perth).

TRIO/KENWOOD RECEIVER wanted in good condition. George Watson, GW4EVJ, 01792 843 948 (Swansea).

USER MANUAL for a Yupiteru MVT-7000 handheld scanner, no photocopies please, reasonable price paid. Contact Chris, 2E0DEP, chrisgarner@talktalk.net (Cambridgeshire).

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 SEPTEMBER – TELFORD HAMFEST – Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF, 433.200MHz. TS, B&B, SIG, free CP, LEC, FAM. Details from Martyn, G3UKV, 01952 255 416. [www.telfordhamfest.co.uk].

8 & 9 SEPTEMBER – NATIONAL TRUST, POLESDEN LACEY, Nr. LEATHERHEAD, SURREY – Dorking & District Radio Society will operate with callsign GB0NT on the Trust's Open day, Saturday 8 Sept and on Sunday 9th. Further details from Garth: G3NPC 01737 359 472 or www.ddrs.org.uk

9 SEPTEMBER – NORTH NORFOLK AMATEUR RADIO CLUB CAR BOOT SALE – Muckleburgh Military Collection, Weybourne NR25 7EG. Radio & non radio pitches. OT 1000, pitches from 0700. Radio Museum open free. For further information see www.gb2mc.com.

9 SEPTEMBER – FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY – The Friskney Village Hall, Church Road, Friskney, Lincs, 6.5 miles south of Skegness. Details Bren, 2E0BDS, 01754 820 060. [www.felcc.com].

15 & 16 SEPTEMBER – AMSAT-UK SPACE COLLOQUIUM – Holiday Inn, Guildford GU2 7XZ. LEC, AMSAT shop, GB4FUN. [www.uk.amsat.org].

16 SEPTEMBER – TORBAY ANNUAL COMMUNICATIONS FAIR – Newton Abbot Racecourse, Newton Abbot, Devon TQ12 3AF. TS, B&B, C, DF, RSGB Books, OT 9.30/10am, £2. Details Mike Dixon, 01803 557 941, rally@tars.org.uk.

22 SEPTEMBER – FOG ON THE TYNE RALLY – Whitehall Road Methodist Church Hall, Bensham, Gateshead NE8 4LH, organised by Angel of the North ARC & South Tyneside ARS. £1.50, OT 10.30, TS, C. Car parking available in the school next door. Nancy Bone, G7UUR, 01914 770 036 (eves), nancybone2001@yahoo.co.uk. [www.anarc.net].

23 SEPTEMBER – 22nd GREAT NORTHERN HAMFEST – Barnsley Premier Leisure Complex, Queens Ground, Queens Road, Barnsley, South Yorkshire S71 1AN. OT 10.30am – 3pm, £3, DF, TS, SIG, RSGB book stall, LB, C, FAM. Ernie, G4LUE, 01226 716 339. [www.greatnorthernhamfest.co.uk].

28 & 29 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].

6 & 7 OCTOBER – BATC CONVENTION – Everest Community Academy, Basingstoke. LEC, TS, SIG, Bring & Buy, test & fix area. Includes BATC BiAGM on the 7th. [www.batc.org.uk/club_stuff/convention/index.html].

7 OCTOBER – AUTUMN MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, civil, military and vintage radio equipment plus vehicle spares and more. Contact Rod Siebert, 01270 623 353, coldwatr@hackgreen.co.uk. [www.hackgreen.co.uk].

7 OCTOBER – BLACKWOOD AND DISTRICT ARS RALLY – Coleg Gwent, Risca Road, Cross Keys NP11 7ZA. TI V44 (S22), CP, OT 10am, £2. TS, B&B, SIG, C, WIN. Dave, GW4HBK, 01495 228 516, gw4hbk@talktalk.net. [www.gw6gw.co.uk].

12-14 OCTOBER – RSGB CONVENTION – Horwood House, Little Horwood, near Milton Keynes. Full convention programme with lectures for all interests and all levels of technicality. Principal sponsor Martin Lynch & Sons. [www.rsgb.org/rsgbconvention].

14 OCTOBER – HORNSEA AMATEUR RADIO CLUB RALLY – Floral Hall, 7 The Esplanade, Hornsea, East Yorks HU18 1NQ. OT 10.30, CP, TS, B&B, SIG, RSGB, RAFARS, LB, C, DF, WIN. Details from Rick, M0CZR, R106221@aol.com. [www.hornseaarc.co.uk].

This list shows all rallies and events we are aware of as at 1 August 2012. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e-mail (to GB2RS@RSGB.org.uk) then we suggest you set your e-mail program to request a 'read' receipt so you can be sure we've seen the details.

TI Talk-In; CP Car Park; £ Admission; OT Opening time - time for disabled visitors appears first, (eg 10.30/11am); TS Trade Stands; FM Flea Market; CBS Car Boot Sale; B&B Bring and Buy; A Auction; SIG Special Interest Groups; MT Morse tests; MA Foundation Morse Assessments; LB Licensed Bar; C Catering; DF Disabled Facilities; WIN prize draw, raffle; LEC Lectures/Seminars; FAM Family attractions; CS Camp Site.

SILENT KEYS

We regret to record the passing of the following members:

Mr R Issatt, 2E1BGV	2/7/2012
Mr P Dean, G3FNT	5/5/2012
Mr D M Sangster, GM3FIZ	16/6/2012
Mr J F Lucas, G3ISU	23/3/2012
Mr J H Wildsmith, G6CUY	6/2012
Mr H Stockley, G3LLS	23/7/2012
Mr W Empsten, ON4ZN	12/2011
Mr P Cheung, VK3AVT	
Mr J C Davidson, WB8BUZ	

20 OCTOBER – G QRP CLUB MINI CONVENTION – Rishorth School, Rishworth Sowerby Bridge, West Yorkshire HX6 4QA. OT 10am. Trade enquiries only, g0bps@gqrp.co.uk. [www.gqrp.com/rishworth.htm].

20 OCTOBER – CARRICKFERGUS AMATEUR RADIO GROUP RADIO RALLY – Downshire Community School, Carrickfergus, BT38 7DA. OT 12:30pm, £3, TS, B&B, CP, C, DF, SIG, RSGB, MT. Details from Tim, MI0TBL, carg@hotmail.co.uk. [www.radioclubs.net/carg].

21 OCTOBER – GALASHIELS AND DISTRICT ARS RADIO RALLY – The Volunteer Hall, St Johns Street, Galashiels, Scottish Borders TD1 3JX. OT 11.30/11.15, £2.50. B&B, TS, C, WIN. Details from Jim, GM7LUN on 01896 850 245, mail@gm7lun.co.uk.

28 OCTOBER – NEW ONE DAY EVENT – NORTH WALES RALLY – John Bright School, Llandudno LL30 1LF. 10am – 4pm, £4.50, TS, B&B, CP, DF, DIS, C, SIG. Details from Gordon, MW0GBR 0773 3531 766 or rally@nwrs.org.uk. [www.nwrs.org.uk].

4 NOVEMBER – HOLSWORTHY AMATEUR RADIO RALLY – Holsworthy Community College, Victoria Hill, Holsworthy EX22 6JD. Contact gsowter@talktalk.net.

10 NOVEMBER – ROCHDALE & DISTRICT ARS TRADITIONAL RADIO RALLY – St Vincent's Church Hall, Cutgate, Rochdale OL12 7QL. OT 10.30, £2.50 (Concessions U12 & Seniors), B&B, C. Pitches £7.50. Dave, G0PUD, 01706 346 517, dave.shaw1@sky.com. [www.radars.me.uk].

11 NOVEMBER – WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park Racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. TI, free CP, OT 9.50/10.00. TS, FM, B&B, SIG, C, DF, WIN, LEC. Details Paul, M0CJX, 08451 650 351, info@radiofairs.co.uk. [www.radiofairs.co.uk].

17 NOVEMBER – HALTON & DISTRICT RADIO AMATEURS RALLY – The Heath

SPECIAL EVENT STATIONS FOR SEPTEMBER 2012

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
01/09/2012	GB5OLR	50 years of Loughton & Epping Forest ARS	Essex	LHV27	G0TOC
	GB1SKC	Saint Keverne Church	Helston	L	G3UYN
02/09/2012	GB4HLB	Holyhead Lifeboat	Holyhead	LH2	MW0AQZ
08/09/2012	GB5SMC	Saint Marys Chruch	Northallerton	LH	G3MAE
	GB2AC	Arlington Court	Burnstable	LHV27	M0BRB
	GB2CCC	Christ Church Cathedral	Oxford	L27	G3NGX
13/09/2012	GB5IFC	International Firac Congress	Sheffield	LH27	G4GNQ
15/09/2012	GB1TTT	Transmission Twenty Twelve	Netherton	TLHV27	G1TYV
	GB2HEN	HENHAM	Suffolk	TLHV27	M1TWO
17/09/2012	GB1LM	Liverpool Marathon	Wirral	LHV27	M0BFV
20/09/2012	GB2MBS	Market Bosworth Station	Bosworth	LH	G0IJM
22/09/2012	GB2PPS	Papplewick Pumping Station	Nottinghamshire	LH	G0UYQ
	GB0CVR	Colne Valley Railway	Essex	LHV27	G0IAG
	GB0LMR	Leyland Miniature Railway	Lancashire	TLH27	G4PF

Business & Technical park, Runcorn, WA7 4QX. OT 10.15/10/30am, free admission, TS, B&B, C, DF, SIG, cash machine. Contact George Low, G0RLF, 01928 897 591 (daytime), g0rlf@talktalk.net.

25 NOVEMBER – 34th CATS RADIO & ELECTRONICS BAZAAR – 1st Coulsdon Scout HQ, r/o Council Car Park, Lion Green Road, Coulsdon, Surrey. 10.00-13.00, £1, B&B, C, DIS, CP free. Details Glenn, G4FVL, chairman@catsradio.org.

25 NOVEMBER – NEW VENUE – PLYMOUTH RADIO CLUB RALLY – Harewood House, The Ridgeway, Plympton, Plymouth PL7 2AS. CP, TI, OT 10.00, £2, TS, B&B, C. Contact g7nhb@hotmail.co.uk.

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.

2013

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, e-mail 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].

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 (Rally Coordinator) at southglosradiorallycoordinator@gmail.com or telephone: 07806 310 095 [southglosradiorally.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].

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. Contact Shaun, G8VPG, 01225 873 098, rallymanager@westrally.org.uk. [www.westrally.org.uk].

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the 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 may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

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! GOTA VIBROPLEX BUG KEY ? You need a CableTidy! Job Done.... Our Product help is always available. See www.g3liv.co.uk johnny@melvin.com 0191-2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

PROGRAMMING and DATA MODE CABLES for Icom, Yaesu, Kenwood, Ten-Tec, Motorola, Vertex, and many other brands at WWW.RADIOARENA.CO.UK

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.tin-tagel-crafts.com

MODERN MILITARY SURPLUS. Unused antenna kit designed to survive the North Atlantic. Fernpatch Engineering Ltd. www.yachtradio.co.uk

70CM-DUPLEXER, six large cavity-resonators, commercial product by KATHREIN/Germany, Rejection 2x 110 dB at 1.6 MHz Rx/Tx-shift! Insertion-loss 1,5 dB, Power 200 Watts, £440 ono (shipment incl.), pse request entire information + data at j.r.gabriel@t-online.de

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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

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VHF ANTENNAS FROM I0JXX in stock in the UK: Yagis for 6m, 4m, 2m and 70cms.Plus UK made clamps, brackets, insulators, plastic caps and inserts, power splitters: Please visit www.aerial-parts.co.uk.

WANTED

UNWANTED VALVE AMPLIFIERS, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Cash paid. Contact Peter G3ZRS on 01482 862323 or e-mail: g3zrs@hotmail.co.uk

MISCELLANEOUS

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147KHz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.letsgonorth.co.uk/dunnet_head Email: briansparks@dunnethead.co.uk

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

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

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CONTEST LOGGERS - SD by EI5DI. Free and Unrestricted in all RSGB HF Contests. www.ei5di.com

BUSINESS CARDS

CLASSIFIED ADS

WHAT'S RIGHT WITH AMATEUR RADIO?

Mike Stewart, G4RNW

Much of the correspondence in this and other radio magazines is often full of grumbles regarding the state and possible 'fate' of our hobby. This is quite understandable. We are hemmed in with regulations, our spectrum is being encroached, the noise level from various sources, some of it quite illegal, makes the rig unusable at times, plus mixed feelings regarding the relative authority (Ofcom) and the support we often feel that is lacking in protecting our hard won and totally legal rights.

But, do we ever sit back and take stock of that which we should be grateful for? First, we are surrounded by, in the main, a really decent collection of enthusiasts. In the 30 years since I first acquired my licence I can barely recall ever coming across an amateur who was less than friendly and supportive. (Well, maybe one or two desperate Eastern European contesters!)

One only has to look at the adverts in *RadCom* and other magazines and scan the vast amount of gear on offer, to see that the game is definitely alive and kicking. The range and quality has never been better, plus in real terms the equipment is probably cheaper than ever. So the manufacturers at least have faith in the future.

I read recently that after WWII there were about 6,000 licensed radio amateurs in the UK – and the figure now? I think at the last count it was about 60,000! Not bad for a hobby often overshadowed with doom and gloom. Yes the hobby has changed and is changing all the time, but I can't see anything wrong with that.

Plus we have the RSGB to represent us. Now I know there has been much recent criticism of the Society in some quarters regarding certain policies and certainly things in recent years may have, in some people's opinion, not been handled satisfactorily. But at the risk of being accused of toadying (another term came to mind but I thought it unsuitable for a serious and conservative organ such as *RadCom*) we have a lot to thank the Society for. It seems to me that it is now looking to the future in a positive and, may I say, 'dynamic' light. Things can only get better.

So cheer up fellow amateurs. All is not lost by a long way.

MOVING GET TOGETHER

Michael Jones, M6TMJ

I would just like to take the time to thank you for *RadCom*. It's a brilliant magazine and while reading it at school makes me look somewhat a little bit more intellectual being only 14! Even though half of the content in *RadCom* I don't have a clue what some of it means, it's still a good read.

Anyway on serious note, I'm trying to set up a time where some of the younger amateurs can have a monthly meeting on the air. It would be something where the younger amateurs could just have a chat on the air, much like lots of the stuff you hear on 40m (but with young people). (Old fogies would be more than welcome to contribute, nothing beats experience!)

I'm also in the process of making a presentation to try and get some more people in to amateur radio as I'm one of a very few young amateurs that live in the area. If anyone would like to contribute to the presentation it would be a great help – pictures would be great.

If anyone is interested in this project, send me an e-mail at m6tmj@yahoo.com or send me a message on QRZ.com and when it's finished I'll send it out to anyone that wants it.

I hope that other young members will support Michael's initiative. I will certainly contribute to the net from time to time (and try not to be too much of an old fogie!). We are very conscious that RadCom may not always meet the needs of newcomers (young or not-so-young) and we are looking at ways of making more novice-friendly material available.

Graham Coomber, G0NBI
RSGB General Manager

FUTURE DIRECTION

Giancarlo Moda, I7SWX

Following Mike Stuart's 'Future Direction' and the suggestion from Harold Johnson, W4ZCB, I would like to add some few comments. Financial aspects force us to find cheaper solutions on anything. Well, ARRL has started their *QST* online publication, in Italy many ARI members are pushing for an electronic version of our *Radio Rivista* to make membership cheaper. The RSGB and several other Societies are certainly looking for a similar solution. Does having an online magazine make much difference to the membership charges? How many members will be able to access an internet service? Maybe 80% at least, it sounds OK.

But... how many people like to read a technical magazine on a PC screen or a tablet? At a certain age the eyeballs start giving trouble and a PC screen is not the best solution. Also, a research institution in UK has published a warning regarding posture problems due to PC or tablet use by people.

As you may understand, I am for keeping a paper magazine for three simple reasons: I do sometimes print pages from electronic magazines or circuit diagrams but the quality of the paper is not too good and also the consumption of inks is quite high; I do like to read my magazine in a 'thinking room' (for button pushers, a WC) where my brain is more 'isolated'; I like to read while on my bed too and often I go off to sleep and drop the publication on the floor... can you imagine me going around with my portable PC or tablet and drop it?

Les Brook

I have to disagree with W4ZCB on the future of the magazine. I'm sure it would be cheaper to send *RadCom* by electronic mail but, for me, not more convenient.

I like to dip in and out of the articles, pick the magazine up and put it down, look at the prices in the adverts and generally scan and browse. I don't believe this can be done in the same way in an e-mail or other electronic format. Plus you would have to log on download and maybe even print it. What a whole load of nonsense.

I would be and am happy to pay for a paper copy and hold it in my hand. Don't forget when electronic mail first came on the scene the doom sayers predicted the end of the printed word... not for me.

ELDERLY ICOM TRANSCEIVERS

Ken Street, GM3ENJ

The following may be of interest to those of us who persist with elderly Icom transceivers. Being in that category, this tale is intended as a tribute to the Equipment Maintenance Branch of Icom UK.

An Icom IC-251E 2m transceiver has been and is the mainstay of amateur radio on 2m for me. The transceiver itself is 31 years old and came to me third hand 12 years ago. Some time ago, I decided that an overhaul was necessary. Now, who would take on such an antique? Icom?

I phoned Icom UK, more in hope than in earnest, and somewhat apologetically enquired about overhaul possibilities. To my great surprise I was told "Yes, we can repair it, provided spares are available". The transceiver (well packaged) was sent to Icom UK and a day or so later I was e-mailed with a repair cost estimate. My 'go ahead' was almost instantaneous!

About a fortnight later I was e-mailed with the news that the overhaul was complete and the actual repair cost was noted. It was as estimated. On settling up (by phone and card) I was told when the repaired transceiver would be delivered by Icom's own carrier.

It was!

The attendant paper work showed about a dozen faults corrected or repaired and the remarks *"Superb Rx sensitivity due to its MuTek front end and mixer... Excellent Tx... PAT tested ok"* were appended. Therein lies the reason for keeping this antique running.

Time passed and about 6 months later I had just started a QSO when there was a loud crack and the transceiver died. I will

not bore you with the immediate aftermath of that catastrophe, sufficient to say that I phoned Icom to ask their help – again! This was willingly given. Luckily, I had kept the box in which the transceiver had been returned, so I repacked it and arranged yet another trip to Icom for the carrier. Time passed. I should say at this point that the job took somewhat longer than the previous one as the spare parts position was very difficult to say the least. The following extract from the second delivery paperwork tells the rest of the story.

"Radio brought back from the brink by the kind donation of another SMPSU. PSU made to work and fitted to 251. PAT test reconfirmed and still valid. Radio still to spec."

Finally, the costs incurred in both cases were, in my view, very fair considering the amount of skilled effort, dedication and perseverance required plus transport to my door. Can I finish by saying a big thank you to Chris Ridley, G8GKC, Geoff Boakes, G8PPQ and the anonymous donor for making it possible for an elderly amateur to continue his hobby.

OLYMPIC NOVS

Tam Brown, MOOTGB

Just thought you would be interested in this wee bit of information. On a recent contact with Tom, GM4LRU over in the Port Seaton area, I had used my Olympic NoV, turning my usual callsign MMOTGB into MOOTGB. I noticed that the last three letters of my callsign, TGB, is also well suited to the Olympic theme "T - Team, G - Great, B - Britain"!

200TH YL OPERATES GB2HC

Richard, G3XWH

To follow up the letter published in the June edition regarding the last operation of GB2HC from Harrogate Ladies' College. The photo shows Hanna, M6HDK operating GB2HC on 23 June. Hanna was licensed in May and became the 200th YL to pass an amateur radio examination at Harrogate Ladies' College since the first candidate in 1981.

A BIG THANK YOU

Rod Bullen, MOKRP

With special thanks to Steve Hartley, G0FUW and Dan Trudgian M0TGN for their help via the Bath Buildathon Advanced Distance Learning. Without them and the course, my new callsign would not have been possible. Thanks also to Yeovil ARC for their help in organising the exam venue. I need to thank both Sam, G0SBI and Dave, M0OBW for getting me through the Foundation and Intermediate licence at the Beacons.

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.

INTERFERENCE

Nick

It looks like more interference on the way with the launch of YouView IPTV. Internet TV is all well and good, but with the proliferation of Wi-Fi boxes and now powerline and Ethernet TV broadcasting, amateur radio may be in for a tough time ahead.

www.reghardware.com/2012/07/02/youview_recommends_powerline_networking_for_its_iptv_box/.

WHAT CONSTITUTES A QSO

Ian Bevan, G0YAP

I have been reading with interest the letters in recent *RadComs* about what constitutes a QSO. The 'rubber stamp' QSO seems to be the norm nowadays. 'You are 59, please repeat your callsign' (?) 'QSL via buro... 73s'. If you are lucky they will tell you what radio they are using, yawn yawn... or the weather (who cares?). I recall something my tutor (Pat Gowen, G3IOR) said when I was studying for my RAE. He said 'you can hold an amateur radio callsign, but holding a conversation on air is a skill you must learn as time goes on' (or words to that effect).

The skill is to make your QSO interesting, make your CQ call upbeat and clear – sell yourself. Who wants to reply to someone calling CQ who sounds like a manic depressive? I have my details on QRZ.com and in my details I have mentioned what radio I use and antenna but also my other interests. This often leads to the chat going away from radio and into other areas. I recently spoke to a chap down in Kent. Looking him up on QRZ.com I saw he was into Land Rovers, one and a half hours later we said 73s and my knowledge of these vehicles was greatly increased! Another trick I use on PSK31 is to throw in a 'googly'. The QSO goes through the normal macros, my locator is, my rig is, the antenna is (zzzzzzz), instead of just sending your standard macro back, ask a question that he/she cannot answer will a pre typed block, 'What's the best contact you've had on data?' is a good one. If you work on your skill, you can get these stations to actually communicate with you and 9 times out of 10, they will sign off telling you they have had the best QSO in a long time. Operators become lazy. A good conversation, be it over the air or down the pub, needs effort from both parties.

SPECIAL RSGB QSL CARDS AND QSO PARTY

David Ferrington, M0XDF

What a fantastic offer and a great idea!!

Although licensed for 9 years, I've never got around to QSLing, much to my shame (if you're waiting for a card from me, I will get them done sometime). I have just ordered 200 of the combined cards in anticipation of working at least that many stations, especially with the QSO party.

I have always intended to QSL, but via an electronic print method (ie GlobalQSL), but never got around to it. This has prompted me to be determined to do this 'the old fashioned way' and write the cards.

May I congratulate the RSGB on picking up on the opportunity, as many other national societies do, for some special events. Pity we didn't do it for the Royal Wedding, but hindsight is 20/20 vision.

I hope this will be just the start of this kind of opportunity in the future and may be just what the doctor ordered to encourage radio amateurs to re/join the RSGB – this kind of exclusive opportunity may tip the balance. I don't see anything on p8 of May's *RadCom* saying the QSO party is RSGB members only, but I hope that is the case.

Once again, thank you, RSGB, for the opportunity.

We're glad that you enjoyed the Queen's Diamond Jubilee QSO Party, as it was intended to be a fun event in which everyone can join in, members or non-members – the more the merrier! I aired my own call and had some great contacts, even a call from a friend for his first QSO. What a great way to start on the air!

John, G3WKL

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Built £2199 D Kit £1999 D

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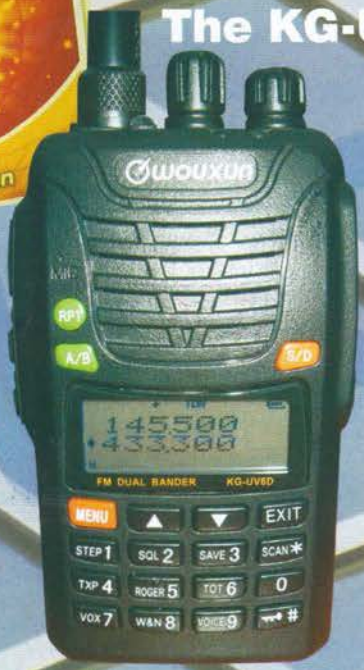

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