RadCom

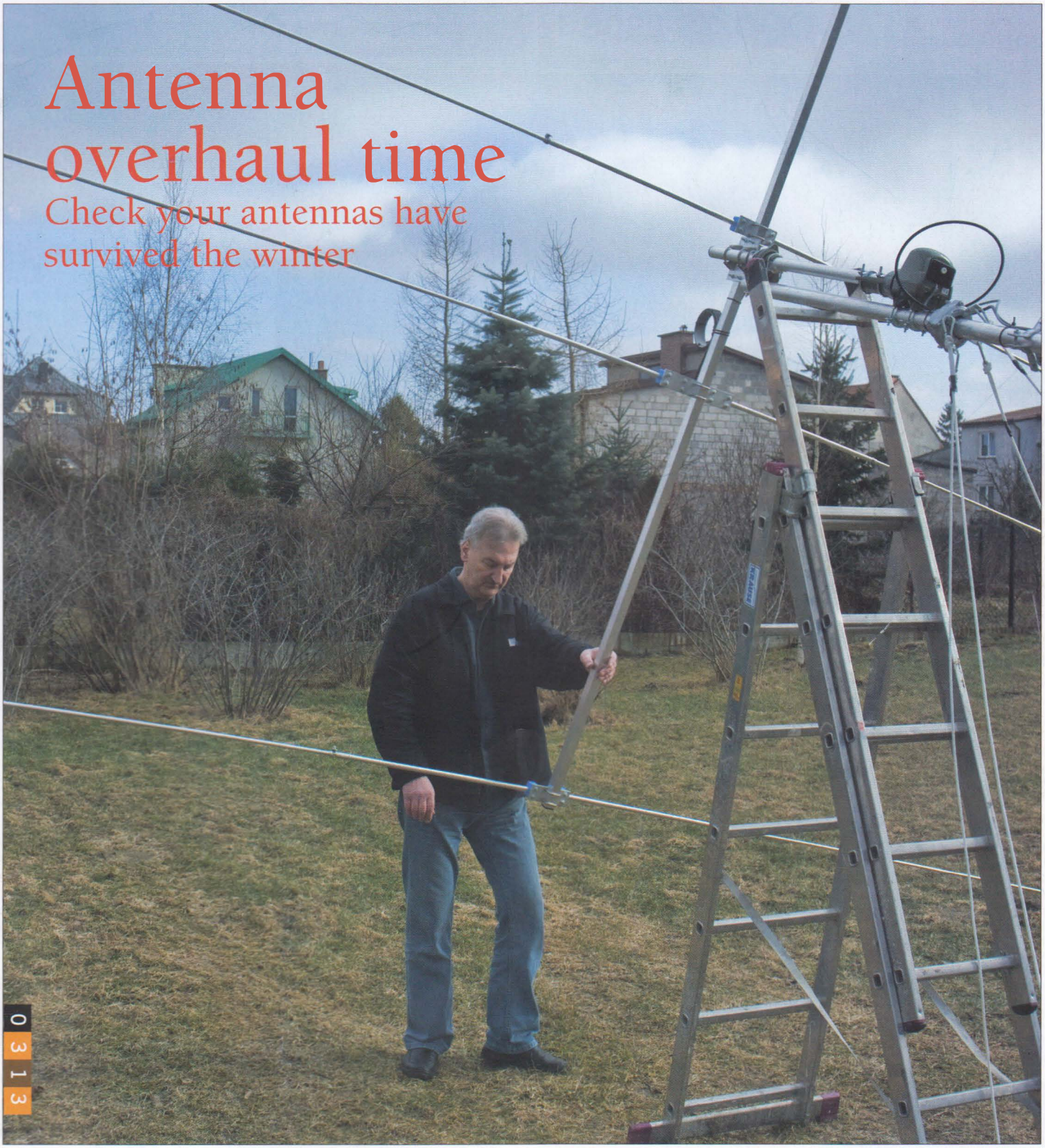
RADIO SOCIETY OF GREAT BRITAIN ◆ 100 YEARS WORKING FOR AMATEUR RADIO

Radio Society of Great Britain
RSGB
100 YEARS 1913 - 2013

MARCH 2013 ◆ VOLUME 89
NUMBER 03 ◆ £4.95

Antenna overhaul time

Check your antennas have survived the winter



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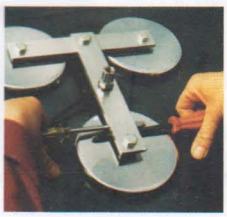

Antennas

Magmounts, vacuum mounts, roof rack mounts and more explained by Peter Dodd, G3LDO

GHz Bands

The 2013 Heelweg meeting and news of G100RSGB on EME reported by Dr John Worsnop, G4BAO

Review

The versatile Peak Atlas DCA PRO component analyser examined by Andy Talbot, G4NJT

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New KENWOOD TS-990S 160m - 6m ~ Due Early February!

From This...

...To This!

The Kenwood® TS-990S featuring a dual TFT display and dual receiver will cover the HF amateur bands plus 6 meters. This radio will be the top-of-the-range flagship model in the Kenwood Amateur radio line-up. Coverage is 1.8 - 54MHz and RF power is adjustable from 2 to 200 watts. This radio features a built-in automatic antenna tuner and built-in AC power supply. It has a serial port, USB ports and Ethernet port. By the time you read this we may have stock. We are offering some great part exchanges on this exciting transceiver.

2 Year Warranty!

Order Now!
Limited Stock

Comes With Free Heil HM-12 Microphone
For a limited time only

The 'Top-Of-The-Range' Kenwood Rig We've All Been Waiting For! £6599.95 D

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.

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

TS-590S 160m - 6m Transceiver

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

ICOM IC-7410 HF-6m Transceiver

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

IC-7600 HF Transceiver

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

IC-9100 HF Transceiver

The Icom IC-9100 is ideal for the operator who is looking for a complete high performance radio that covers HF - UHF in one box. It offers 100 Watts output on all bands up to 2m, whilst on 70cms you get a healthy 75 Watts. An internal auto ATU is included which covers HF plus 50MHz.
IN STOCK £2899.95 D

Tigertronics SignaLink USB Soundcard Interfaces

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

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

PLUG & PLAY JUMPER MODULES FOR SL-USB

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

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

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New Yaesu FT-DX3000 HF & 6m Transceiver

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

FT-DX3000 Phone For DEAL PRICE!

In Stock Now!

In answer to those who wanted a larger and more comprehensive screen on their Yaesu rigs - here it is in full colour! We think it is the best yet. We have had the demo unit here for around 2 months. By the time you read this we should be able to deliver!

New Icom IC-7100 - Just about to ARRIVE!

IC-7100 Phone For DEAL PRICE!

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

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

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 **£597.95 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**

FlexRadio Systems® Software Defined Radios — New FLEX-6000 Signature Series

SmartSDR™ With the Flex-6000 Signature Series radios, FlexRadio brings a wealth of new capabilities to the amateur including direct digital sampling reception, transmission and networking. At the core of all these new capabilities is SmartSDR. SmartSDR organizes all of the signal processing power in the Flex-6000 series into an advanced reusable framework.

Plug & Play The series was designed with Plug & Play installation as a requirement. There are no drivers or interface cards to install. Just plug the radio into an antenna, power supply and network, load the SmartSDR software on your existing PC and operate.

FLEX-6500

160m-4m 100W

FLEX-6500	£3449.95 D
FLEX-6700	£5799.95 D
FLEX-6700R	£4799.95 D

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 **£249.95 C**

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

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

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

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

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

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

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

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

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

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

HF - UHF in One Box!

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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Online Catalogue
www.wsplc.com

MicroHAM Products

MicroKeyerII Complete Single Operator USB Interface.

£329.95 D

microKEYER II™ is the most powerful All-In-One single radio multi-mode USB interface and sound card for CW, SSB, AM, FM, and digital modes (RTTY, PSK31, SSTV, APRS, PACKET, and many others) available anywhere. Using a single USB port, microKEYER II can interface with any Windows-based logging or control program to run any FSK, CW , AFSK, SSB, AM, or FM mode. microKEYER II also includes a rig control interface (CAT/CI-V) with interfaces for all supported radios, a powerful CW memory keyer, and a buffer for keying a Power Amplifier and LNA switcher. Package contains: microKEYER II™, CDROM with drivers, control software and manual, USB A-B cable 2m (6.5ft) long.

Ready made interface leads for individual radios stocked - call us.

DIGIKEYERII

All-In-One USB Interface for amateur radio digital mode operation c/w CD-ROM & USB Cable. £249.95 D

MICRO-2R

2 radio controller designed for any amateur with two transceivers & any control interface. £299.95 D

MK2R+

MicroKeyer 2R plus 2 radio controller all-in-one! Ideal for the serious contest operator or DXer. £719.95 D

WATSON Made for Watson by M0CVO Antennas

1:1-BALUN-1.5 1.5kW 1.8-30MHz A 1:1 balun able to handle up to 1.5KW RF power. Used to feed a balanced antenna, or doublet with unbalanced feeder, reduces static on feeding. £54.95 C

4:1-BALUN-1.5 1.5kW 1.8-30MHz A 4:1 4:1 Extra High Power 1.5KW current balun for Windom, off centre fed or folded dipoles. Reduces 200 - 300 Ohms at feed point of antenna to 50 Ohms enabling the antenna to be fed with 50 Ohm coaxial cable. £54.95 C

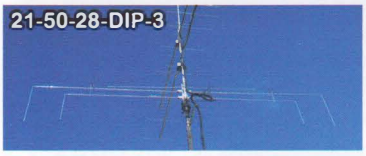
W-LINE
1:1 Line Isolator 400W 1.8-30MHz Removes RF from Coax. £33.95 C

1:1, 4:1-BALUN & 9:1-UNUN 400W 1.8-30MHz Can be used as centre feed point. Each model £33.95 C

MD-12HP 12m Mono for portable fixed station 400W CW 1:1 Balun 5.77m £45.95 C
MD-17HP 17m Mono for portable fixed station 400W CW 1:1 Balun 7.95m £45.95 C
LW-20 Multiband HF long wire 9:1 UNUN 80-6m inc WARC 20m long 400W £45.95 C
LW-10 Multiband HF long wire 9:1 UNUN 40-6m inc WARC 10m long 400W £45.95 C
HW-80HP Multiband HF off-centre dipole 4:1 balun 80-10m 40m long 400W £71.95 C

InnoAntennas Performance through Innovation

NEW OP-DES HF Nested Dipole Arrays



- Reduced Turning Radius - Shortened element without loading • No Matching devices or associated loss • No Traps or Coils or associated loss
- 1, 2 & 3 band versions available • Single feed point
- 5kw power rating • 100mph+ safe wind speed
- All A4 stainless steel hardware

TriBand Rotatable Nested Dipoles

21-50-28-DIP-3	3 el. 21, 28 & 50MHz rotatable	£199.95 D
14-21-28-DIP-3	3 el. 14, 21 & 28MHz rotatable	£299.95 D
14-18-24-DIP-3	3 el. 14, 18 & 24MHz rotatable	£299.95 D

High Performance 70cms Yagis.

432-LFA-14-SQ	14 element 2.87m 3kW 15.60dBi	£119.95 D
432-LFA-15-SQ	15 element 3.17m 3kW 15.72dBi	£129.95 D
432-LFA-16-SQ	16 element 3.47m 3kW 15.87dBi	£139.95 D
432-LFA-17-LN	17 element 3.90m 3kW 17.80dBi	£159.95 D
432-LFA-18-LN	18 element 4.28m 3kW 18.03dBi	£174.95 D
432-LFA-19-LN	19 element 4.56m 3kW 18.29dBi	£185.95 D
432-LFA-20-LN	20 element 4.88m 3kW 18.60dBi	£195.95 D
432-LFA-21-LN	21 element 5.21m 3kW 18.81dBi	£205.95 D

Dual Band 50 & 70MHz Yagis

70-50-YAG-8	(4+4) 2.10m 8.88dBi / 8.40dBi	£199.95 D
70-50-YAG-9	(4+5) 3.50m 9.25dBi / 10.53dBi	£249.95 D
70-50-YAG-11	(6+5) 4.9m 11.09dBi / 10.46dBi	£299.95 D

W&S Are Sole UK Resellers

The NEW OWL Super Light Yagis

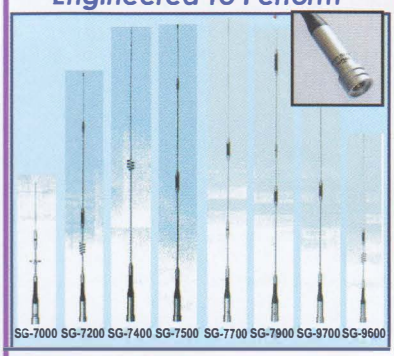
This new range provides powerful, wideband design within a simple, light weight mechanical structure meaning this Yagi is ideal for Portable, SOTA & light home installations.

144-OWL-3	3 element i 52cm 6.94dBi gain	£39.95 D
144-OWL-4	4 element 56cm 8.58dBi gain	£49.95 D
144-OWL-4-RM	4 element 90cm 8.58dBi gain	£53.95 D
144-OWL-5	5 element 1.3m 10.55dBi gain	£59.95 D
144-OWL-5-RM	5 element 6m 10.55dBi gain	£63.95 D
144-OWL-6	6 element 1.8m l11.65dBi gain	£75.95 D
144-OWL-6-RM	6 element 2.1m 11.65dBi gain	£79.95 D
144-OWL-7	7 element 3m 12.88dBi gain	£99.95 D
144-OWL-8	8 element 3.75m 13.4dBi gain	£129.95 D
144-OWL-9	9 element 4.4m 14.23dBi gain	£149.95 D

Full band coverage without retuning 144-146MHz closed loop folded dipole for less man-made noise, easy & fast to build and tune. Vertical or Horizontal mounting options. High performance design, No Matching device or associated loss. "RM" = Rear mount

DIAMOND ANTENNA

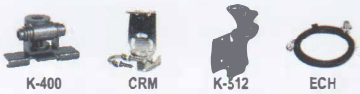
Engineered To Perform



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

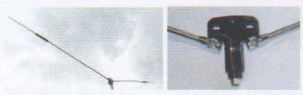
Diamond Mounts

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



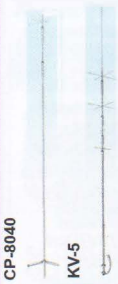
K-400 Heavy Duty Hatch mount £39.95 A
CRM Roof rail / Mirror Mount £14.95 A
K-512 Roof bar mount £44.95 C
ECH 5m cable kit PL-259 £12.95 A

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 SALE!!!

GZV-2500 25 Amp Switch Mode power Supply **Was £129.95 Now £99**
HC-200S SMA UHF 350-520MHz rubber duck 10W 0.19m **Was £16.95 Now £12**
2D4MR Mobile mount cable kit - very low loss **Was £29.95 Now £24**
3D4MR Cable kit for mobile antenna SO-239 socket base, coax & PL-259 4m long **Was £32.95 Now £27**
DL-50A Dummy Load DC-1000MHz SO-239 types **Was £41.95 Now £34**
RH-795 BNC 70-1000MHz telescopic whip max 115cmAM/FM 10W **Was £24.95 Now £19**
RHV-5 6/10/15/20/40m mobile whip 100W 1.8m PL-259 **Was £144.95 Now £119**
SGM-805N 2m/70/23cm 0/3.8dBi/7.2dBi 60W 0.57m N type **Was £82.95 Now £69**
UM-700K/M/V Hand held speaker microphone **Was £22.95 Now £18**
W-8010 HF dipole 80m/40m/20m/15m10m 1.2kW (PEP) 19.2m 2.5kg **Was £139.95 Now £115**
X-6000 2m/70cm/23cm fibre glass 3.05m long N type **Was £189.95 Now £159**

See www.wsplc.com for full descriptions
Offers Valid Until 31/3/2013

Diamond VSWR Meters

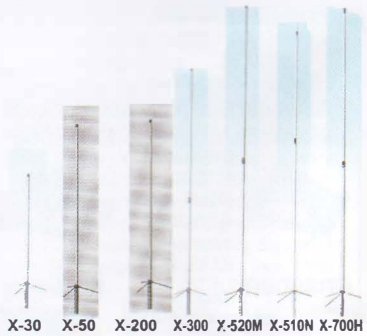
SX-100 HF 3kW 1.6 - 60MHz 30/300/3kW FSD. 3W sensitivity for FSD. Single sensor 0.1dB insertion loss. PEP/RMS £99.95 C

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

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

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

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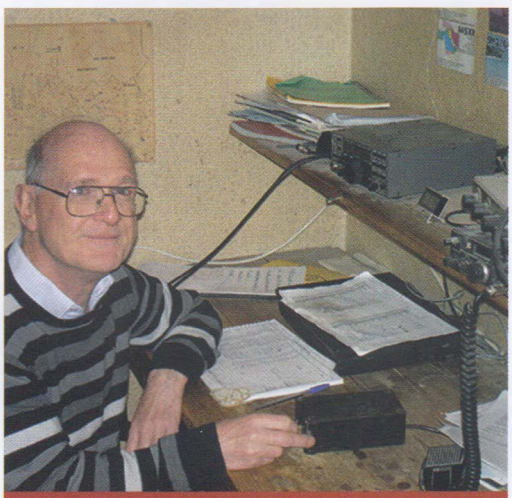

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Photo: Henryk, SM0JHF

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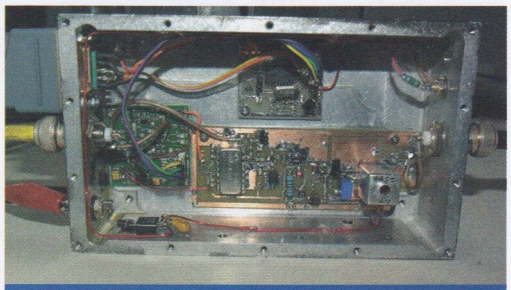


VHF beacon driver source – P34

Newcomers' newsletter

Following the announcement last month about the RSGB newcomers' newsletter, lots of Members have signed up to this new service.

The first issue of the newcomers' electronic newsletter will be sent out mid February. Written by *RadCom* author Steve Nichols, G0KYA, subjects covered in the opening e-mail include Using the QSL Bureau, Morse code, PSK31 and WSPR. Any Member can now sign up to receive the e-mail at www.rsgb.org/gettingstarted.

Air Cadets go on air

Recently, personnel from No 2500 (St Neots) Squadron ATC took on the roles of car parking marshals, assisting in unloading and setting up duties at this year's Huntingdon Amateur Radio Society (HARS) annual amateur radio rally. In recognition for providing assistance, a team of club members demonstrated various practical presentations covering HF operating, how to gain a UK amateur radio licence, VHF & UHF repeater operation and, finally, how to connect a laptop PC to a radio to decode PSK31.

The 30+ cadets were divided up into four groups and had an opportunity to view and listen to each presentation. The squadron looks forward to offering further assistance to HARS in future planned activities. When HARS attended the squadron, they also made a donation to squadron funds for helping out at the rally, which was received by Cadet Sgt Taylor Curtis. The squadron already has three members that are Foundation licence holders and will be running more radio courses during the coming year.

L-R: Steve Watson, David Leech, David Howlett and Sgt Taylor Curtis.

G2FKZ legacy

The Propagation Studies Committee has selected a suitable project for part of the legacy from the late Charlie Newton, G2FKZ. He left the RSGB £3,000 with the request that £1,000 of it be used to fund a project selected by the PSC. As a result, two applications were received. One, Noise Measurement equipment, was declined as a better-specified project is already being worked on.

The successful application was from John, G4BAO for funding of £500 to support the GB3WGI 2m transatlantic beacon. The team is currently in the process of building and installing a 144MHz beacon transmitter in the west of Northern Ireland to study transatlantic VHF propagation paths over the North Atlantic. They currently have a transmitter, an agreed site to host the beacon, a NoV and the callsign GB3WGI; antennas are under test.

5MHz news

In the first activity of its kind from Sweden, Johan, SM0TSC has been awarded an experimental licence to operate on 5MHz on four 3kHz wide frequency channels with a maximum power of 100W. The channels allocated are 5310, 5320, 5380 and 5390kHz. Please note that these frequencies are the USB voice dial frequencies, the channel centre frequencies being 1.5kHz higher. Although UK amateurs have seen a substantial increase in 5MHz spectrum since the New Year, unfortunately the only one of the channels common to both Sweden and the UK is 5320kHz. Johan's experimental licence runs initially for a six-month period and he welcomes skeds in any mode. He can be contacted via sm0tsc@hflink.net.

Amateurs in the Republic of Ireland who are active on 5MHz have been given the opportunity to apply for three new 5MHz channels to add to their special licences. These new channels are centred on 5300, 5332 and 5348kHz and are a result of several years' dialogue between IRTS and their regulator, ComReg. This brings to six the number of 5MHz channels available to EI amateurs, namely 5280, 5300, 5332, 5348, 5400 and 5405kHz.

NEWS IN BRIEF

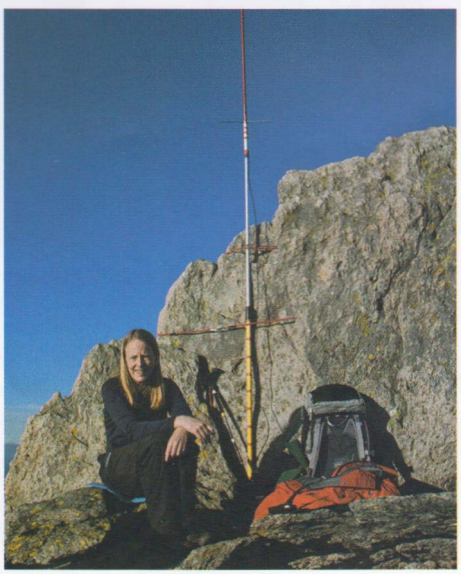
- The 64th annual International DX Convention takes place from 19 to 21 April in Visalia, California. It is at a new, larger venue with more traders and more presentations. Early registration closes on 10 April. www.dxconvention.org

SOTA news

Steve, G1INK, from Buxton, has become only the 6th person to have activated all 182* summits in the England (G) SOTA association (*182 = 176 current SOTA summits, plus 6 former, now deleted summits). In total, Steve has now activated over 500 summits in seven different countries. His final summit to 'complete' England was Brightstone Down G/SE-012 (214m) on the Isle of Wight, on 20 January.

Three UK radio amateurs have recently achieved the coveted Mountain Goat award for achieving 1000 points for activating summits. Phil, G4OBK from Pickering, North Yorkshire, started out by activating a handful of lower (1 point) Scottish hills in the summer of 2005. He has since become a prolific activator and portable operator and became a Mountain Goat on the summit of Great Sugar Loaf EI/IE-022 (501m) in Co Wicklow, Ireland. He used 30m CW, 20m SSB & CW and 2m FM to make 71 contacts on this activation. Karen, 2E0XYL from Ness in Cheshire, became a SOTA Mountain Goat on 9 January. She activated the summit of Glyder Fawr GW/NW-003 (1001m) in Snowdonia, making 59 QSOs on 2m FM and 23cm FM. The photo shows Karen and her antenna on Glyder Fawr on a beautiful winter's day.

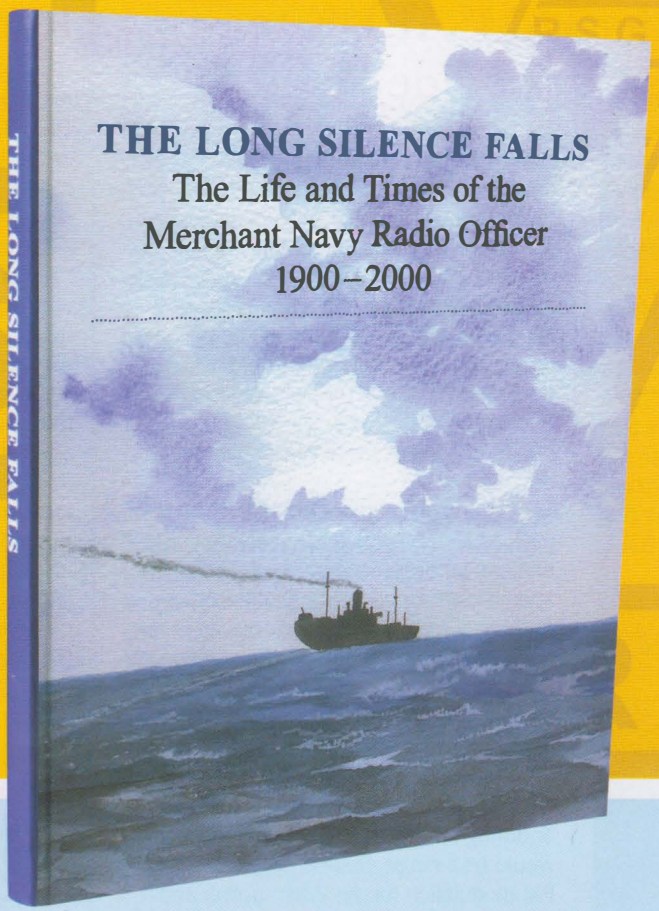
Barry, MW0IML commenced SOTA activating in January 2011 with his Foundation call of MW6BDV. He has concentrated all his SOTA efforts so far in the North Wales (GW/NW) and Lake District (G/LD) regions. Barry also made quick progress through the licensing structure, recording activations as 2W0LYD and his current Full call MW0IML. His Mountain Goat activation took place on 21 January on the summit of Carnedd Llewelyn GW/NW-002 (1064m). Barry made 29 QSOs using 2m FM and 23cm FM. www.sota.org.uk



RSGB shop

P&P FROM FREE
see page 76 for full details

NEW



E&OE All prices shown plus p&p

The Long Silence Falls

The Life and Times of the Merchant Navy Radio Officer

1900 - 2000

From the very earliest days of radio, ships have carried Radio Officers. However, with the onward march of technology this post has become redundant and since 2000 ships no longer carry specialist Radio Officers. This book is a look at 100 years of Radio Officers from the heyday of Marconi through to the turn of the millennium.

The Long Silence Falls is a series of stories which are broken down into various sections covering topics from training to life at sea. Written by the radio officers themselves, each section contains a wide variety of articles covering the topic. Readers will find out about their first trips, war stories, life 'East of Suez' and even a host of humorous tales that many a 'Sparky' will recognise. There are tales from aboard the various Queen Ocean liners that graced the Atlantic and further afield, alongside supplementary tales, such as the true account of the first use of the SOS signal. Most stories are post WWII but there is much of the longer history of Marconi men and the wider history of Radio Officers.

This high quality hardback book has been published Radio Officers Association and reflects the wide experience of their members over the years. At over 300 pages *The Long Silence Falls* is an extensive book and extraordinary glimpse into the practice and art of the Radio Officer. If you are fascinated by this now past age, this book is hugely interesting and thoroughly recommended.

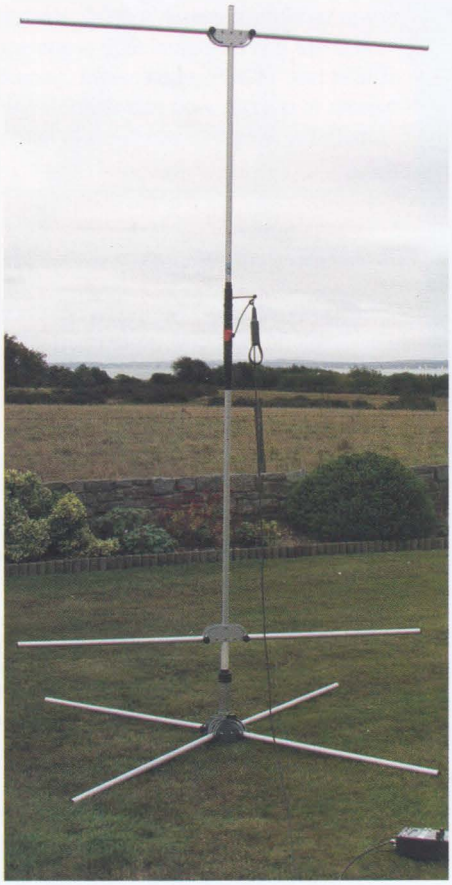
Hardback, Size 225x280mm, 304 pages

Non Members £24.99
RSGB Members £19.99 (20% off)

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

The I-PRO Traveller

Pro Antennas have told *RadCom* that the I-Pro Traveller HF portable antenna is back. Now built in Germany to a high standard, the specification is identical to the model used in the June 2010 *RadCom* review. Details from Carl at Pro Antennas on 01489 789 960 or online at www.proantennas.co.uk.



AMSAT-UK to provide Payload

AMSAT-UK will be providing a FM transponder and a BPSK telemetry beacon for the European Student Earth Orbiter (ESEO). The satellite will have a mass of 40kg, measure 33 x 33 x 63cm and is planned to launch in 2015-16 into a low Earth orbit. Nine European universities will be working on the mission. Cranfield University in Bedfordshire will be supplying a small sail that will be deployed to demonstrate the de-orbiting of spacecraft at the end of the mission.

The primary purpose of the AMSAT-UK payload is to provide a telemetry downlink that can be easily received by schools and colleges for educational outreach purposes. The data will be displayed in an attractive format and provide stimulation and encouragement for students to become interested in all STEM subjects in a unique way. The secondary purpose of the payload is to provide a transponder for use by individual radio amateurs around the world at night or during holiday periods. This transponder would be a single channel system using FM modulation for the 23cm uplink and 2m downlink.

For schools the ground segment will typically consist of a turnstile (crossed dipole) antenna with an active filter. This will feed the 145MHz downlink signal to a FUNcube Dongle SDR PRO receiver which plugs into any Windows PC or laptop. To display the telemetry, suitable display software will be developed together with a central data warehouse to enable schools to access data from prior orbits over the internet.

Kenwood TS-990S

Kenwood will see deliveries of the new TS-990S HF/50MHz transceiver arrive in the UK later this month. The TS-990 comes equipped with dual receivers that respond to simultaneous dual reception on different bands and also features a narrow-band roofing filter on the main receiver with a full down-conversion configuration. It has achieved the highest basic reception performance in the TS series, through the selection of circuits and components for their high performance and accelerating analysis using a triple DSP configuration.

In common with other manufacturers' top-end rigs, the TS-990S is not boxed at the factory with a microphone. As an introductory promotion, Kenwood will supply an MC-43S hand mic for each radio for the first three months of sales (February to April). A review, by Peter Hart, G3SJX, will appear in *RadCom* at the earliest opportunity.

NEWS IN BRIEF

- The Coventry Observer recently ran a story on the late President of the Coventry Amateur Radio Society, Secret Listener Arthur Noakes, G2FTK, whose equipment is held in the Herbert Art Gallery and Museum's collection.

  Arthur was one of a handful of secret listeners in Coventry. Soon after World War II broke out two officials visited Arthur at home and asked him if he knew Morse code and wanted to help the war effort. Arthur said yes to both and was recruited to work for the government and issued with a National Radio HRO set. Throughout the war Arthur listened to enemy communications for two hours a day on evenings and weekends. He believed the stations he listened to were in Belgium and Holland and that many of the messages were about German troop movements.
- In the new Alpha DX Antenna manual they now include a set of Upper & Lower Band stickers for each band that can be applied to the tuning bastion. This makes clips placement faster and easier after the correct match is found for the coax each operator chooses to use.
- A new group has been formed on Facebook for amateurs wishing to organise skeds with other amateurs. So if you need a particular contact for an award, or just a chat, then go to www.facebook.com/groups/hamsked and have a look.
- ML&S are holding a special Yaesu FTdx3000 Day on Saturday 23 February. This new HF & 6m transceiver from Yaesu is the latest in a long line of base station equipment from the Japanese manufacturer. On this Day ML&S will be paying special attention to this new model, with live demonstrations. Each FTdx3000 sold will be accompanied by Yaesu freebies and there are refreshments. Doors open from 9am to 4.30pm.

Bletchley RSS Reunion

The Radio Security Service will hold its 17th reunion at Bletchley Park on 14 April. Proceedings start at 11am. All are welcome. The reunions are held to commemorate the 1,500+ radio amateurs who used their special skills in the greatest secrecy in WW2 to monitor the German Secret Service and thus facilitate numerous deceptions contributing to military successes especially on D-Day. There will be a series of presentations and there will be the opportunity to visit Hut One to view the large collection of communication equipment from the past.

Booking is not required but, if you have not attended previously, it will be helpful if you can let Stan Ames know if you hope to attend by e-mail to RSSreunion@aol.com. www.secretlisteners.org

New Beginnings

Whilst our personal New Year resolutions may have already floundered on the rocks of 'good intentions', 2013 is already seeing a number of new initiatives for the RSGB. All are part of the 2011 Vision for the RSGB and amateur radio in the UK. The first fruits of the strategy that the Interim Board has developed and on which we have consulted with you, the Members, are being put into action.

GETTING STARTED. Feel like trying something new? Or just getting started in amateur radio? For you we have launched a new section of the website called 'Getting started' (www.rsgb.org/gettingstarted) that aims to provide advice and guidance to the newcomer (or returner) to amateur radio. In the same vein, this month sees the first edition of an e-mail newsletter that will be sent to any member who signs up to receive it, again aimed at providing basic information. This will be e-mailed six times per year.

NEW WEBSITE. And have you had a look at the new website (www.rsgb.org/beta)? The new website is now open for members to explore and I am grateful to those of you who have taken the time and trouble to provide feedback on how it might be improved and developed. Keep the ideas coming in. Members told us that the existing site was sometimes difficult to use and out of date and the new site addresses those criticisms. We need your help in giving the new site a thorough stress test and, if you have time to spare between 2000 and 2100UTC on 27 February, please login to the new site and use it.

CENTENARY. We begin our next 100 years on 5 July and we will be marking this milestone with a celebration centred on the NRC at Bletchley Park. I hope that many of you will be able to join us – further details will follow.

With the Centenary station, G100RSGB, in full swing, have you managed to work it or has your club put on a demonstration station to celebrate? Maybe you have had some initial thoughts about a project for the Construction Competition.

Have a look at the Centenary update on page 12 where you will see that in addition to putting the Anniversary Day into your diary you might want to consider doing something locally for the BBQ-on-the-Air on Saturday 6 July. This event is purposely chosen to coincide with the set-up time for the Centenary VHF National Field Day that weekend, perhaps turning it into more of a celebration.

AGM. Finally, there is an important new beginning on 20 April. This is the date of the AGM that will be held at the IET in London and will see the creation of a new Board. Further details will appear in next month's *RadCom* about voting arrangements.

Bob Whelan, G3PJT
RSGB Chairman

We apologise to Mr K G Thompson, G3AMF whose name didn't appear in the Honour Roll in February 2013. He has 67 years of unbroken RSGB Membership on 31 December 2013. We also apologise to Prof Martin Harrison, G3USF, who was erroneously listed as having a Knighthood.

WELCOME

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

Mr D Neville, 2E0BCJ
Mr D M Aldridge, 2E0DMA
Mr M J Firth, 2E0FIR
Mr L S Allcock, 2E0MCS
Mr R K Hampson, 2E0SON
Mr W R Millington, 2E0TGB
Mr P D Marney, 2E1PDM
Mr R Emerson, 2I0OTC
Dr H Rapp, DL1HEL
Mr C L Davies, EI8GFB
Mr M G Cook, G0TPO
Mr A J Quince, G0UBX
Mr B F Start, G1GLZ
Mr M Courcoux, G3EBP
Mr R Bell, G3RTB
Mr R Swetmore, G3VTE
Mrs J Hirst, G4APO
Mr D J Aldridge, G4JHT
Mr I R Lambert, G4LWG
Ms N Terry, G4YTI
Mr J A Glennon, G4ZQK
Mr S Kimber, G6ARR
Mr D Mallalieu-Howard G6LVS
Mr G Wratten, G6MAR
Mr D F Bleakley, G6XCF
Mr A B Mould, G7FAZ
Mr T W Walsh, G7VZS
Mr S Larson, GM4CLQ
Mr I R Robinson, GW1AWH
Mr R Oppio, I3EJ
Mr U Arcidiaco, IK2TYL
Mr M Karcich, K2ZD
Mr G R Joyner, KD4QMY
Mr M Pearce, M0GYH
Mr J Simpson, M0JMS
Mr P Burgess, M0PBT
Mr N P Holland, M1NPH
Mr P Stone, M3UER
Mr M Archer, M6BKV
Mr J Schleswick, M6CDT
Miss S Ward, M6CFP
Mr R Last, M6CHV
Mr G G Brotherhood, M6CIU
Mr D J Polley, M6CSK
Mr D Neville, M6DJN
Mr D H Hallsworth, M6DLL
Mr I Yovchev, M6IVO
Mr A Watts, M6KWH
Mr C McKenzie, M6MEY
Mr J Glicklich, M6NAV
Mr D M Bridson, M6PIA
Mr J Rose, M6RJL
Mr G P Hirst, M6RKR
Mr T J Kamps, M6TJK
Mr D Barton, M6TTA
Mr M Attenborough, M6TYO
Mr N Evetts, M6UBS
Mr S Keating-Fry, M6XKX
Mr T Cooper, M6ZRT
Mr C W Gardner, MI3FBX
Mr G Guida, MJ6GCU
Mr C King, MM0HOL
Mr R Gilchrist, MM6CHV
Mr J R Storeton-West, MM6ZDX
Mr S Williams, MW6CCG
Mr J B Baldwin, MW6JCV
Mr M Johns, MW6TBU
Mr G R P Pritchard, MW6URC
Ms R L Bowen, MW6ZOL
Mr V Behal, OK2TNL
Ms G W Van der Sterre, PD0GWS
Mr C R Pulford, RS212469
Mr J Willcocks, RS207802
Mr R Lang, RS210400
Mr G K Smith, RS211863
Mrs A Coomber, RS211952
Mr J Rymer, RS212187
Mr P Greenaway, RS212194
Mr J L Coutarel, RS212246
Mr J M H Taylor, RS212249
Mr A R Hunter, RS212280
Mr D Buckley, RS212311
Mr R M Fearn, RS212318
Mr J C Stanley, RS212323
Mr W B Shafer, RS212329
Mrs P Aldridge, RS212339
Mr C J Willson, RS212378
Mr A Angus, RS212389
Mr K Daniels, RS212391
Dr R Mackie, RS212407
Mr W Dickson, RS212414
Mr B Fitzgerald-O'Connor, RS212421
Mr T Sener, RS212438
Mr S A R Legg, RS212479
Mr B Andersson, SM0KBW
Mr T Stefansson, TF4M
Mr P Shields, VK2CPR
Mr R Schwenk, W2XL
Mr B Huth PhD, W4BGH

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

Mr M Winward, 2E0RCX
Mr J Berrisford, 2E0RLG
Mr P W Johnson, 2E0TXT
Mr J A Lewis, 2W0CDY
Mr M J Amos, G0ACD
Mr R D Gilling, G0AHV
Mr R D Rennolds, G0BXS
Mr H P Grandfield, G0DOU
Mr W Pattinson, G0JCK
Mr A J Spry, G0KDY
Mr M J Bridges, G0LLC
Mr P Waite, G0PWZ
Mr K W Griffiths, G1VQN
Mr M J Brown, G3UDP
Mr R W Swannell, G3XFA
Mr L Dixon, G3XXQ
Mr D M Griffiths, G4DMG
Mr M C Hall, G4GSB
Mr D H L Fagan, G4OTU
Mr J H Niman, G8GAJ
Mr J F Wheeler, GM0UYZ
Mr R D Jones, GM1MYF
Mr J M Pumford-Green, GM4SLV
Sutherland & District ARC, GS0IYP
Mr J I Swann, M0BUY
Mr M J Farrimond, M0HGH
Mr K Gamble, M0KIG
Mr B Wilson, M1VLS
Mr K Olssen, M3KAO
Mr J E Withers, M3WIT
Mr D M Peck, M6AOC
Mr M A Furnivall, M6FAY
Mr P G Waddington, M6WAD
Mr J Stewart, MM3FWQ
Mr P A McArthur, MM3HYG
Mr O Chadsey, N6OZI
Mr J Depijpere, ON7NP
E Jespers, ON7UN
Mr J Baldock, RS162951
Mr W P Guini, RS204146
Mr M Zgadzaj, SP6NIN
Mr R J Sargeant, VK4XRS

Promoting Amateur Radio

BACKGROUND. As part of its Primary Strategies, the RSGB is committed to promote, develop and defend amateur radio in the UK.

There are many aspects to promotion and our work in this area is constrained only by the budget and volunteer time we have available, because professional expertise is so expensive and without guarantee of result. Indeed, promotion is at the heart of most of the things we do from the Centenary celebrations to promotional videos to our work with Ofcom and IARU.

Promotion is part of our overall Marketing Strategy and work that we have carried out suggests that, when trying to attract newcomers into amateur radio, we should concentrate on:

- Young people between 8 and 13,
- People between 40 to 60,
- People who like to find out how things work, build them, modify them, and who have the resources to be able to do so,
- People who like to seek out new technical things and experiences, wanting to expand their knowledge; and again have the resources to do so.

Promotion of the RSGB and the services it offers to people already in the hobby is another aspect, but is not the prime purpose of this article.

We are constantly seeking to expand our impact and, following an appeal in the November 2012 *RadCom*, we have a small group of volunteers who are developing specific promotional material and activities at a local level. We have also developed a Promotion Plan for 2013 and this is available on the website www.rsgb.org/promotion.

In one sense, promotion of amateur radio as a 21st century hobby and interest is everyone's business but there are clear roles for the RSGB nationally and for clubs locally. We call this 'outreach'.

An important aspect of outreach is our participation in the educational process that introduces young people to radiocommunications technology. To achieve this, the Society, in conjunction with the RCF, invested in the GB4FUN concept – a mobile classroom that was designed to 'take the science to children'. However, this has not had as much impact in the educational arena as we had hoped and the mobile classroom is not appropriate for the other group of people we wish to attract – those in middle age. We have thus taken the decision that new ways must be found to handle such educational outreach.

A NEW APPROACH. We are beginning this new approach to outreach at the National Radio Centre (NRC) at Bletchley Park. This year, we will become an integral part of the schools educational programme at Bletchley Park, providing teaching at the NRC to children about the science of radiocommunication.

As resources allow, we will extend this approach to other science-based venues where children visit as part of the school curriculum. Our aim is to provide a high quality learning experience supported by experienced teaching resources. We intend to develop a 'learning package' that will either be a static part of a venue or will move between venues, but will always be an integral part of the site.

We also believe that such experiences will be attractive to our other target markets of 40 to 60 year olds outside the educational arena, as they also visit such venues with or without children. These target markets will also require support using other means, as outlined in the Promotion Plan.

Embedding such an exhibit in a venue will have to meet challenging standards if it is to fulfil its potential and we will need the support of teachers and other volunteers, including local clubs and individual members in developing and maintaining material.

This change of emphasis in our promotion activities means that the existing mobile GB4FUN demonstration unit will no longer be of use for the purpose for which it was designed. Apart from the challenges of keeping the vehicle on the road and available on an organised basis throughout the UK, we believe that our new approach to outreach has a greater chance of making a sustainable impact on the markets we seek to serve.

We have therefore decided that RSGB national outreach is best served by disposing of the GB4FUN mobile demonstration unit and concentrating on our new approach of 'bringing people to the science'. The Society is therefore offering to donate the unit to a club (or clubs) with the intention that it will continue to be used by them in some way for the promotion of amateur radio locally rather nationally.

Expressions of interest for taking ownership of the mobile demonstration unit are now invited. Applicants should indicate how the unit will be used and how it will promote amateur radio. The unit will be donated by the RSGB to the successful applicant (or applicants) and the recipient(s) will be responsible for all further expenditure associated with its use. It is anticipated that applicants will be a local club or group of clubs.

The GB4FUN callsign will remain with the RSGB and it is important to note that the donated equipment currently within the unit may be reclaimed by the donors.

Further information is available from RSGB General Manager, Graham Coomber, G0NBI by e-mail to graham.coomber@rsgb.org.uk.

Software Programming Support

The IT support for the IOTA programme is engaged in the beta testing of a ADIF log upload module on a live test server, and additional software support is required to assist Dom Smith, MOBLF, with this process as well as other developments on the IOTA site. The ideal candidate would have skills that include object oriented PHP, MySQL, Javascript (and associated technologies such as AJAX, JSON, jQuery, etc) and be familiar with working in a GitHub collaborative environment.

A team worker, comfortable with virtual collaborative working, would be essential. Whilst someone resident in the UK would be an advantage, consideration will be given to overseas applicants.

Expressions of interest, with a brief CV, should be sent to John Gould, G3WKL, g3wkl@btinternet.com.

AGM 2013

The 86th RSGB AGM will be held at the IET, 2 Savoy Place, London WC2R 0BL on 20 April 2013. The meeting will start at 12 noon. The formal Calling Notice will appear in the April issue of *RadCom*.

CONGRATULATIONS

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

60 years

Mr M H Walters	G3JVL

50 years

Mr D W Aslin	G3WGN
Mr R H Crowe	G3RVA
Mr B J Giddings	G1JLG
Rev G A Stanton	G3SCV
Mr J H Tait	GW8MGF
Mr D A Whitaker	BRS25429

QSL Matters

NEW 2M SERIES MANAGER. Thanks to a good response to our appeal for volunteers, we are pleased to announce that Steve, MM0SGQ (ex-2M0SGQ) is the new manager for Scotland. His details are listed on the RSGB website. All cards and envelopes have been transferred to Steve and he is working his way through the backlog. Members with 2M calls, both past and currently active are encouraged to send 2nd class stamped envelopes to him as soon as possible.

2E SERIES MANAGER STILL WANTED. Are you an active 2E Series call holder in England, with space and time to sort and distribute around 12,000 cards each quarter, to fellow members? If you have an interest in helping others and some free space, this could be a rewarding opportunity. The ideal candidate needs to be available by e-mail, have some basic Excel spreadsheet knowledge and a little patience. Interested? Please e-mail the bureau.

REPEAT QSL CARDS. For some time now we have been encouraging QSL enthusiasts to make more use of the OQRS system to request a card from a worked station where this excellent facility is available – it pays to check first – rather than use a scatter-gun approach sending cards to every station in the log. For some stations, such as G100RSGB you can apply for a QSL card following your contact on the web, but only if you want a card.

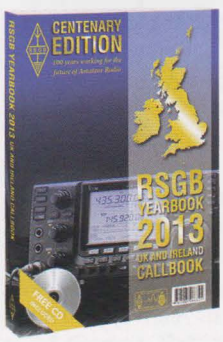
QSLing every contact can prove a fruitless and costly exercise as some stations are either not members of their national bureaus, don't QSL, only QSL direct or use a personal manager, often in another country. We see many repeat request cards and Tim, M0URX has alerted us to a new and growing trend. He has become aware that many stations with OQRS are failing to update that a QSL has been sent. This leads to much duplication of effort with more cards being sent, clogging up the bureaus.

SPECIAL PREFIX CARDS R, Q, AND O. Martin, G0VXC has asked us to remind users of the Special Prefixes, that the latest batch of uncollected cards is due for disposal in the next 30 days. If you operated with any of the above prefixes and have not lodged collection envelopes with him for your R, Q or O prefix, time is running out. Please make sure that he has C5 envelopes with your callsign and membership number clearly marked in the top left hand corner to avoid disappointment.

CANADIAN BUREAU. Are you sending your QSL cards for VE direct to their bureau? Effective immediately these should now only be sent to: RAC National Incoming QSL Bureau, Box 51, Saint John, NB, E2L 3X1, Canada.

Yearbook Editor Vacancy

The RSGB is looking for a new editor for the annual publication, the RSGB Yearbook. Ideally, the editor should be a licensed amateur with DTP experience as well as good organisational skill.



Please send a brief CV to the RSGB by e-mail to yearbook@rsgb.org.uk.

Elections 2013

MEMBER-ELECTED DIRECTORS. Under the revised Memorandum, Articles and Bylaws (approved at the 2012 EGM) there is provision for four elected Directors. We have received verified applications from three candidates, who are:

Graham Murchie, G4FSG
Dr John Rogers, M0JAV
Len Paget, GM0ONX

Full details and candidate statements will appear in the April *RadCom*.

The above three candidates will be appointed unopposed. The remaining vacancy may be filled by co-option by the new Board, which takes over from the Interim Board immediately following the 2013 AGM.

NOMINATED DIRECTORS. Under the revised Memorandum, Articles and Bylaws (approved at the 2012 EGM) there is provision for three Nominated Directors. The Nominations Committee has started work to identify the three nominated Directors. Their names will be published in the April *RadCom* and put forward for membership approval at the forthcoming AGM.

THE PRESIDENT. No nominations have been received for the post of President. It is the intention of the Interim Board, working with the new Board members, to fill this important post by co-option for a period of one year. The Interim Board asks members to consider making proposals for this position and suggestions should be forwarded to the Company Secretary, Rupert Thorogood, G3KKT by e-mail to g3kkt@rsgb.org.uk as soon as possible.

Thanks

We would like to thank all those who have looked at the new website and who have left comments, constructive criticism and ideas. Many of these are being incorporated into the new website ready for the final launch. We would ask Members for a little more help with the website development – can you try and break it! On February 27 from 8 to 9pm, we would like as many Members as possible to explore the new website at www.rsgb.org/beta so we can test the resilience of the site.

More on the Centenary events

Gx100RSGB. At the time of writing, the operation of the Centenary station in the North West of England has drawn to a close and the action moved to North Scotland and the Northern Isles. For March, the operation moves to North East England. For both of these two Regional operations we will see more of a mix of operating with national clubs, such as the GMDX Group, or local contest or DX groups taking a turn.

Much was said on the internet around the time of the GD100RSGB operation in January when the winter decided to throw its worst at many of us, not least resulting in terms of snow static for some of us trying to hear them! Dave, 2D0YLX, Chairman of the Isle of Man ARS wrote to me with an account of their two days of their public event at the Sea Terminal in Douglas. On the day, the RF noise from the terminal as well as interference from the Harbour radar and radio system was far worse than found at their recce visit and this resulted in Top Band and 80m being completely unusable, with only a small window for 40m on each of the two days. Even on 20m, where European stations were S9+ signals, Dave reported that they were still living with S8-9 of QRM. Despite S9 of noise on 17m, the team worked more than 400 stations on CW. 15m saw a mix of SSB, CW and PSK31. Whilst 2m SSB proved profitable, 6m and 50cm produced no takers.

We are pleased to be able to say that we are able to offer the Isle of Man ARS another opportunity to use the GD100RSGB station callsign in gaps during the allocation to Region 4, NE England. This time the club will use a more favourable location, with the aim of maximising QSOs in the log especially on the bands that couldn't be used last time. Further information will be provided on the Centenary website, but look out for the station on Mondays 4 and 11 March.

For many, getting the necessary points for the Centenary Award isn't too much of a challenge over a 12 month timeframe, at least for the Basic Award. The Centenary station will be nearby, or at the right skip-distance, at various times of the year. The idea of the Centenary station is fun – every day or so a different location, style and focus of operation, sometimes a pileup on one of the DX bands other days maybe more of a relaxed 'ragchew' on 40m, SSTV, moonbounce, etc. Whether an operator or a chaser, it's a chance for us to all consider trying out something different and in the process learning something new.

ANNIVERSARY DAY. Friday 5 July is a date to put into your diaries, especially if you are able to consider travelling to Bletchley Park, Buckinghamshire. The Bletchley Park Trust has very kindly agreed to allow us to centre our Anniversary Day celebrations around our National Radio Centre (NRC) as well as some special events in the Mansion and in grounds of the Park – and also enjoy the usual attractions.

We have some limitations in terms of guests for the formal parts of the event because of the size of the NRC and in the Mansion. We have yet to finalise the details for this, but we plan for this to be an attractive day for partners, children and friends to take part in the wider event, visit the NRC, and the other attractions. We will publish more detail in April or May *RadCom*.

CENTENARY AWARD. John Dunnington, G3LZQ, RSGB Awards Manager, and I have received quite a lot of e-mails about this award. The most common question is regarding the required number of contacts with the Centenary station as it moves between the RSGB Regions. The term Region/Bands is used to signify the number of different Regions and Bands, so Region 3 on 40m, Region 3 on 80m and Region 2 on 40m would each qualify for a point (the same logic applies for the VHF/UHF bands). You can see your total by going to the "Am I in the Log" query on the "Online Log and QSL Information" page on the Centenary website and, if you scroll down from the Region/Band table, you can see the top 200 stations in rank order.

Note that, if you are chasing the Centenary station, in addition to the recent Cluster spots, which are available on the Centenary website (follow link to 'spots'), we have also implemented an 'Alert' system on the Centenary website, that is also linked to an RSS feed and to @G100RSGB on Twitter.

Having said that gaining the Basic Centenary Award isn't too much of a challenge over a 12 month timeframe, it is of significant merit that Peter Hart, G3SJX, completed the Basic HF Centenary Award in late January. Peter gained the necessary 7 Region/band contacts with the Centenary station, as well as exceeding the balance of the 250 points with 16 band/QSOs with UK IOTA Islands, 114 band/QSOs with Commonwealth call areas and 182 band/QSOs with ITU Zones. This incidentally included all 9 HF bands.

UK amateurs are reminded that this year is a good time to go on the air as people chasing this award will be looking for UK Commonwealth call areas (for HF), UK locators and UK DXCC (for VHF/UHF) and UK IOTAs (for both awards).

CENTENARY CHALLENGE. Amateurs may have worked or heard G100C, GM100C, etc, over recent weekends. This is a rather different style of operating as it is a special callsign that has been granted to the GR2HQ RSGB Team that provides the RSGB's HQ entry to the IARU Contest each year. The callsign, or its variant, as it moves between the UK DXCC prefix areas, will be operated most weekends during 2013 by different members of the team.

A separate award to the RSGB Centenary Award has been created to offer a slightly different operating challenge – we are calling this the RSGB Centenary Challenge. Free certificates will be issued to the leading stations in terms of band/mode slots for contacts with each of the GR2HQ Team's station (G100C, GC100C, etc).

CONTESTS & BBQ-ON-THE-AIR. The RSGB Contest Committee has designated two of this year's contests as Centenary Contests. These are the IOTA Contest and the VHF NFD, both in July. Some clubs already turn their VHF NFD into more of a family day, so we suggest that on Saturday 6 July, around midday, for these clubs and those that can set up their NFD stations early, there are informal contacts between clubs on the VHF & UHF bands whilst enjoying a BBQ. More details for this, suggestions on how to turn the event into a family and friends day as well as details of the two Centenary Contests will follow.

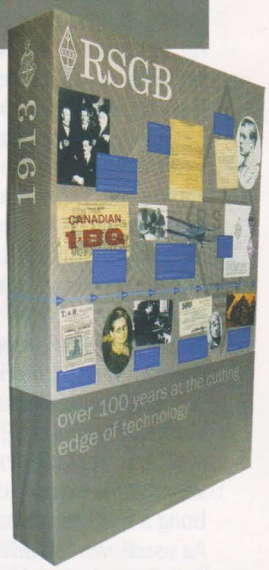
GX100RSGB OPERATIONS

26 Feb	Mexborough & District ARS
27 Feb	Grimsby ARS
28 Feb	York Radio Club
1 Mar	Humber Fortress Club
2-3 Mar	Tynemouth ARC
4 Mar	Isle of Man ARS (GD100RSGB)
5 Mar	Humber Fortress Club
6 Mar	Bishop Auckland Radio Amateurs Club
7 Mar	York Radio Club
8 Mar	Humber Fortress Club
9-10 Mar	Durham and District ARS,
11 Mar	Isle of Man ARS (GD100RSGB)
12 Mar	Humber Fortress Club
13 Mar	Maltby and District ARS,
14 Mar	Pontefract & DARS
15 Mar	Sheffield ARC
16-17 Mar	Otley ARS
18-19 Mar	Hornsea ARS
20-22 Mar	Denby Dale ARS
23-25 Mar	M2D East Yorkshire Contest Group
26 Mar	Norman Lockyer Observatory
27 Mar	Flight Refuelling ARS
28-29 Mar	Christchurch ARS
30-31 Mar	Plymouth RC & Saltash

CONSTRUCTION COMPETITION. Don't forget that your involvement in the celebrations are not just about operating and joining others at Bletchley Park on Anniversary Day. For the construction enthusiast and the technically minded, the rules for the Construction Competition have been on the Centenary website since December last year and hopefully minds and soldering irons are engaged.

HISTORY WALL. To bring the story of the 100 years of the RSGB to life and the to the amateur community as well as the general public, a special History Wall display (pictured) has been commissioned and is now ready for use. Designed to be easily transportable, this display for available for use at major events such as large rallies and the larger public Centenary station events. We are asking clubs to contribute towards its cost of carriage and insurance but if you would like to find out more, full information is available on the Centenary website.

The Wall of History will be seen at various events throughout the year.



CENTENARY PINS. To mark the Centenary in a more personal way, we are now making two different designs of lapel pins available to members. The basic Centenary logo pin (pictured left) is available free of charge to RSGB Members, upon submission of a small padded envelope with a large letter stamp to HQ, or by ordering online through the RSGB Shop and paying £1 to cover postage and package.

A different design is also being made available, which can be personalised with your callsign (see bottom of page). This design is a limited edition and can be ordered for only £6.99 including the engraving via the RSGB Shop, www.rsgbshop.org.

WEBSEARCH
Centenary Website:
www.rsgb.org/centenary/

Homebrew

Continuing our series of simple receiver projects

PROGRESSION. In the few months since we built the simplest possible 'crystal set' (September 2012), we have built several new receivers. Each of these was a little more complex than its predecessor. This is a deliberate strategy, designed to encourage newcomers or less experienced constructors to take on the task of building a receiver. As a general rule, receivers tend to be a bit more complicated than transmitters. If you can build a good receiver, you will have little difficulty building an equally good transmitter, transceiver or any other station equipment. My current equipment lineup consists almost entirely of items built for our monthly Homebrew construction projects. My microphone, iambic keyer, HF transceiver, VHF transverters, linear amplifiers, SWR/power meters, ATU, HF doublet aerial, balanced feeder and DC power supplies are all previous Homebrew projects.

The next stage in this progression from very simple to more complex projects is to build a high performance superhet receiver. As usual, we will take a modular approach to building the project. Some of the modules have already been designed, built and tested. Basic building blocks from our recent projects such as the RF band pass filter, mixer/product detector, VFO and AF amplifiers may be reused in the new superhet receiver.

As some of the key building blocks have not yet been built, I used an existing home made receiver to test the crystal ladder filter from last month's construction project. The 10MHz CW filter was grafted into this receiver in place of the 10.7MHz SSB filter used in the original project. The filter performed very well in these tests. I was pleased to find that this simple 3rd order (three crystals) 600Hz bandwidth (BW) CW filter was generally superior to the commercially made 8 pole 2.7kHz BW SSB filter when used for reception of CW signals on a noisy band. Encouraged by this success, I have also tested several 5th and 8th order ladder filters that were based on 10MHz crystals.

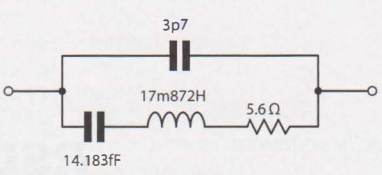


FIGURE 1: Electrical model of the 10MHz crystals used.

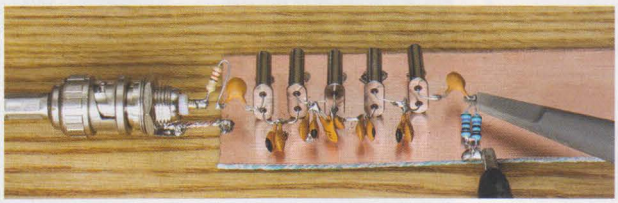


PHOTO 1: Prototype 5th order crystal filter.

Figure 1 shows the electrical model for the 10MHz crystals used in this month's filter designs. Methods of measuring crystal parameters were discussed last month. Cm and Lm values were calculated using a test oscillator (G3UUR method). The parallel plate capacitance Cp was measured directly using an L/C meter (May 2008). The resistance Rm was measured using the signal generator / power meter test rig described last month. The generator was tuned for peak voltage at the output load. This indicates the series resonance of the crystal. The crystal was then pulled from the test rig and replaced by a variable resistor. This resistor is adjusted so that the output voltage is exactly the same as the voltage produced when the crystal is in circuit. The value of the test resistance can then be read using an accurate multimeter. My test resistance is made up from a parallel combination of a 47Ω carbon film resistor and a simple 100Ω preset potentiometer. A simple 'skeleton' type pot like the Maplin WR38R miniature cermet pot is preferable to more elaborate multi-turn pots. The simpler and cheaper skeleton types usually have lower inductance than more complex devices. My test resistor is shown in **Figure 2.** It is not easy to make accurate Rm measurements in my 50Ω test rig. Typical values of Rm are in the 3-30Ω range. The lower end of this range is quite small compared to 50Ω. This calls for very accurate measurement of voltage at the output load. I used the average of many voltage samples measured using a digital oscilloscope. Rm measurement becomes much easier if a lower test rig impedance is used.

The values for my 10MHz crystals are Lm=14.183fF, Lm=17.872mH, Rm=5.6Ω and Cp=3.7pF. There is some small variation between crystals, so I have selected matched sets using the test oscillator and frequency counter. For the SSB filter, my goal was to have all crystals matched to within 100Hz. In practice, it was quite easy to find batches of 5-8 crystals matched to within 70Hz.

For the first attempt at building an SSB filter, I used the *Dishal* software by DJ6EV [1]. The *Dishal* software and many other ladder filter resources are available from the projects section of the Warrington ARC website at www.warc.org.uk. The filter was designed as a 5th order Chebychev with 0.1dB of passband ripple and a typical SSB bandwidth of 2.7kHz. This will pass the normal communications voice range from 300Hz to 3kHz. Chebychev (or Chebyshev) filters are a trade-off between stop band attenuation and pass band ripple. It is possible to increase stop band attenuation if a relatively high level of pass band ripple can be tolerated. In applications that call for a very flat pass band response, it is common practice to specify pass band ripple as 0.1dB. As this level of ripple is difficult to measure, for all practical purposes, it is equivalent to zero ripple. This comes at the expense of a slight reduction in stop band attenuation. As we are designing a complex filter with a relatively large number of resonators, we can easily achieve a suitable level of stop band attenuation for any given application. As a general rule of thumb, a filter with 4-6 crystals will have sufficient selectivity for use in an SSB transmitter or a simple receiver. For use in a high performance receiver, filters with 6-10 crystals are commonly used. The theoretical ultimate stop band attenuation of a typical 8th order crystal ladder filter is around 200dB. This is absolutely unachievable in practice because of dynamic range limitations within the filter and the other front end components. Even if the filter was infinitely strong and perfectly linear, there will always be some stray leakage around the filter. In practice, you can expect to achieve stop band attenuation in the 80-100dB range and pass band (insertion) loss in the 2-6dB range.

The *Dishal* software requires the series resonant frequency and either an Lm or Cm value for the crystal. The missing value is calculated automatically. The other required parameters are Cp, 3dB BW, ripple in dB and number of crystals. The filter I/O impedance, shunt coupling capacitor values (Ck) and

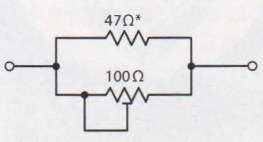


FIGURE 2: Test circuit used to determine Rm (* see text).

series tuning capacitor values (Cs) are displayed on an easy to read table. The filter response is plotted on a Bode-plot type of graph showing transfer vs frequency. *Dishal* is a Windows program, but I have found that it runs perfectly under the *Wine* Windows emulator on my Linux PC.

Filter I/O impedance for this type of ladder filter is proportional to the filter bandwidth. Last month's CW filter had an I/O impedance that was conveniently close to 50Ω. The 2.7kHz SSB filters described here have an optimum I/O impedance of approximately 300Ω. This is not too far removed from the I/O impedance of commercially made SSB filters, which are often designed for around 500Ω.

Some of the simplest crystal ladder filter designs use a minimum number of extra components. One popular variant generally known as the Cohn filter uses equal values for all of the shunt coupling capacitors (Ck). For those who are interested in experimenting with such filters, the *Dishal* filter software provides a Cohn filter design tool.

CONSTRUCTION. Our first filter is a 5th order Chebychev as mentioned earlier. The coupling capacitor values and I/O impedance are optimised to provide an almost perfect pass band shape. One problem that arises when using several different values for Ck is that each resonator in the filter has a slightly different resonant frequency when compared to its neighbours. This problem can be overcome by using series capacitors so that all resonators are tuned to the same frequency. *Dishal* automatically calculates the correct value for the series tuning capacitors.

While it is important to use the correct component values, extreme accuracy is not always required. The value of external capacitors is usually in the tens or hundreds of pF. This is extremely large compared to the femtoFarad (fF) capacitance of the crystal motional capacitance. This means that a relatively large error in capacitor values will often make little difference to the behaviour of the filter. In the likely event that the calculated capacitor values are not available, it will often be possible to use the nearest available standard value. Also keep in mind that there is little point in specifying component values

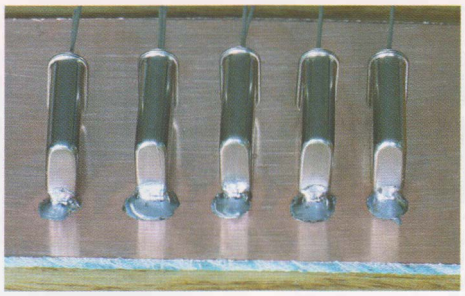


PHOTO 2: How the crystals were mounted.

with extreme accuracy if you use standard 5% or 10% tolerance components unless you are willing to take the time and trouble to accurately measure the value of each capacitor and hand-pick the ones that meet your requirements.

As an example, the series tuning capacitors Cs1 in my SSB filter have a calculated value of 80.6pF. As this is very close to a standard value of 82pF, I was happy to use the standard value instead. The other series tuning capacitor Cs3 has a calculated value of 258pF. As this is not close to any of the available standard values, I chose to use a parallel combination of 220pF and 33pF to give a value of 253pF. The schematic of the 5th order SSB filter is shown in **Figure 3**. Where parallel capacitors are used, the total capacitance is shown in brackets. The filter was simulated using *QUCS* first with the exact calculated values and then with the actual values in the schematic. This will hopefully show up any deficiency in my design before the filter is actually built. The *QUCS* plot is shown in **Figure 4**.

The filter was built on a strip of PCB laminate. This type of point-to-point construction is particularly well suited to crystal filter construction. **Photo 1** shows the completed filter. Note the very short leads and direct connections to ground for the shunt coupling capacitors.

The metal can of the crystal holder can be soldered directly to the copper ground plane. This provides a physically stable structure and a good ground connection for each crystal. Grounding each crystal holder tends to reduce unwanted leakage around the filter due to stray capacitive coupling between each crystal. The method of mounting the crystals is shown in **Photo 2**. Each crystal is solder tinned at the top corner only using a brief application of a very hot iron. Soldering at this location reduces the danger of damaging the seal at the pin end of the crystal.

In Photo 1 the filter is under test with a 280Ω output load made from a parallel pair of 560Ω resistors. A 220Ω resistor is placed in series with the input so that the 50Ω signal generator looks like a 270Ω source impedance.

The measured performance of the filter is remarkably close to the *Dishal* and *QUCS* models. The computer model predicts insertion loss of around 1dB; the real filter shows a very respectable insertion loss of just over 2dB. In the past, I have found that my Chebychev filters haven't quite achieved the specified passband ripple figures. The usual procedure is to specify a very low value like 0.1dB for ripple and then be prepared to tolerate a greater, but still insignificant passband ripple of 0.25 to 1.0dB. In this case, the filter showed no measurable ripple across the passband. The -1dB points are at 9.9970 and 9.9997MHz, giving a BW of exactly 2.7kHz. This is slightly wider than expected because the design specified a -3dB BW of 2.7kHz. Stopband attenuation is good enough to give 45-50dB attenuation 1kHz into the opposite sideband when used as an LSB filter. This makes this filter good enough for use in an SSB transmitter or a simple SSB receiver. Measuring stopband attenuation with a signal generator and spectrum analyser confirms the accuracy of the simulation (at least down to the analyser noise floor at -70dB).

AN 8TH ORDER SSB FILTER. For the next project, I built an 8th order SSB filter based on a matched set from the same batch of 10MHz crystals used in the 5th order design. The filter schematic is shown in **Figure 5**. As with the previous design, any inconvenient capacitor values are made from parallel pairs of standard values. This filter was built and tested using the same methods as employed for the previous design. The measured performance of the filter was again very close to the computer models. The -3dB BW was almost perfect at 2.8kHz. Skirt selectivity is improved so that opposite sideband attenuation is around 60dB at 1kHz when used as a USB filter and almost 80dB when used as a LSB filter. The difference is due to the steeper slope on the HF side of the filter passband.

IF AMPLIFIERS. Now that we have a small collection of IF filters, we will need a new IF amplifier before we can proceed with the final design for the superhet receiver. As this is something we have done several times in past projects, the easy option would be to recycle one of the older designs. Our previous IF amplifiers have been based on

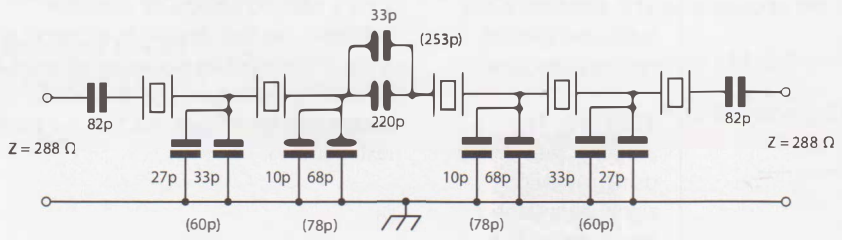


FIGURE 3: Circuit of the 5th order SSB filter.

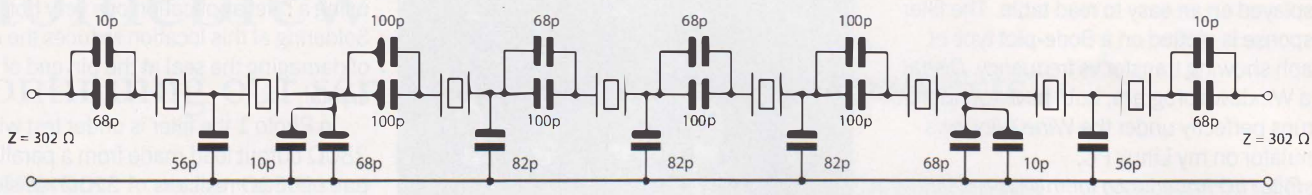


FIGURE 5: Circuit of the 8th order SSB filter.

the Analog Devices AD603 IF amplifier IC or discrete designs based on FET or dual-gate MOSFET devices (see June 2011). In the distant past, I have also used older devices like the MC1350P.

I have decided to try something different for this project. I bought a batch of TL026 ICs. This device is specified as a differential high frequency amplifier with AGC. The datasheet suggests the TL026 is particularly suitable for use as an IF or RF amplifier in radio and TV receivers. These are current production devices that are quite cheap and readily available. I haven't found any amateur radio applications for these devices. Perhaps this is because the TL026 is configured in a similar manner to an operational amplifier, designed for use with a split ± power supply where the two inputs are referenced to ground or 0VDC. This is slightly inconvenient when the amplifier is used in a radio with a 12VDC supply. As many amateur rigs are designed for mobile or portable operation from a 12V battery, a split power supply is not readily available. There are a number of options for working around this problem. IC-based negative supply generators are quite readily available. These are basically switching power supplies that take a single-ended DC supply and generate a split positive/negative DC supply. This is a viable option as long as you take care to filter the output of the switching regulator. You don't want to inject noise from the power supply into a sensitive circuit like an IF amplifier. A simpler and perhaps better option is to use a resistive divider to provide a DC voltage at approximately half the voltage of the single-ended DC supply. This can be used as a reference point for biasing the amplifier inputs. As IC amplifiers typically have very high input impedance, a very simple voltage divider consisting of just two resistors and a decoupling capacitor should suffice.

My test circuit for the TL026 is shown in Figure 6. The negative supply pin is wired directly to Gnd (0V). The positive supply pin is connected to the 12V DC supply. As the output of the amplifier is capacitively coupled, there are no problems with biasing the output circuit. Both the inverting and non-inverting inputs are referenced to approximately half of the supply voltage by a simple resistive divider. This is bypassed to ground using a 220nF capacitor. Bias is provided to both inputs via a pair of 6.8k resistors. Input and output coupling is handled by pairs of 10nF capacitors. Each input has been shunted by a 50Ω resistor. This component is made from a parallel pair of 100Ω carbon film resistors.

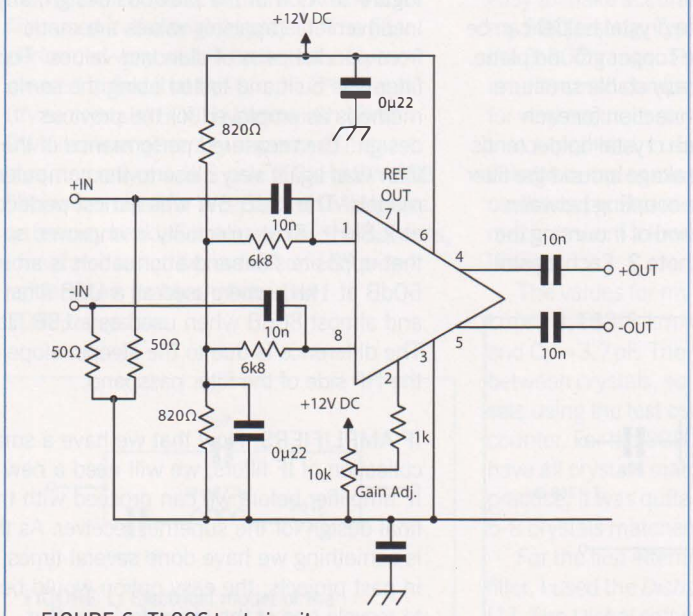


FIGURE 6: TL026 test circuit.

CONSTRUCTION.

The amplifier was built dead-bug style on a strip of PCB laminate. I used standard ceramic disc capacitors and 0.25W carbon film resistors. Construction is quite straightforward. As with any high gain amplifier, you should follow good HF/VHF practice. Keep leads and ground connections short.

TESTING. The amplifier was tested using my DDS signal generator and a switchable attenuator to provide the input signal. The output was measured into an open circuit, a 1k resistive load (as suggested in the datasheet) and also into the 50Ω input attenuator of my spectrum analyser. All tests were done using a single-ended 50Ω source into one of the two inputs. The circuit was well balanced in the sense that gain was the same regardless of which input was used. The datasheet suggests a typical voltage gain of 85 (or 38.5dB) assuming equal input and output impedance. Presumably this only applies in the case of a differential amplifier. In my test rig, the measured gain was just over 30dB with a 1k or open circuit load and just under 30dB with a 50Ω output load. I used a simple potentiometer to evaluate the performance of the gain control pin. This gives decreasing gain with increasing control voltage. A proper configuration of the gain control circuit would use the REF-OUT pin as a voltage reference. The datasheet suggests a typical control range of 50dB. This was easily achieved in practice. The outputs as observed on a dual-trace oscilloscope produce a well balanced pair of anti-phase signals with no detectable distortion.

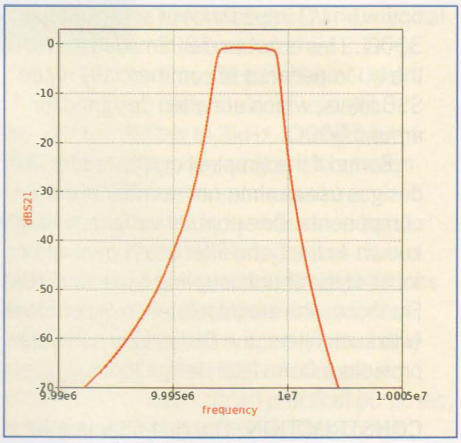


FIGURE 4: *QUCS* plot of 5th order SSB filter response.

It looks like this device should serve well as the IF amplifier for our superhet receiver. Generating the required range of AGC voltage may be difficult, but that is a job for next month.

NOTE

[1] I used the wrong callsign for Horst Steder, DJ6EV in last month's Homebrew. Humble apologies to both parties.

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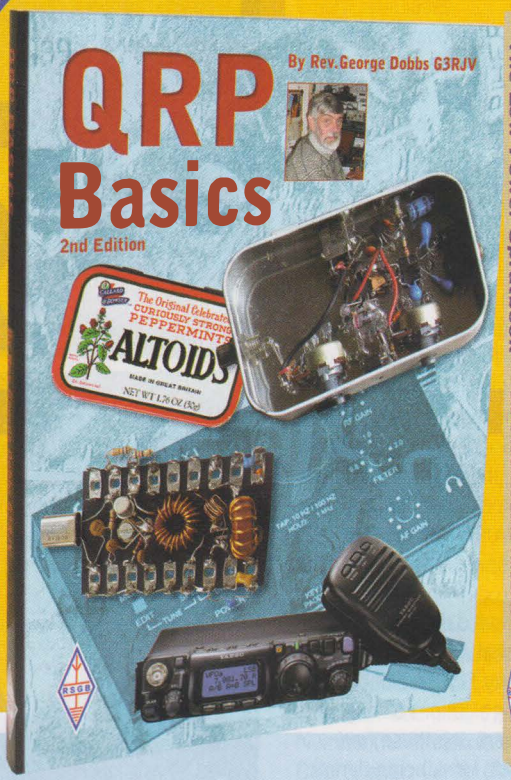

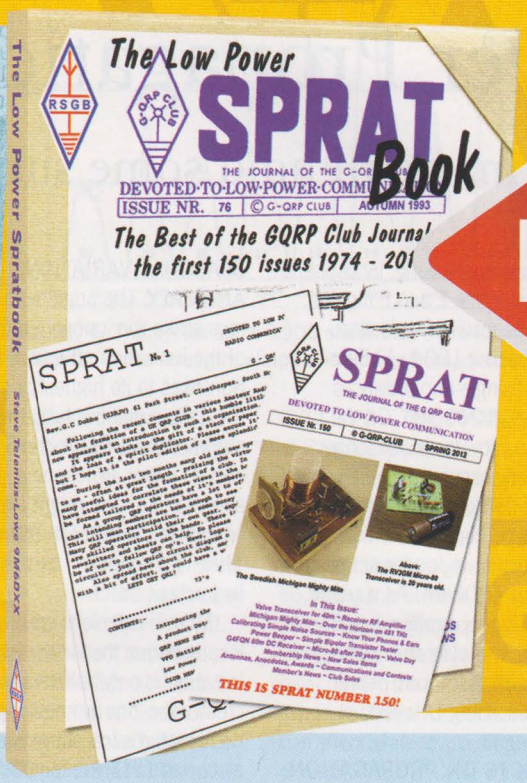

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Solar Cycles and F-Layer Propagation

Cycle 23 may still hold some surprises

INTRODUCTION. Generally speaking, ionospheric radio propagation occurs in the E and F regions. E layer propagation is the result of ionisation occurring at a height of about 100 to 115km. At this level, the longest single-hop distances are typically on the order of 2000km. On the other hand, the F region provides much longer propagation. This typically occurs in the F2 layer, which lies above about 250km, and frequently peaks around 350km (see **Figure 1**). This higher skip-point elevation results in longer single-hop distances, out to about 4000km. As a result, compared to E skip, F2 propagation usually results in longer paths and also stronger signals for the same overall path distances (fewer passes through the absorbing D layer).

SOLAR CYCLE IMPACTS ON PROPAGATION. The F region is ionised primarily by extreme ultraviolet (EUV) radiation from the Sun. The highest persistent levels of solar EUV are found during the maximum of the eleven-year solar activity cycle. The higher the EUV level is, the higher the ionisation and, consequently, the higher the maximum usable frequency (MUF). In addition, the higher ionisation also broadens the geographical area over which propagation can occur. So, there is a strong link between the solar cycle and F-layer propagation, particularly above about 10MHz. This is true for HF DX and especially for VHF DX, since F2 MUFs rarely exceed 50MHz, except during solar maximum. For the avid DXer, the key questions are: when will the maximum occur, and how strong will it be?

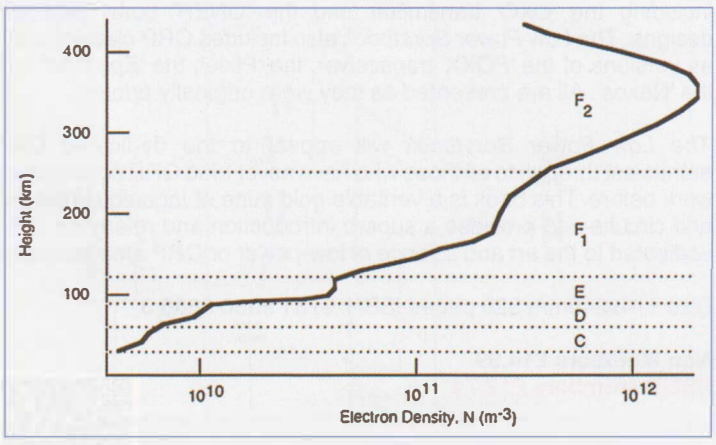

FIGURE 1: The ionosphere has a number of distinct layers, distinguished by their electron densities and heights. The electron density is determined by the amount of solar EUV radiation The F2 layer is the highest of these and provides the longest single-hop skip range.

SEASONAL VARIATIONS – THE WINTER ANOMALY. The angle with which the Sun's rays strike the ionosphere is also a critical part of the ionisation equation. For example, the Sun rises to its highest angles in the sky, and the daily sunshine lasts the longest, during the summer. As a result, the Sun heats the Earth, and its lower atmosphere, the most during local summer. So, one might expect that the Sun would do the same in the ionosphere as well. That is the case – but there is an important catch.

More F-layer ions are created during the local summer than in the local winter. However, 'creation' is only half the story. Solar radiation creates the ions by knocking electrons off originally neutral atoms (mostly oxygen). It is these 'free' electrons that are responsible for skipping signals.

The catch is that the free electrons are eventually lost, by recombining with the same atoms that lost the elections in the first place. As a result, the total number of free electrons that are actually available for propagation is the number created by the Sun, over a given time, minus the number of ions lost at the same time, due through recombination. The longer it takes for free electrons to be reabsorbed, the larger the total number of free electrons found at any given time.

It turns out that, during the summer months, there are other F-layer effects that change the ratio of atoms to molecules. This causes the rate of loss to be much greater in the summer than in the winter. The overall effect is that the wintertime actually has the highest total surviving ionisation, and the best F-layer propagation. This effect is known as the winter anomaly. It is more pronounced in the Earth's northern hemisphere than in the southern hemisphere.

As a result of the winter anomaly, east-west F2 propagation (both path endpoints in the same season) is decidedly better during the winter and rather poor during the summer. However, if one wants to work F2 across the equator, then the best times are the spring or autumn. In this case, neither the north nor south ends of the path have the most ideal conditions, but they each have enough ions to skip on both ends of the path (for instance, see [1]). So, while local summers are always expected to be the worst for F2, the other three seasons have either north-south or east-west possibilities to offer. How good the season will be, then, depends on how active the Sun might be.

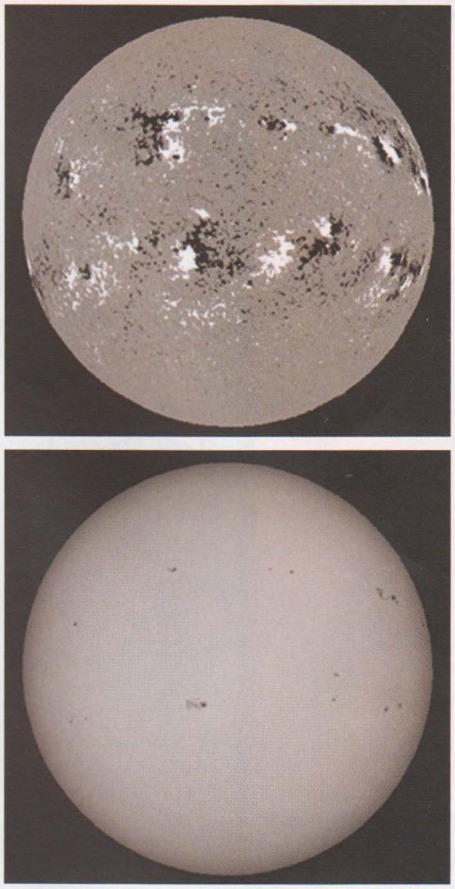

FIGURE 2: The Sun during the Cycle 23 solar maximum. (Top): this magnetogram shows the concentration of strong bipolar magnetic fields in two bands, one north and the other south of the equator. White is pointing out and black pointing in. (Bottom): Sunspots are also found in these same two zones, and rooted in the high field regions. (Images courtesy of NSO/AURA/NSF.)

THE SUN AND SUNSPOTS. The Sun is a star, a hot ball of gas that produces a steady, controlled flow of hydrogen-fusion energy from deep in its core. Virtually all of the fusion occurs from the centre out to about one-third of the distance to the surface. From there, the energy propagates outward in the form of radiation (gamma rays, X-rays and so forth) until it reaches about two-thirds of the distance from the centre. In the last one-third out to the visible surface, ordinary convection is the most efficient mechanism. This gives rise to giant convection updrafts of hot gas, carrying heat energy up to the surface and releasing the energy into space. This cools the gas, which then sinks back into the Sun as a large downdraft, only to be reheated lower down and then to rise again. This upper third is called the convection zone.

The Sun rotates on its axis in about 27 – 28

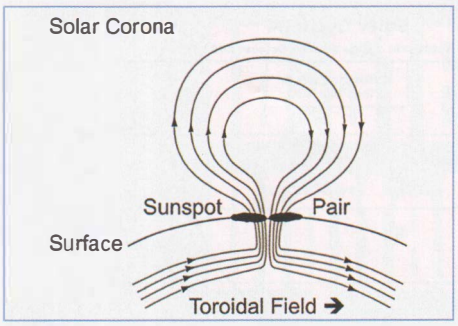

FIGURE 3: Positive and negative field sunspot pairs are formed at the foot points of the toroidal field breaking through the surface and up into the regions above.

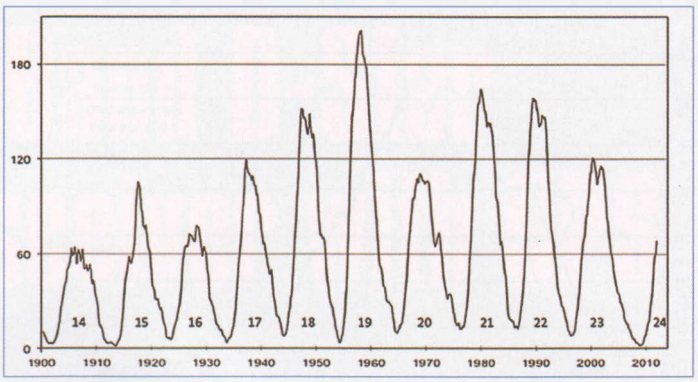

FIGURE 4: The cycles since 1900 show that there is a great deal of variability in the strength, shape and timing from cycle to cycle.

days at the latitudes where the sunspots form. In the convection zone, the material is rotating as if it were a gas, not as a solid object. As a result, the equator is moving rather faster than the poles. This differential rotation leads to rotation rates that run from about 27 days near the equator to about 37 days near the poles.

The beginning of each new solar cycle occurs at solar minimum. At minimum, the overall solar magnetic field looks much like a simple dipole field running through the poles along the rotation axis. This is a rather weak field of about 1 gauss (G). As the cycle progresses and activity increases (sunspots, flares, etc), this 'polar field' gradually decreases in strength. This is because differential rotation causes the weak polar fields throughout the Sun to become compressed into two much smaller ring-like bands parallel to the Sun's equator, one to the north and the other to the south. As this happens, the polar field decreases and magnetic fields in the two parallel bands (the 'toroidal fields') build up much higher local values, up to 6000G.

Figure 2 shows two images of the Sun on 3 April 2000 during the peak of the last solar cycle, Cycle 23. The upper image is a magnetogram, showing concentrations of strong bipolar magnetic fields in the two toroidal bands (white is field pointing out of the Sun and black is pointing inward). The lower image shows that the sunspots are also confined to the same two high-magnetic-field bands, called the 'sunspot latitude zones'.

The strong sunspot-zone fields actually give birth to the sunspots. **Figure 3** shows that when instabilities in the subsurface toroidal magnetic field bands cause a portion of the field to break through the solar surface, a bipolar pair for sunspots is formed in the surface region. Sunspots appear to be dark because they are not as bright as the surrounding surface, because the strong fields in the break-through regions reduce the temperature of the gas at those field foot points.

MEASURING SOLAR ACTIVITY. There are a lot of ways to measure solar activity. The most common measures seen in radio circles are various sunspot indices and the 10.7cm solar radio flux (F10.7). Complicating the situation is the fact that there are two different, but widely available 'sunspot numbers'. One is R_i, the International Sunspot Number (ISN), calculated by the Solar Influences Data Analysis Center (SIDC) in Belgium. The other is the so-called Boulder (or Wolf) sunspot number, calculated by the NOAA Space Environment Center. The ISN index, R_i, is used in this article. The Boulder numbers are typically about 25% higher. It isn't that any one scheme is intrinsically better than the others, but it is important not mix apples and oranges when comparing one number to another.

Another factor is that the daily sunspot values are extremely noisy. As a result, while calculated daily, they are then averaged over a month. However, even monthly 'smoothing' (averaging) leads to very noisy values. As a result, the practice is to then do a twelve-month running average of the monthly values when plotting the values.

Figure 4 plots the smoothed R_i values for all the cycles since 1900 (Cycles 14 – 24). It shows that no two cycles are exactly alike. If the physics of the cycle were better understood, then one could predict future cycles from first principles. Although great strides are being made to understand the underlying physics, there is still much work to be done. There are a number of less sophisticated techniques that are currently used by various researchers. They all rely on the notion that past cycles have an impact on future cycles. There is evidence to support this notion, but just what influences what and how they interact is still not clear.

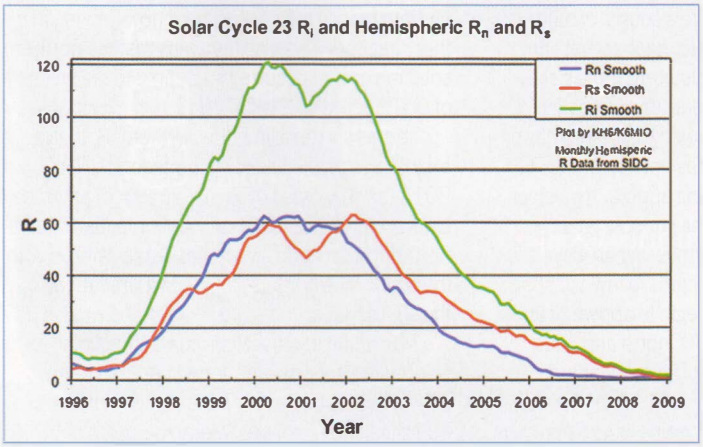

FIGURE 5: The value of R_i is just the simple sum of the Sun's individual northern and southern hemispheric values, R_n and R_s.

CYCLE 23 – THE PHASE SHIFT. The total value of R_i actually includes the sunspots in both the Sun's northern and southern hemispheres. However, an important emerging research area is studying the relationship between the Sun's two hemispheres in a given cycle. The question is: do they each behave the same way at the same time? Generally, the answer is no.

The immediately previous Cycle, 23, which gave birth to the current Cycle 24, is an excellent example of this. It also shows how an earlier cycle can affect a later cycle. **Figure 5** and **Figure 6** show different views of Cycle 23 and the hemispheric values. Figure 5 simply shows the relationship between the two hemispheric values, R_n and R_s, and the total R_i. It shows that the plots of the north and the south have distinct differences and that these influence the size and shape of the total R_i. Figure 6 focuses on some significant details of those north-south differences that had a clear influence on the following cycle, the current Cycle 24.

At the beginning of Cycle 23, both the northern and southern solar hemispheres began to rise essentially at the same time and at about the same rate. However, about two years into the cycle, the southern hemisphere stopped increasing, then actually went down a little and finally, after a delay of about ten months, the south resumed its upward climb. From that point on, the 'south cycle' was persistently phase shifted behind the north by ten to twelve months. The cause of this delay is not understood at this time.

BEGINNING OF CYCLE 24. The end of Cycle 23 and the beginning of Cycle 24 is shown in **Figure 7**. Five things stand out. One is that the minimum in the north occurred at the beginning of 2008. The second is that the south did not reach minimum until the beginning of 2009 – now a phase shift of about twelve months. The third point is that, rather than the north beginning a clear rise toward its Cycle 24 maximum, it remained at very low levels for a year or more. The fourth is that, although the south began its rise to maximum more or less 'on time', the north only began clearly rising when the south began to climb. Finally, the fifth point is that the rate of southern increase is only about half that of the north.

The delay in the rise of the R_n toward maximum

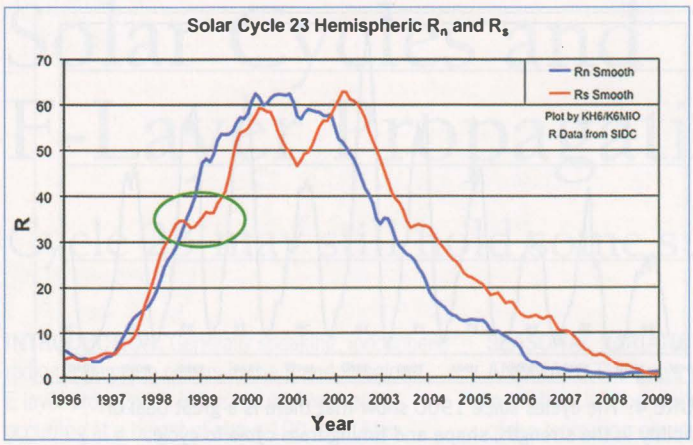

FIGURE 6: Curiously, in Cycle 23 the rising activity from the Sun's southern hemisphere stopped increasing for about ten months (green oval) and then began rising again, causing a 10- to 12-month activity phase shift between the Sun's northern and southern hemispheres.

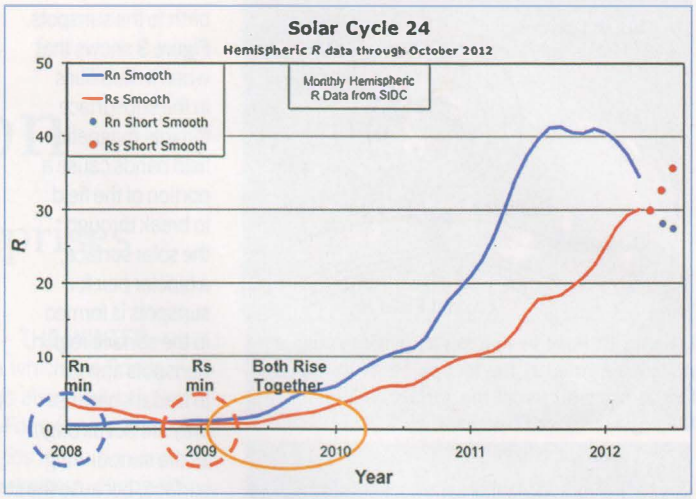

FIGURE 7: As a result of the Cycle 23 phase shift, the Sun's northern and southern hemispheres reached minimum about twelve months apart (blue and red dashed circles). Inexplicably, the northern activity did not begin to rise for more than a year, but started about the same time as the southern activity (orange oval).

and the lower levels of R_s values are difficult to understand. There are at least four possible answers:

- The northern delay represents the north trying to get back in phase with the south;
- The south will reach a maximum of about half that of the north;
- Both the north is re-phasing with the south, and the south maximum will be about half the north; or
- Something else altogether is happening.

What one would like to do is see if any of these several options can be eliminated.

RE-PHASING? There is a way to deal with the question of whether the north was delayed by re-phasing with the south. It relies on a rule of thumb that solar maximum usually occurs about four years after the preceding solar minimum. This isn't an exact number and it does vary from cycle to cycle.

The northern hemisphere clearly reached its solar minimum at the beginning of 2008. If there were no re-phasing occurring, one would expect the northern maximum for Cycle 24 to have occurred around the beginning of 2012, give or take a few months. On the other hand, if the north is re-phasing to match the south, since the southern minimum occurred at the beginning of 2009, then both the Cycle 24 southern and northern hemisphere maxima would occur about the beginning of 2013, give or take a little. So, the key to the re-phasing question is in knowing when the Sun's northern hemisphere maximum occurred or will occur.

Determining the maximum date sounds simple, but it is a bit challenging if you want to get the answer in near real time or, worse yet, in advance. If one goes strictly by the maximum value of R_n, there is an immediate timing issue. First, with the twelve-month smoothing, the most recent R values are from six months ago. Even then, one cannot tell if a maximum has occurred until one has waited long enough after the maximum occurred to be convinced that it isn't going to go even higher later.

Happily, there are a couple of other approaches that can provide a more nearly real-time indication of when maximum has or has not occurred. The first approach involves the sunspot latitude zones. When a cycle first begins, a few sunspots begin to appear at about 30° north and 30° south solar latitude. As the cycle progresses, the sunspot zones slowly march toward the solar equator. By solar maximum, the latitudes of the sunspot zones reach about 15° north and south. By solar minimum, the zones have moved down to about 5° north and south. At that point, the 5° sunspots die out and new cycle sunspots begin to appear back up at 30° north and south again.

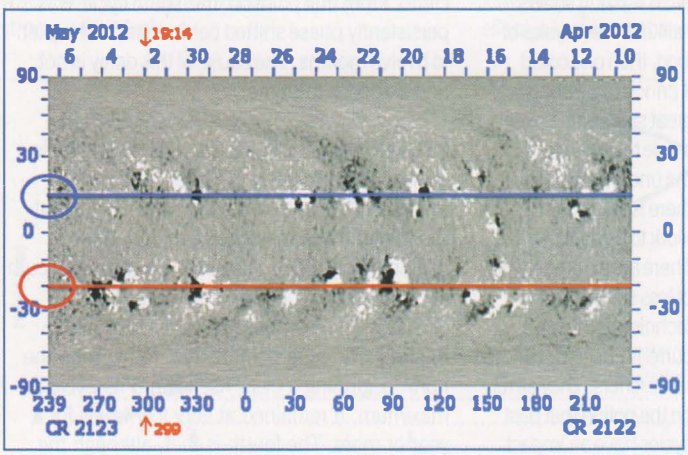

FIGURE 8: This magnetogram shows that the Sun's northern sunspot zone (blue line) fell below 15°N (blue oval) sometime before May 2012, implying that the northern maximum had already occurred. The southern sunspot zone (red line) was still several degrees from reaching 15°S (red oval), so the southern maximum had not occurred yet. (Magnetogram courtesy of NSO/AURA/NSF).

The image in Figure 8 is another form of a magnetogram. It is similar to Figure 2 (upper), but different in that it shows the magnetic structure of the solar surface plotted in terms of solar latitude and longitude for the whole Sun, as seen by the US National Solar Observatory. Figure 8 shows that in early May 2012 the northern sunspot zone was already slightly below 15°N, while the southern sunspot zone was still at about 20°S. This is evidence for the northern maximum had already occurred in the first half of 2012, while the south still had a good way to go.

The second approach involves the Sun's polar magnetic field. It was mentioned earlier that the weak residual polar dipole field of the Sun passes through zero and changes polarity around the time of solar maximum. The plot in Figure 9 shows northern and southern polar field data, gathered and processed by the Stanford University Wilcox Solar Observatory. It shows that the northern polar field (blue) reversed polarity around June 2012. However, the southern polarity (red) was far from reaching zero, although now moving in that direction. This also indicates that the northern solar maximum occurred sometime in the first half of 2012 or the last half of 2011.

This all suggests that the northern, R_n, value might have peaked as early the second half of 2011 (as suggested by Figure 7) and, in any case, before June 2012. This strongly indicates that the northern solar hemisphere has not re-phased with the south. The north is still about a year ahead of the south.

This result seems to eliminate the two re-phasing options mentioned earlier. They still appear to be out of phase by about twelve months. It does not answer the question of whether the southern activity growth is running at half that of the north, or if it will be similar to

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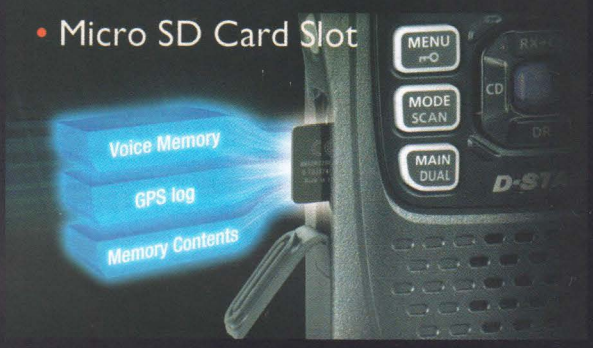

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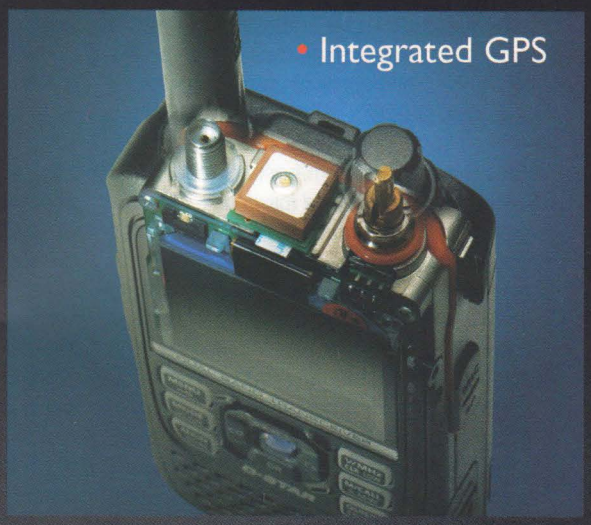

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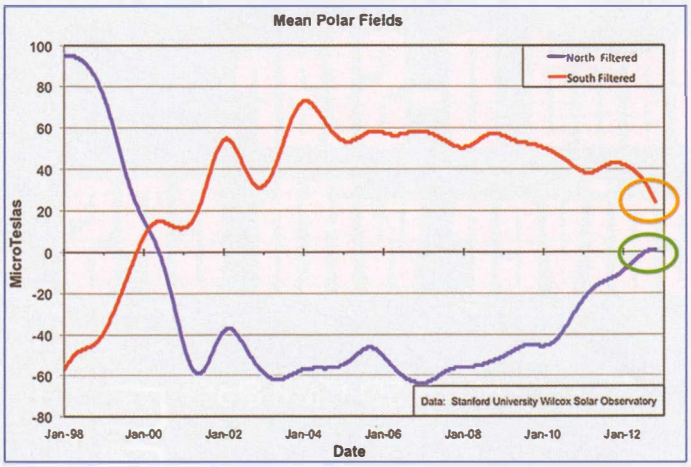

FIGURE 9: The Sun's northern polar field crossed zero and reversed polarity in July 2012, suggesting the northern maximum had occurred or was imminent. However, the southern polar had still not reversed polarity by October 2012, indicating the southern maximum was still in the future. (Polar field data courtesy of the Stanford University Wilcox Solar Observatory.)

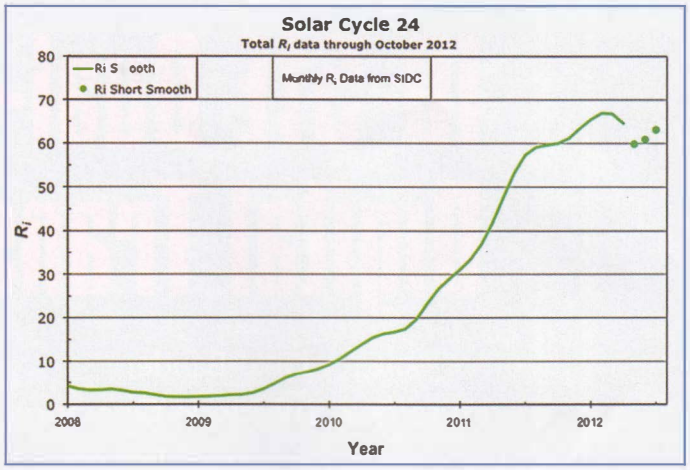

FIGURE 10: The total smoothed sunspot number, R_i, shows that Cycle 24 reached a maximum in early 2012 (solid line). This may not be the actual cycle maximum. The next three 'short-smoothed' points (green dots) show the influence of the rising value of R_s working toward what may be an even higher value in the following several months.

the north, or even if something else even more unusual is afoot.

SOUTH WEAKER THAN THE NORTH? In this regard, looking at hemispheric-cycle data back to 1875, the vast majority of cycles show the northern and southern cycles reaching roughly the same maximum activity value. Moreover, R_s has actually been tracking very close to the trajectory that would put its maximum value very close to the maximum value seen (so far) in the north. So, it is very likely that the southern maximum will have about the same value as the north, but different timing. If so, then the overall solar maximum should occur sometime in early 2013.

CYCLE 24 MAXIMUM VALUE. The total 12-month smoothed R_i up to April 2012 is shown in **Figure 10**. The next three points do not have enough data (yet) for the full 12-month smoothing. They are smoothed over ten, eight, and six months respectively to provide a hint of what the final values might be.

Reliable solar-cycle predictions are still very difficult to do far in advance, given the current state of understanding. As the maximum gets nearer, it becomes easier, if only because activity trends have begun to show themselves. However, the odd behaviour of the current cycle may still have some more surprises.

As noted, it does appear that the north has peaked with a maximum R_n of about 41. However, in Cycle 23, the south had a double maximum, with the second peak coming about two years after the first. If either the northern or the southern solar hemispheres produce a double maximum during this cycle, the overall outcome may be noticeably different.

The maximum total R_i value reached so far occurred in early 2012. However, the three short-smoothed points show a possible further upward trend later in 2012 (due to the climbing R_s). In addition to single hemispheres having double maxima, if the northern R_n does not decline too quickly, the rising southern R_s may take the total R_i even higher, which could lead to a double maximum caused by the north-south phase shift (a rare event).

With those caveats about double maxima, based on the current activity trajectories and historical information, it appears that the northern solar hemisphere reached maximum no later than November 2011, with a value of about 41. It appears that the southern hemisphere may reach a maximum of about 40 around the first quarter of 2013. The overall R_i may reach a maximum of about 70, also around the first quarter of 2013.

IMPACTS ON PROPAGATION. Cycle 24 promises to be one of the lowest solar cycles in the last hundred years. (Some researchers suggest that Cycle 25 may be even worse.) The impact on propagation will depend a lot on the band in question. Below about 10MHz, low solar activity can actually improve daytime propagation (compared to Cycle 23) in cases where D layer absorption is an issue. That is to say, as the cycle peaks, the absorption rises, but not as much as it would have otherwise.

In addition to the normal seasonal patterns discussed earlier, F-layer propagation at frequencies above about 15MHz is negatively impacted by lower solar activity. The lower MUF effects naturally cause problems as the operating frequency goes higher. The most dramatic impacts will be seen above 50M Hz. Generally speaking, fairly regular 50MHz F2 propagation across the equator in the autumn and spring requires R_i values of about 60 and higher. Values in this range have been seen since late 2011 (**Figure 10**); that 50MHz propagation has been happening. Consistent wintertime east-west F2 propagation at 50MHz required R_i values closer to 100. At present, it does not look very good for much of that propagation to occur.

Looking on the upside, certainly conditions over the last four years have improved, as the Sun has emerged from the extraordinary solar minimum and, generally speaking, this has had a positive propagation impact at HF and the low end of VHF. These improved conditions may last through 2013 and perhaps a bit beyond. As a closing remark, it is well to remember that the Sun has a mind of it sown, which may show up again before the cycle is over.

ACKNOWLEDGEMENTS. The author gratefully acknowledges the sources of data used in this article. These include:

- The Solar Influences Data Center's SIDC-team, World Data Center for the Sunspot Index, Royal Observatory of Belgium, Monthly Report on the International Sunspot Number, online catalogue of the sunspot index: http://www.sidc.be/sunspot-data/, 'year(s)-of-data';
- The National Solar Observatory, and the Global Oscillation Network Group (GONG) Program, managed by the National Solar Observatory, which is operated by AURA, Inc. under a cooperative agreement with the National Science Foundation. Some of the data were acquired by instruments operated by the Big Bear Solar Observatory, High Altitude Observatory, Learmonth Solar Observatory, Udaipur Solar Observatory, Instituto de Astrofísica de Canarias, and Cerro Tololo Interamerican Observatory; and
- The Stanford University Wilcox Solar Observatory, which is currently supported by NASA. The data were obtained via the website http://wso. stanford.edu, courtesy of J T Hoeksema.

WEBSEARCH

[1] Kennedy, James, 2000, *50MHz F2 Propagation Mechanisms, Proc 34th Central States VHF Society Conference 2000*, 87-105, ARRL. Available on ZL4AAA's website: www.bobcooper.tv/kh6-k6mio.htm

Antennas

Mobile antenna mounts

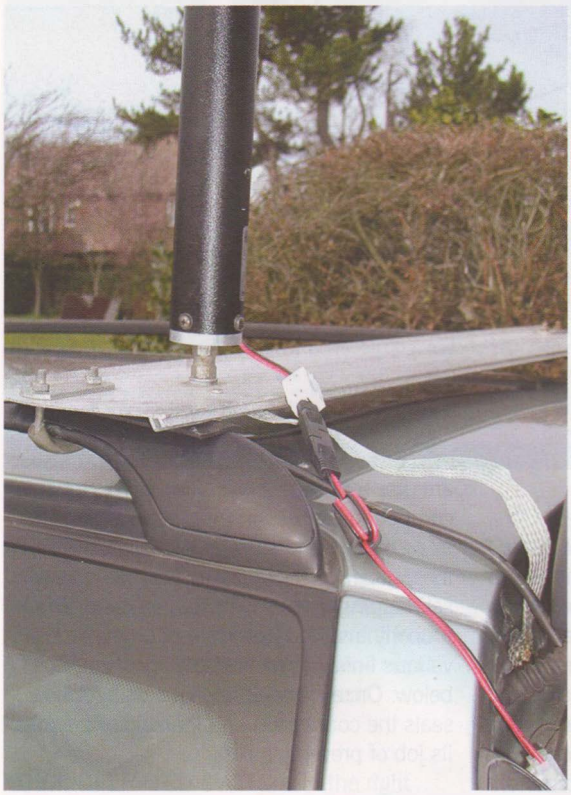

PHOTO 1: A metal plate fixed to a roof rack, which makes a reasonable base for a HF antenna mount. Note the earth braiding strap connected to a point by the tailgate hinge.

WHERE SHOULD IT GO? One of the main problems regarding operating mobile, particularly with a new vehicle, is where to fix the antenna. *EZNEC* models of mobile installations indicate that the optimum location for a mobile antenna is in the centre of the roof of the vehicle, as shown in **Figure 1**.

The model including ground and loading coil losses predicts a maximum gain of -3dBi and a radiation resistance at 14MHz of 20Ω [1]. For this arrangement to be effective the antenna base must be fixed into the metal skin of the roof, which means drilling a hole. A new or fairly new vehicle represents a large investment for most of us; the last thing we want to do is compromise its resale value by making holes in it.

One method of mounting an HF antenna on the roof of a vehicle is to mount it on the roof rack. An example of such an arrangement is shown in **Photo 1**. Here the antenna mount is fixed to a metal plate, which is in turn clamped to the roof rack. Such an installation still requires the antenna base to be earthed to the vehicle body.

THE MAGNETIC MOUNT. If you haven't got a roof rack then one solution is to use a magmount, which is an antenna base fitted to a magnet. This allows the antenna to be fixed to a horizontal flat surface of ferrous metal vehicle body. They have the advantage of simplicity and require no special fixing arrangements, enabling them to be used with a vehicle on a temporary basis if necessary. For VHF antennas the base comprises a single magnet with a SO-239 socket.

For larger HF antennas the surface area contact between the vehicle body and a single magnetic base is insufficient to hold the antenna when travelling at any speed. You could use a much larger diameter magnetic base but this is rather impractical. The solution is to use three or four magnets held together in a frame. This arrangement spreads the load over a much wider area than a single magmount and can be used to support larger HF mobile antennas.

The most common multiple-magnet magmounts use three magnets. An example of one of these is the WMM-340 series made by Watson and shown in **Photo 2**, which can support average size HF mobile antenna (this model has now been superseded by the W300T). It can also support a large antenna if operating from a stationary vehicle. These antenna mounts come with either SO-239 or 3/8in antenna fixing – the 3/8in stud mounting is usually recommended for HF antennas.

I used to be of the opinion that the capacitive reactance between a magmount and the body of the vehicle represented a serious loss. The tests shown in **Figure 2** and **Figure 3** indicates this not to be the case. The capacitance is in series with the vehicle body (counterpoise) and just shifts the resonant frequency, which can be compensated for by altering the antenna length. A coax current choke in the feeder was necessary to get meaningful measurements. The G3WIE choke (using the Fair rite 0431173551, described last January) worked very well.

Just how much extra loss is incurred using a magmout has not been possible to calculate but the Figure 2 and 3 measurements give a clue. In both cases the measured impedance at resonance is 62Ω [2].

MAGMOUNT DISADVANTAGES. Attaching and removing these more powerful magmounts requires care. First, ensure that the surface of the magmount magnets and the vehicle body are free of dust and grit before placement to avoid any scratches to the vehicle paintwork. The trick to attaching such a magmount is to use a lever to lower the mount in a controlled way when fitting it to the vehicle body, as shown in **Photo 2**. The magmount is removed by tilting it up and gently rolling it off in one smooth motion.

The coax feeder is routed either through the door seal (if you are using thin coax) or through a partly opened window (if you are using thicker coax). If you do route the cable through the window it is important that this is so arranged that opening a car door will not result in the magmount being dragged across the vehicle body work, damaging the connection to the magmount or the vehicle paintwork.

In general, magmounts are not suitable for permanent installations. Security could be an issue.

ALTERNATIVE TO THE MAGMOUNT. Phil Godbold, G4UDU, is a keen mobile/portable operator and likes to get on the HF bands radio whenever possible when he is away from home.

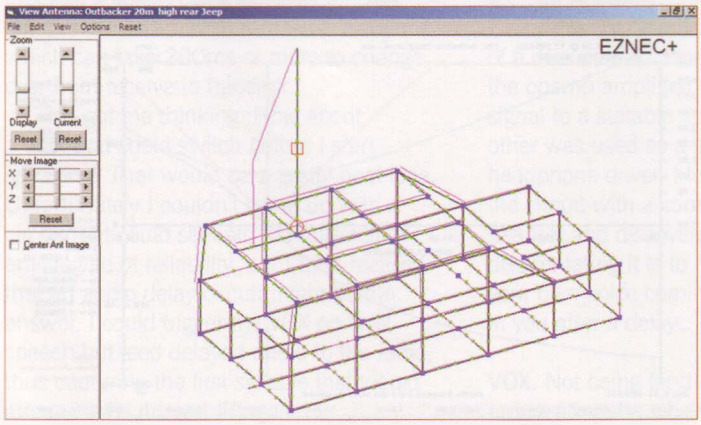

FIGURE 1: *EZNEC* model of a vehicle with a loaded HF antenna fixed to the roof. The small square in the vertical antenna represents the loading coil and the circle, the feedpoint. The red lines indicate the current distribution.

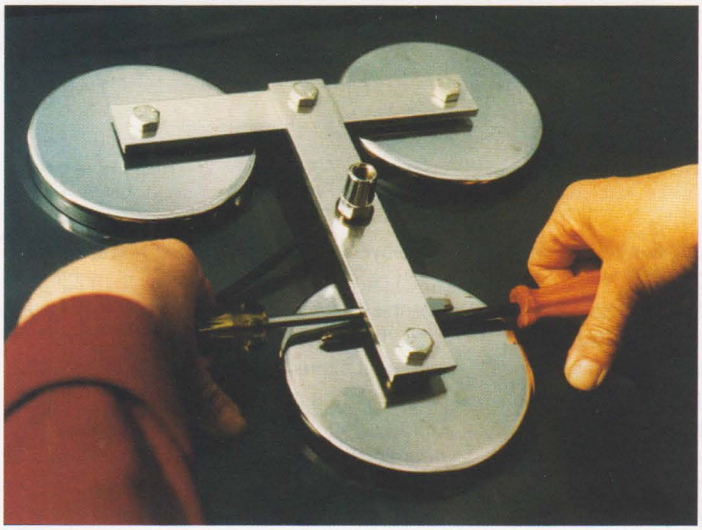

PHOTO 2: A triple magnet mount, comprising three 127mm diameter magnets held together in a frame. These magnets are very powerful and the magmount is being lowered with the aid of two screwdrivers.

PHOTO 3: The G4UDU suction cup antenna mount. The copper braid earth strap was essential.

He often operates from a mobile home, which has an aluminium outer shell. Now this does present a minor problem, in that magmounts tend to be rather ineffective, so an alternative solution was required that didn't require drilling holes to install the antenna mounting.

Writing in *Ragchew*, the newsletter of the Worthing and District Amateur Radio Club, G4UDU said, "I thought about those handles used for carrying sheets of glass or large tiles. These devices have rubber suction cups operated using levers to get a very secure vacuum grip".

These double suction cups are very modestly priced; mine came from a local hardware store for a mere £8.99.

"An antenna 3/8in antenna fixing mount, designed to clamp around a luggage rack, was fixed to the handle of the suction cup tool. The addition of feeder cable and a short section of copper braid terminated with a croc clip completed the project. The clip attaches to a thicker braid connected to the aluminium vehicle body, which acts as a counterpoise." The complete antenna mount is shown in **Photo 3**.

Details of some of these suction tools, gleaned from the internet, are given in [3].

EARTH CONNECTION. Some of the antenna mounts described require that the antenna base be earthed to the vehicle metal body. The favourite material for this job is braided wire, which should be flat and wide. RF flows at the surface rather than through the wire and flat braid has more surface area for any given current carrying capacity. Thus it provides less resistance to RF than an equivalent round wire. Flat braid is also much more flexible and less likely to fail due to repeated flexing.

The braiding from RG8 or RG213 is suitable for relatively short lengths. Just take care when you strip off the outer jacket that you don't cut through the shield itself.

Connections to the vehicle body might be difficult to find. The method I used was to scrape away the paint just under the tailgate hinge. The antenna ground strap is then fixed to the vehicle with a self-tapping screw and a washer, protected against corrosion with a thin film of grease.

This may not be the best way. The reason is that bodies and frames of modern vehicles are dipped in a zinc compound. This zinc compound oxidises in the presence the oxygen in air and seals any scratches in its surface. So a better way may be to use self-tapping screws with star washers. When properly installed, they bite through the various finish layers and into the base metal below. Once exposed, the zinc compound seals the connection and the zinc oxide does its job of preventing rust.

REFERENCES

[1] The radiation resistance was calculated by setting all resistances such as antenna material and load resistances to zero and by using a perfect earth.

[2] The measurements were performed using a calibrated length of feeder so the impedance measurements in Figures 2 and 3 are the values measured at the feedpoint.

[3] **Draper 71172 Twin suction-cup Lifter.** Manufactured from tough plastic with rubber suction cups of 118mm diameter. Maximum lift 40kg; safe working load 20kg. Typically £10-£12. **Draper Triple-suction cup.** Natural rubber suction cups. Max load 60kg, safe working load 30kg. Around £23.49. **B & Q Double suction lifter,** around £9.98. As used with the G4UDU antenna in Photo 3.

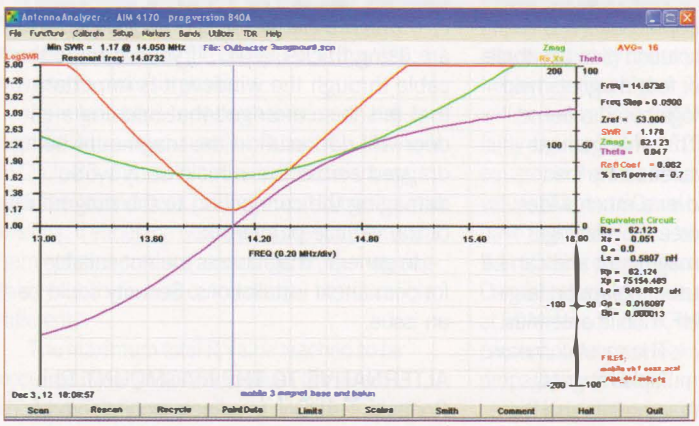

FIGURE 2: Impedance and SWR measurements using the AIM 4170 of an Outbacker antenna mounted on a three-magnet magmount and using an earthing strap.

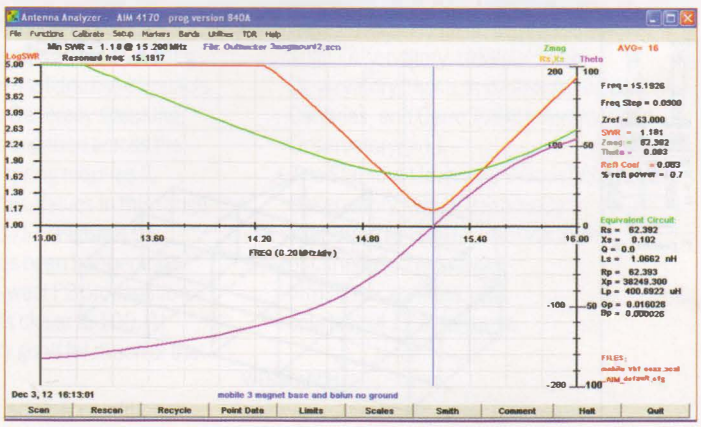

FIGURE 3: Same measurement as for Figure 2 but with the earth strap removed. Note that the feed impedance is relatively unchanged but note the increase in resonant frequency.

The 'Perfect' VOX?

An experimental voice operated switch that never misses the first syllable

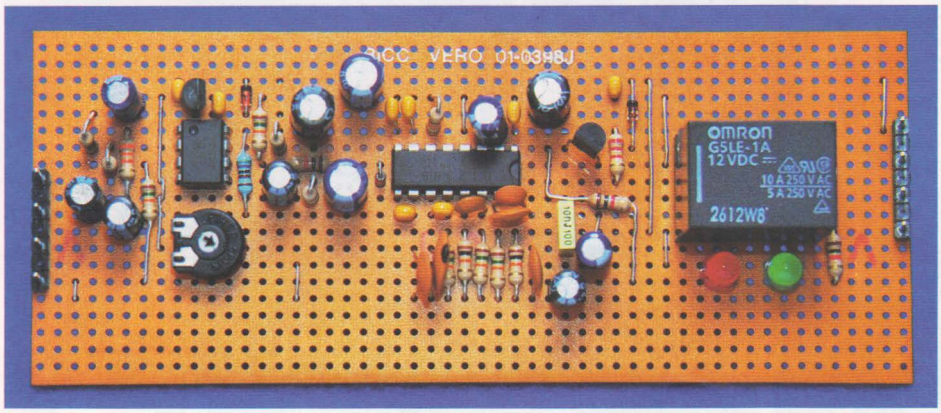

PHOTO 1: Development version of the 'Perfect' VOX.

INTRODUCTION. This isn't intended to be a finished, ready-to-run project that's suitable for every occasion. It's more of a designer's notebook piece that shows how I went from a fanciful idea to working prototype – albeit one that would probably benefit from further development.

VOICE OPERATED SWITCH. In the right circumstances, I like VOX operation. There's something nice about sitting back and letting the radio take care of the tiresome task of pressing the PTT whenever I speak. But therein lies the problem – how does the radio *know* when to transmit? The classic voice operated switch (VOX) constantly listens to the audio from the mic, triggering the transmitter when it detects a sound that's above a threshold (ie, you're speaking). Unfortunately, it takes a finite time for the VOX circuit to make this decision, so the radio typically misses the first syllable or so of every utterance. This is also a particular problem if you're using a more complex setup that has a transmit-receive sequencer, which can take 200ms or more to change over from receive to transmit.

This got me thinking. How about a VOX that could switch *before* I start speaking? That would be a pretty neat idea. Unfortunately I couldn't come up with a circuit that could see into the future with any degree of reliability, but I then realised that an audio delay circuit might be the answer. I could trigger the VOX on 'live' speech but feed delayed audio to the radio, thus capturing the first syllable that would otherwise be missed. Bingo!

AUDIO DELAY. The next part of the problem was to work out how to delay the audio signal. Years ago I would have used a bucket brigade delay line [1] but nowadays all-digital technology is the way to go. I started looking at analogue to digital converters (ADC), memories and digital to analogue converters (DAC), struggling to find anything suitable that wasn't a microscopic surface mount device available only in reels of ten thousand. Then, by happy coincidence, Roy, G8CKN mentioned in passing the PT2399 audio delay chip in his November 2012 ATV column. This wonderful device contains an ADC, 44 kilobits of memory and a DAC plus all the necessary control logic and several opamps in a nice compact 16 pin DIL package. According to the datasheet [2] a single resistor sets the delay time, which can be as long as about a third of a second. A quick search on eBay found a source for the chip in the Far East and a breadboard delay circuit was soon working nicely. The test circuit was essentially the one in the PT2399 datasheet with the addition of a dual opamp. One half of the opamp amplified the mic signal to a suitable level; the other was used as a simple headphone driver. I tested the circuit with a computer headset and discovered how disorientating it is to hear your own voice coming back at you after a delay...

VOX. Not being fond of re-inventing the wheel, I next looked around for a VOX circuit that I could use. I didn't really want to hack into my transceiver – I was trying to come up with a circuit that could be used with any radio.

After finding and rejecting several circuits of varying complexity, I stumbled upon the venerable Motorola MC2830 voice activated switch IC. This 8 pin DIL device combines the functions of an automatic gain control (remember the VOGAD ICs of yesteryear?) with a rather clever VOX circuit that is capable of distinguishing the pulsations of a voice from even quite a high level of background noise. Again sourcing from the Far East via eBay, I used the circuit from the datasheet [3], tweaked a few values and produced a VOX circuit that seems to work quite well. I lashed up the circuits on prototyping plugblock, which proved that the circuit isn't particularly layout-critical.

CIRCUIT DESCRIPTION. My final development circuit is shown in Figure 1. This is intended to be used with an electret microphone. I used a cheap computer headset; I think VOX operation is probably better suited to this than a desk mic. RV1 sets the mic sensitivity; I found mid-range was about right.

The VOX 'hang time' is set by C7 and, to a lesser extent, the characteristics of the relay you use. Hang time is discussed in more detail later.

R7 sets the voice sensitivity of the VOX. With the value shown, audio peaks of just 3dB above the background noise are

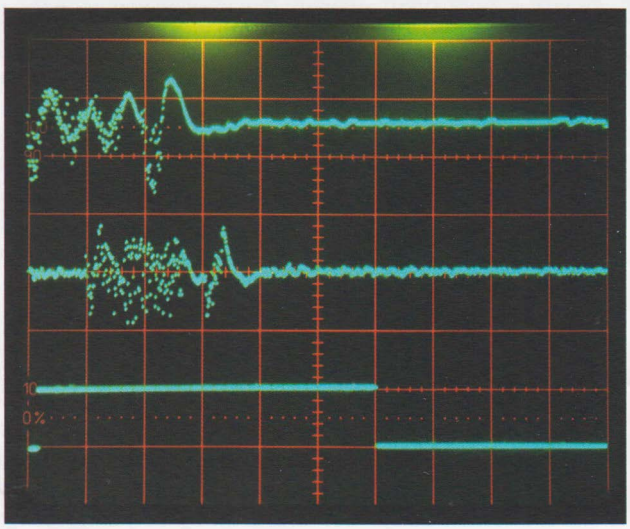

PHOTO 2: Top trace: live "CQ DX" from microphone. Middle trace: delayed audio to radio. Lower trace: PTT line. Note how the delayed audio starts after the PTT goes active. Timebase = 0.5s/div.

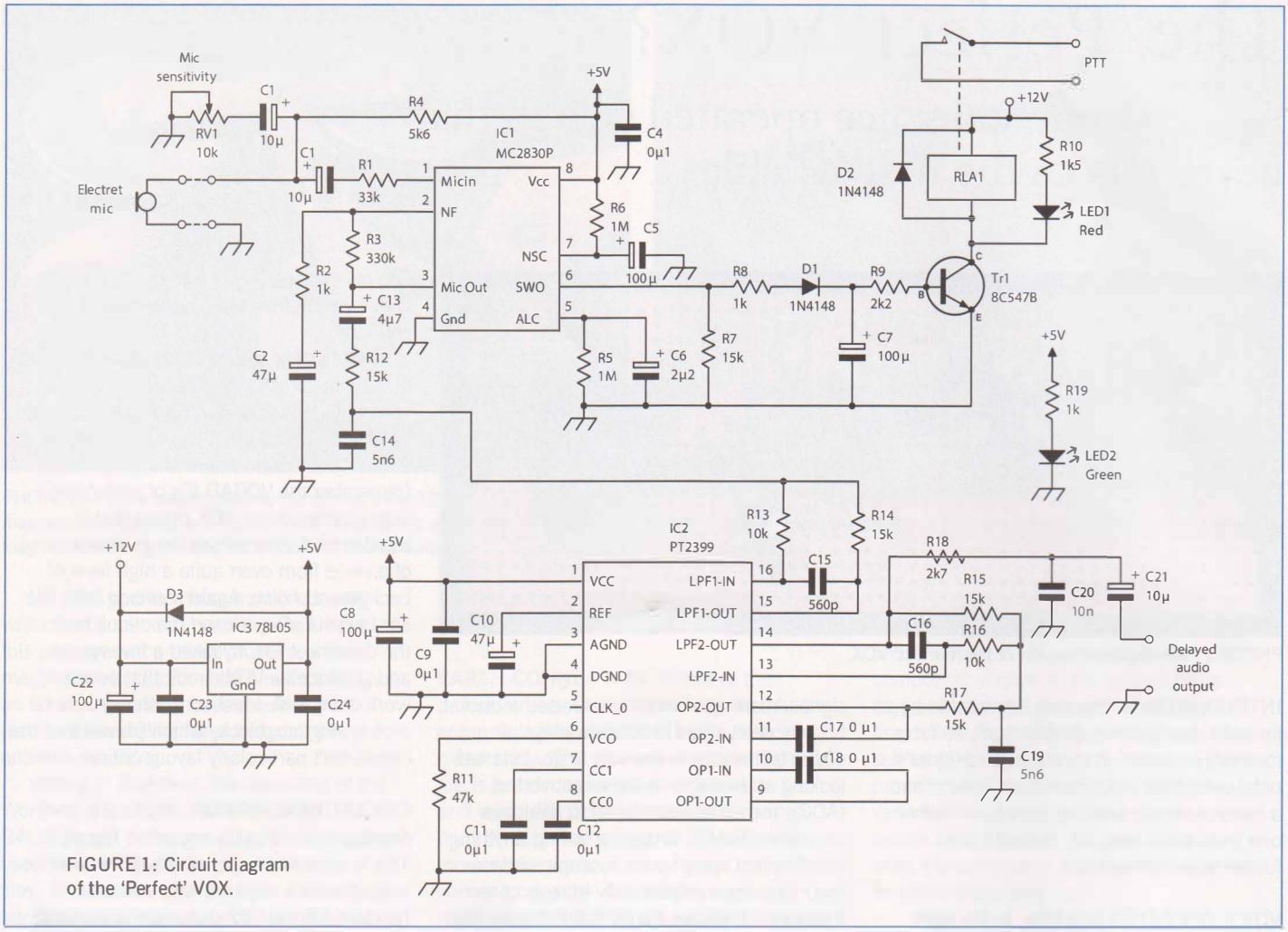

FIGURE 1: Circuit diagram of the 'Perfect' VOX.

sufficient to trigger the PTT relay. I think slightly lower sensitivity may be useful with boom (headset) mics. Reducing the value of R7 to 7k decreases the VOX sensitivity so that speech needs to be 8dB above the background level before it will trigger. I found that reducing the value to 10k helped in some environments – switching a 27k resistor in parallel with the 15k would achieve this. 15k in parallel with 15k gives 7.5k, close enough to the value specified for 8dB sensitivity. I don't recommend switching *between* different resistors, because this could leave pin 6 momentarily without its path to ground.

As you speak, the red LED indicates how strongly you are keeping the VOX open. The relay will stay latched until the LED is quite dim (you'll probably also hear the relay clicking). I used the normally open contact to trigger the transceiver PTT, but it could just as easily be used to trigger a T-R sequencer. Any small 12V relay will do, provided its coil doesn't require more than the 100mA the BC547B can handle.

R11 sets the frequency of the PT2399's internal clock oscillator and hence the length of the audio delay. According to the datasheet, 27k gives about a third of a second; 15k, 200ms and 6k2, 100ms. 47k worked comfortably for me, giving about half a second's delay, but values greater than 47k lead to significantly increased distortion because the sample rate drops alarmingly. In the unlikely event that you need a longer delay, you can cascade extra PT2399 ICs – they're cheap enough – although you may find that audio quality drops anyway as a result of the multiple ADC-DAC stages.

The values of C7 (hang time) and R11 (delay time) shown here were chosen for FM operation. If you're planning to use a VOX like this mainly on SSB, it would be worth shortening the delays. Try 22µF or 47µF for C7 and about 15k or 22k for R11. If your audio delay is long and your hang time short, you'll cut off the tail end of your transmissions...

The green LED and R19 are optional, but provide confidence that the +5V rail is operating.

The output level was about 300mV pk-pk; this suited my requirement, but a 10k preset pot across the output terminals could be used to adjust this if required.

I built my proof-of-concept version on stripboard (**Photo 1**). Layout doesn't seem particularly critical when using the circuit with low power VHF FM gear but I can't guarantee it would be utterly stable when running high power HF and long mic leads. Cheap computer headsets aren't renowned for their immunity to RF, so I would urge you to consider including additional screening and decoupling (not to mention a metal case) if you choose to follow in my footsteps.

Photo 2 graphically illustrates how the circuit works: the top trace shows "CQ DX" spoken into the microphone; the middle trace shows the delayed audio and the lower trace shows the PTT. Note how the VOX turns the PTT on a short time after the 'live' audio starts but well before the first part of the delayed "CQ" reaches the output, and turns off shortly after "DX". We have a 'perfect' VOX that switches to transmit before you start to speak!

CONCLUSION. I can't believe that I'm the first person to come up with a delayed audio VOX system – someone has probably patented the concept – but I am pleased that I managed to make something that works so well for me. I'll leave it to others to polish this circuit into something that's bombproof enough to withstand Field Day: if you manage it, please get in touch...

WEBSEARCH

[1] http://en.wikipedia.org/wiki/Bucket-brigade_device
[2] www.alldatasheet.com/datasheet-pdf/pdf/35152/PTC/PT2399.html
[3] www.datasheet4u.net/download.php?id=220361

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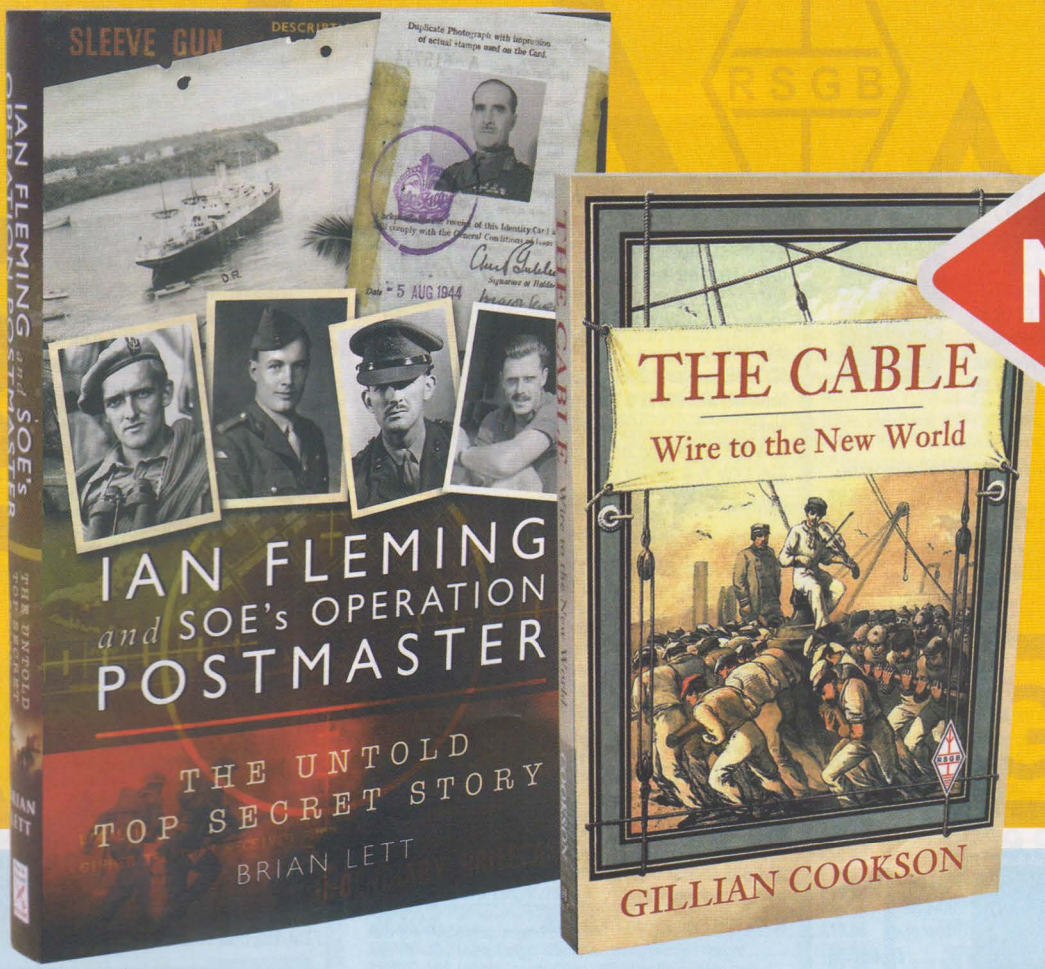

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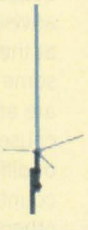

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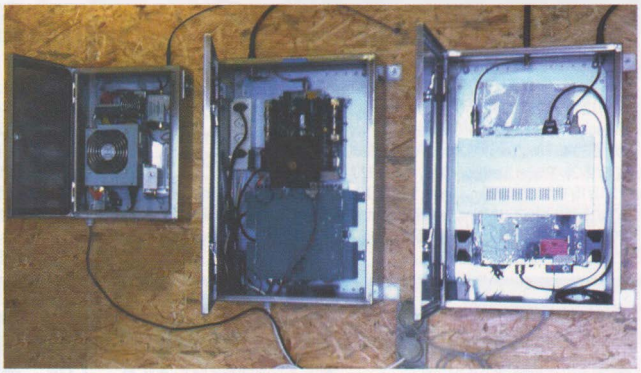
Getting started in... beacons, part 2



The 13, 23 and 3cm beacons of HB9BBD/P. Photo: HB9BBD.

POPULAR. There are currently several hundred beacons in Europe – the global total must run into four figures. They operate in all but a handful of major countries and many small ones. The main holdouts at HF and 50MHz are China and Russia. (Stations with calls that would place them in Russia and sporting a /B suffix are sometimes reported but their status is uncertain.) India, Pakistan and Bangladesh also appear to have no beacons, for unknown reasons.

FREQUENCIES AND COORDINATION. At HF, beacons are expected to operate within band segments agreed between the three regions of the International Amateur Radio Union, IARU. At VHF and above, beacon segments are a matter for the individual regions. The HF band plan assigns 28.190MHz and 28.300MHz to beacons – a relatively generous allocation because propagation is more uncertain than on the other bands and 10m is more likely to be deserted by operators during the years around solar minima. Beacons maintain an amateur presence during those lean years and flag up such openings as do occur. Such is the popularity of beacons that they have overflowed their official allocation and can be found well below 28.170MHz.

The IARU has a coordinator for HF beacons, in each of its three regions, who advise on frequencies. However, a look at the beacon list speedily suggests that if some countries are 'underbeaconed', others are arguably 'overbeaconed' and simply cause clutter. This is partly a consequence of differing national approaches. While some countries have adopted a restrictive line, others allow pretty well anyone who wants to put a beacon on air to do so. Britain takes a midway line: proposals are channelled via the RSGB, which has an eye not only on their technical merit but to achieving a coherent pattern of coverage and avoiding duplication. Ofcom gives final approval, subject on some bands to the views of Primary Users.

On bands below 28MHz, the only frequencies specifically assigned to beacons are 2kHz niches at 24, 21, 18 and 14MHz for the International Beacon Project (IBP). A few beacons have established themselves on those bands nonetheless. Region 1 particularly discourages beacons below 10MHz, reasoning that they are already greatly overcrowded and their propagation characteristics are well-established. The policy is well observed, though with the inevitable occasional exceptions.

In the United States the FCC requires unattended beacons to operate between 28.200MHz and 28.300MHz on 10m and forbids them completely on lower bands, with the sole exception of the three IBP beacons falling within US jurisdiction. At 6m, US beacons again have to squeeze into a very congested 20kHz segment, from 50.060 to 50.080MHz. However, hearing them may become a little easier when (if?) Region 1 beacons migrate to a new segment higher in the band. Other parts of Region 2 operate across the entire bottom 80kHz of 50MHz and the whole beacon segment on 28MHz. A number of South Americans have set up on 7MHz but they are rarely, if ever, reported in Europe.

Returning to Region 1, exceptions to the no-beacon rule can be allowed for propagation projects. The most substantial of these is DK0WCY, on 10.144MHz and 3.579MHz. It is closely associated with the Juliusruh observatory in North Germany. 10MHz transmissions are 24/7 with CW, RTTY and PSK31. 3.5MHz is CW only between 0730 and 0900LMT and 1600 and 1900LMT as an infill for areas 10MHz may not reach at those times. Content, refreshed every ten minutes, includes geomagnetic data and propagation indicators in near-real time. During auroral events, DK0WCY sends a series of 'a's in Morse. In recent years, DRA5 on 5.195MHz follows DK0WCY with a five-minute lag on 5.195MHz. (DRA5 is a commercial call, apparently the German authorities did not want an amateur call on a non-amateur frequency.) Even though so much relating to the radio weather is now on the web, DK0WCY remains a timely source, at times carrying fresh regional information more relevant to our region than 'global' readings. Good Morse practice too!

Other authorised exceptions include low power beacons in Czechoslovakia on 1.8, 3.5 and 7MHz. The OK0EU cluster group exploring ionospheric echoes consists of five beacons 5kHz apart around 3,594.500kHz. They run 1W to delta loops radiating north-south. Another experiment, OK0EPB on 7.039.4kHz, is driven by a pendulum (yes, really!) and transmits 100ms time signals and the current F2 critical frequency with 10W. It was intended for 5MHz and, if the Czech administration relents, it will move there. Meanwhile, it continues the experiment here and it has been copied in the UK, despite all the 40m QRM. Proposals to run projects like these are subject to agreement by the regional beacon coordinator, which must then be endorsed by the next triennial regional conference.

On such matters, beacon coordinators can advise but they cannot enforce. Not surprisingly, in consequence a number of operators run beacons that contravene the band plan. This is mostly an Italian speciality. Fortunately, most run very low power and are rarely reported outside their home areas. (Note, however, that in many countries, stations can work in beacon mode, providing the licensee is present. It is rare, but not unknown, for beacons to run on an 'attended' basis for months and even years. Who knows, perhaps the owner really is housebound.) It is also fairly common to find DXpeditions running a beacon outside the usual frequencies. Such operations are invariably brief and are readily accepted.

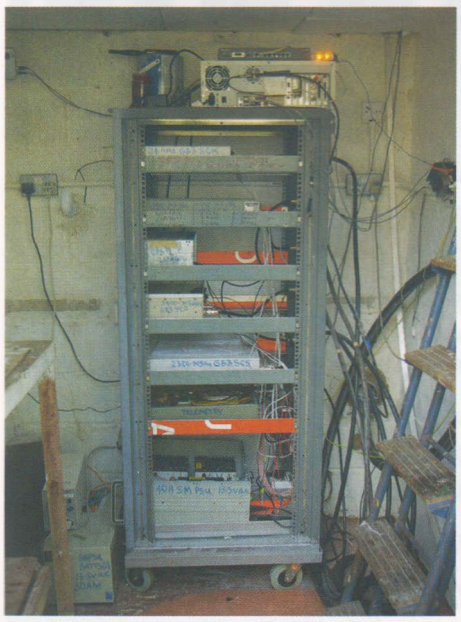
In IARU Region 2 (the Americas), US beacons have to be fitted into a 20kHz segment specified by the FCC, but the rest of Region 2 (North and South America) has much greater flexibility in choosing frequencies. Meanwhile, the multiplication of 50MHz beacons on both sides of the Atlantic has led Region 1 to decide to shift its beacons higher in the band to clear space for CW operators.

WHY? Beacons have always served a variety of purposes. The most frequent is to provide a constant known signal source for equipment alignment – particularly useful when there are no helpful locals to do so. Other beacons have been established to signal that the band is open to their particular area – and since most run 10 watts or less, the fact they can be heard is an indication that the path is well and truly open. (However, the absence of a beacon

should not be taken as proof that a path is closed.) Again, some beacons have been set up to catch specific modes of propagation. A good example is the number of high-latitude beacons on 50MHz, 70MHz and 144MHz in Europe and northern Canada, areas thinly populated by amateurs, which serve to alert operators to auroral events. Further south, beacons such as ZD8VHF, Z21SIX, ZS6DN, and others in Japan, Australia and in the Americas have widened knowledge of trans-equatorial propagation (TEP) over a range of paths and at frequencies up to 432MHz.

Over the last couple of summers an experimental 70MHz beacon, WE9XFT, in Virginia (where there is no amateur allocation) has beamed to Europe with 3kW ERP. Quite soon, GB3WGI should be beaming to North America from Northern Ireland on 144MHz with a similar aim. Such projects, probing the extreme limits of propagation, have to depend on beacons because, unlike humans, they never sleep, break for lunch, take holidays or seek payment – though they are not, of course, cost-free. One should also note the contribution of the DX clusters and the UK Microwave Group's admirable beaconspot page in ensuring the rapid circulation of information.

DIY. Very few of us will ever operate at that sort of level, yet beacons offer ample scope for personal projects involving a single beacon at a particular season or on different bands or by a particular mode, comparing results against predictions and trying to work out why they differ. An excellent example, albeit involving a group, is the 5MHz Experiment investigating NVIS (Near-Vertical Incidence Skywave) propagation, which is readily studied at frequencies of this order. Ten watt beacons were established near Oxford, in Cumbria and on Orkney, making one-minute CW transmissions, in sequence, four times an hour. A group of listeners submitted signal reports over a substantial period, giving rise to several papers discussing the results. There can be little doubt this had a part in amateurs in Britain – and a substantial number of other countries – gaining access to 5MHz frequencies. Similarly, beacons on 50 and 70MHz paved the way for amateurs in a number of countries to be allowed on to those bands.



The side view of the equipment rack. Photo courtesy of the South Coast Repeater and Beacon Group.

WSPR. No survey of beacons would be complete without some reference to the Weak Signal Propagation Report Network (WSPR, or 'Whisper'). This form of (usually) attended beaconing has spread rapidly in recent years and can be found on most bands within narrow modes segments, using milliwatts of power and very narrow-shift frequency shift keying (FSK). Transmissions are digitally decoded with JT65 or similar software that can handle extremely weak, sub-audible signals. The transmission may either be reported on the appropriate web page or may generate a reply and an exchange of basic information. This makes WSJT a rather different animal from traditional beacons, though recognisably a member of the same family yet sufficiently distinct and complex to warrant treatment in its own right. Incidentally, in a similar vein, IY4M, a regular visitor to the UK on 21 and 28MHz, that runs modestly higher power, operates partly as a conventional beacon but also will give a report if called by a set procedure.

PROPAGATION. While some people make the operating, monitoring and reporting of beacons their major interest, most probably use them more occasionally as a means of assessing conditions when they switch on the rig, possibly posting 'spots' to alert other operators to promising developments. Either way, the beacons are there as an ever-present aid to operating, helping to shape our understanding of propagation, whatever the frequency range.

THE PEOPLE. We would be wrong to look on beacons as simply pieces of kit that we turn to or not according to our interests. Behind every beacon is an individual or group. Few beacons are acquired off the shelf. Almost all have had to be built from scratch, sometimes adding up to a major project, or they are modified from earlier commercial or amateur use. Antennas have to be bought or built and the whole setup maintained, often over many years. The power bills can also mount up over time. In all, a beacon can represent a significant commitment in terms of time and money, deserving of recognition.

Some of the hardware on site at the Bell Hill beacon complex. Photo courtesy of the South Coast Repeater and Beacon Group.

THE FUTURE. Today, we have record numbers of beacons, many of them responding to and incorporating technical change. But more can always be done. At HF and the lower reaches of VHF, coverage of parts of Africa and Asia remains patchy. Europe and North America could use their overcrowded beacon segment more efficiently through synchronised frequency-sharing clusters. At 50MHz a synchronised cluster is proposed but has yet to be fleshed out, let alone built. Do all beacons need to operate 24/7/365, as the great majority do now? Many beacon keepers are staunchly committed to low power – and bravo to those who have switched to solar power. Yet there is also a case for more QRO beacons along the lines of DL0IGI, with stepped output: too many very weak beacon signals can give an unduly pessimistic impression of conditions. Finally, how best to encourage further innovation, particularly in those areas of beaconry where it lags? Others would doubtless raise a different questions but the point is that there are unquestionably ways in which the beacon system can give even better service than it has over the past half century or so. No less important is to draw more people into understanding and exploiting what it offers more intensively.

WEBSEARCH

IBP: www.ncdxf.org/beacon/earlyhistory.html
IBP Beacon network: www.ncdxf.org/beacon/intro.html
RSGB Propagation Studies Committee: www.rsgb.org.uk/psc/
UK Beacons from 6m to76MHz: http://beaconspot.eu OK0EU: http://ok0eu.cz
5MHz Experiment: www.g3src.org.uk/downloads/5MHz%20Experiment.pdf
DK0WCY: www.dk0wcy.de/schedule_en.html
OK0EPB: http://ok0epb.nagano.cz

Start Here

A very useful tuneable bandpass filter for MF listeners, including the new band at 472kHz

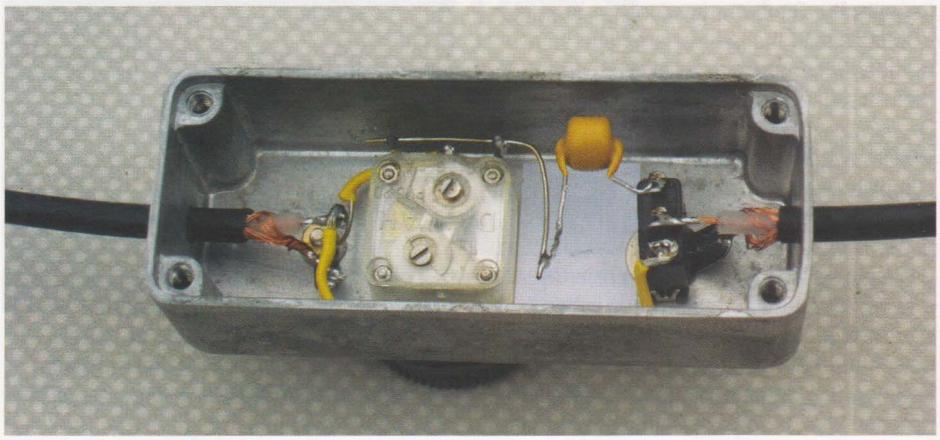


PHOTO 1: Photo of simple tuneable bandpass filter.

INTRODUCTION. This filter was originally built primarily to improve reception of the (then) Special Permit band of 501 to 504kHz, although it has since proved useful on the new 472 – 479kHz band and when receiving aeronautical beacons from 255 to above 500kHz.

THE PROBLEM. Most general coverage receivers have adequate gain at most frequencies; you can hear the background atmospheric noise from the receiver's bottom frequency limit of around 30 to 100kHz up to their maximum frequency of 30MHz. The exception is the medium wave range of around 500kHz to 1.620MHz. The reason that most receivers are so poor at these frequencies is that they automatically switch in a fierce attenuator when the medium wave band is selected. They do this because most medium wave broadcast stations are about 40dB stronger than all other stations and most receivers can't handle such huge signals without causing intermodulation products that would otherwise spill over into the adjacent bands. My general coverage receiver is the TS-850 transceiver, but it is typical of its type. I could hear the background atmospheric noise at 499.99kHz but it completely disappeared when going up another 10Hz or into the 501 to 504kHz band.

A SOLUTION. The first stage was to locate and bypass the automatically switched attenuator, but that is another story. Having done this, the atmospheric noise was clearly audible but so were all the medium wave stations' intermodulation products. What I then needed was a filter that passed the frequencies of interest (eg 472 – 479kHz) with not too much attenuation, but severely attenuated (by at least 40dB) all the medium wave stations. I decided that a simple series resonant circuit, consisting of a single inductor and a variable capacitor, would be adequate. The 'trick', so to speak, would be to obtain sufficiently high out of pass band attenuation, while keeping the pass band attenuation reasonably low – and this would require some optimisation. I decided that the inductance would need to be high and the capacitance low. As the filter would be placed in the 50Ω coax feeding the aerial, I reckoned that inductive and capacitive reactances of about 100 times 50Ω would be required. (This does not imply a Q of 100. The 50Ω at each end of the filter are effectively in series and also there is bound to be some loss in the inductor. In any case, the receiver input impedance and certainly the aerial impedance are probably not 50Ω.)

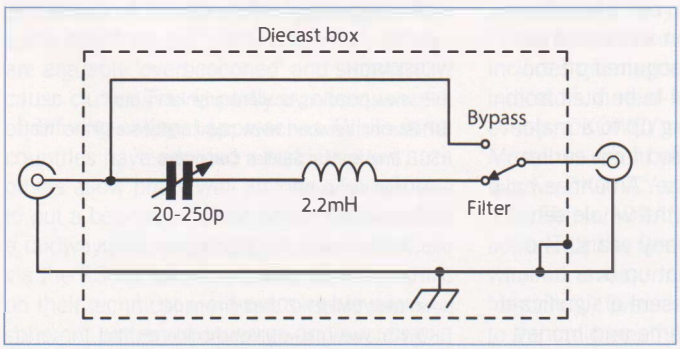


FIGURE 1: Circuit diagram of the tuneable MF bandpass filter.

The design eventually used was an inductance of 2.2mH in series with a 20 to 250pF variable capacitor salvaged from an old transistor radio, the pair being capable of being bypassed by a small switch to give a 'through' position. All were enclosed in a diecast box with flying leads terminated in a PL259/SO239 plug and socket. The complete unit is shown in **Photo 1**.

Figure 1 shows the circuit diagram of the tuneable bandpass filter. It's important to connect the braids of the coax cables to the diecast box. I used a machine screw and solder tag at one end; on the other, I used a larger solder tag that fitted over the switch shaft.

PERFORMANCE. As it was designed as an in line unit for 50Ω coaxial aerial feeder, it was first placed between a 50Ω pad from a signal generator and a 50Ω 'through load' to an oscilloscope. Its throughput was measured with changing frequency. The 3dB bandwidth was 11kHz and the loss was 7dB at 502kHz, roughly what was expected. However, when placed between the TS-850 and 60 yards of RG213 coax ending in a 50 yard aerial wire (the way it was intended to be used), its loss was only 3dB, which was even more satisfactory. Also, the sharp increase in atmospheric noise as the unit was tuned through the receiver frequency was very marked, which made it easy to tune.

When the unit was used directly between the transceiver and a 50 yard wire aerial with no coax between them, it acted as an ATU, tuning out the reactive part of the aerial. Signals and noise were some 15dB greater than when using the coax fed aerial wire. Suppression of strong medium wave broadcast stations above 909kHz (Radio 5) was at least 60dB, with no trace of intermodulation products with the filter switched in. I think this is a very useful piece of kit that is simple to construct, works as expected and is ideal for the MF station logger.

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Design Notes

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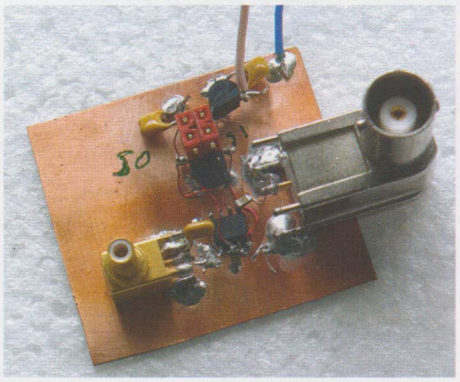

PHOTO 1: ICS501 PLL frequency multiplier breadboard.

MULTIPLIER. The ICS501 is a phase locked loop (PLL) frequency multiplier device that can accept any input frequency within a range of 2 to 50MHz and multiply it by one of several selectable multiplication factors – not necessarily all integers – to a maximum frequency of 160MHz. **Figure 1** shows how the chip is connected for the different factors when using its internal crystal oscillator. For an external source, connect this via a DC blocking capacitor to pin 1 as shown by the dotted line. It can run from a power supply in the range 3 to 5V and consumes typically 20mA with a 5V supply. The multiplication factor needs to be selected by linking two pins S1 and S0 to either ground, +V or leaving them open circuit, as shown in **Table 1**. This somewhat unusual three-state pin selection allows nine different multiplications to be selected, as shown in the table. Be aware, though, that not all multiplications are possible over the entire range of input and output frequencies. You do need to maintain the 13 to 160MHz maximum output frequency together with the input frequency limitations, but operation is usually possible slightly outside these specified limits.

To be able operate over such a wide range of frequencies as this chip achieves, integrated PLL multipliers usually have to compromise in some areas of circuit design. Here, the overall phase noise performance has been sacrificed to a degree in order to make the PLL bandwidth as wide as possible and allow an internal oscillator that can be tuned over the 13 to 160MHz output range.

Photo 1 shows a breadboard made using live-bug construction. A typical output spectrum, multiplying an 18MHz externally generated source by 8 to deliver 144MHz, is shown in **Figure 2**. The plot was generated by feeding the signal, suitably attenuated, into a 144 to 28MHz converter followed by an SDR-IQ receiver to display the output spectrum. The resolution bandwidth for the plot is 6Hz and it can be seen that the worst case phase noise appears at a distance of about 25kHz away from the carrier, at a level of 75dB below the carrier amplitude. Phase noise always is specified at various offsets in units of dBc/Hz so in the 6Hz resolution here, this measured worst case phase noise is therefore equivalent to -75 - 10.log(6Hz/1Hz) = -83dBc/Hz.

This is not a particularly good phase noise performance at all when compared with that obtainable from a traditional crystal oscillator / multiplier where values of lower than -120dBc/Hz should be easily achieved, or even with when compared with a modern synthesiser / divider combination. However, for a quick 'cheap and cheerful' solution for tasks such as a low power portable transmitters or a signal source, the extreme simplicity of this chip may make it a particularly worthwhile contender. It certainly removes the complication of tuning up several multiplier stages and checking that no subharmonic radiation is present. The ICS510 is available from RS [1] (although only in packs of two) for around £2.15 per device.

A more comprehensive set of phase noise measurements made over several different input and output frequencies can be found at [2].

The ICS307 chip has a broadly similar performance, but requires a separate microcontroller to program it using a three wire serial interface. It has a wider range of multiplication values. The ICS307 is also available from RS for around £5.65 each. The datasheets for both can be downloaded free of charge from the RS website.

PHASE NOISE IN PERSPECTIVE. While on the subject of phase noise, it is worth considering what a level of -83dBc/Hz actually means – and sounds like – in practice. Assume an SSB receiver with a 2.5kHz IF bandwidth tuned to a frequency 25kHz away from that carrier (where we measured the dBc/Hz value). We calculate the received noise relative level as follows. The actual noise in our 2.5kHz bandwidth will be -83dBc/Hz + 10.log(2500) = -49dBc. So the total noise getting through the SSB filter will appear at a level 49dB below what it would if the receiver were retuned onto the actual carrier. Using the oft-quoted (and rarely accurate) rule of 6dB per S-point, if the main carrier were an S9 signal, the noise 25kHz away would be around S1; just noticeable. Perhaps more significantly, if the carrier were a strong S9+20dB signal, the noise would be a very audible S5.

VHF BEACON DRIVER SOURCE. As part of a new high power 144MHz beacon carrying the JT65 data mode amongst other modulation types, I needed to make a synthesiser-based driver. The specification called for a power output from the driver of up to 300mW so that it could be used with standard solid state power amplifier (SSPA) modules. For simplicity (and because all the datamode generating software already existed), I elected to use the LMX2470 fractional-N synthesiser, which has been mentioned in this column previously. However, that chip can only work over the range 500MHz to 2.8GHz, so the search was on for a suitable and modern frequency divider to drop a source at few GHz down to 144MHz.

The search proved surprisingly difficult. Once upon a time, when synthesiser chips only ran at HF or VHF, dividers for taking microwave frequencies down to the range the chips could run at were very common. Now the synths themselves run at many GHz, those prescalers are no longer needed.

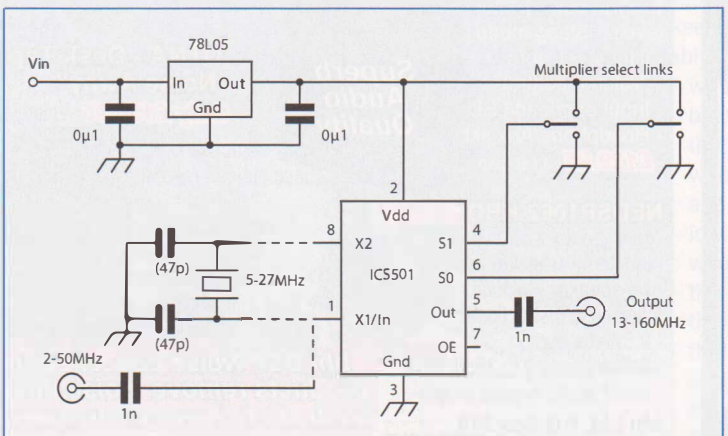

FIGURE 1: Connections to the ICS501 integrated frequency multiplier chip.

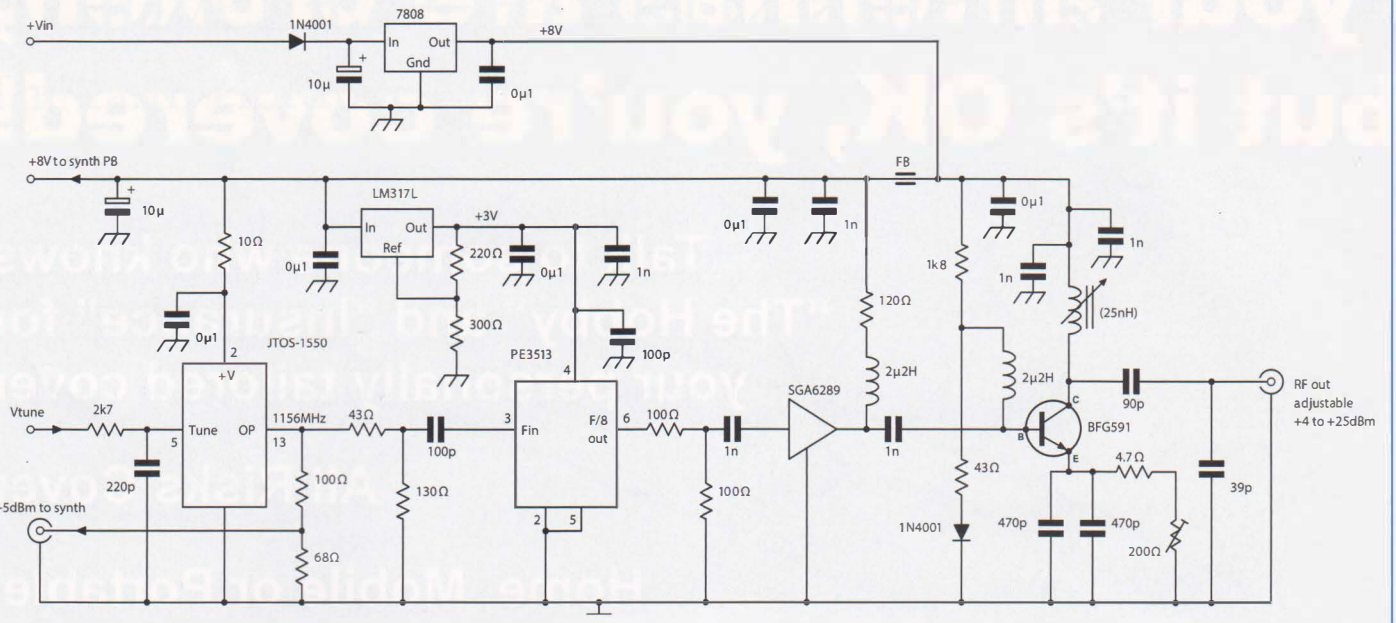

FIGURE 3: Circuit diagram of the 144MHz beacon driver.

However, a few modern fixed divider chips are still around and the PE3513 from Peregrine Semiconductor [3] was identified as being suitable for the job. This is a divide by eight device, thus allowing the LMX2470 to run at a comfortable 1.15GHz. I used an existing PCB for the synthesiser chip so an additional unit had to be built carrying the VCO at 1.15GHz, the divider and amplifier stage. Figure 3 shows the circuit diagram. A packaged MiniCircuits VCO drives the divider stage directly with an auxiliary output sending a portion of the VCO fundamental to the synthesiser. The output of the divider chip is amplified in two stages. The first is a packaged modamp: an SGA6289 was used because several were to hand, but several other types could be substituted, such as the MiniCircuits PHA-1.

Finding a suitable device for the output was interesting. In days of yore, I would have used the venerable 2N3866 or 2N5109 for 200 – 500mW at VHF. But I wanted to get away from old-fashioned wire ended transistors with their complicated mounting and heatsink requirements and use a modern surface mount device. A search of the Farnell and RS Component catalogues threw up several suitable types, all costing just a few tens of pennies each. The BFG591 looked the most suitable. The data sheet suggested a maximum gain at 144MHz of well in excess of 20dB, so there would be plenty of scope for backing off and adding resistive loading to keep it stable and broadband.

To get 300mW output from a 12V supply means the final amplifier stage really ought to be designed to deliver 0.4W. The collector load therefore needs to be 122 / (2 * 0.4) = 180Ω. This is transformed to the 50Ω output impedance by the two-capacitor tapped network. The residual reactance in parallel with the transformed load resistance is then tuned out by a ferrite-cored inductor. Adjusting the value of this inductor allows it to absorb the reactive components of the transistor and the heatsink pad. The Q of the output network is only about 7, so the matching is not critical and is reasonably broadband. To facilitate backing off the drive level to optimally match the high power PA stages, a preset resistor was included in the emitter. Class AB biassing is used, with a diode in thermal contact with the transistor to keep the bias stable with temperature. Dissipation in the output device at full power output is around 1W. The datasheet for the BGF591 allows 2W maximum with a heatsink at room temperature, so it is operating comfortably within a safety margin.

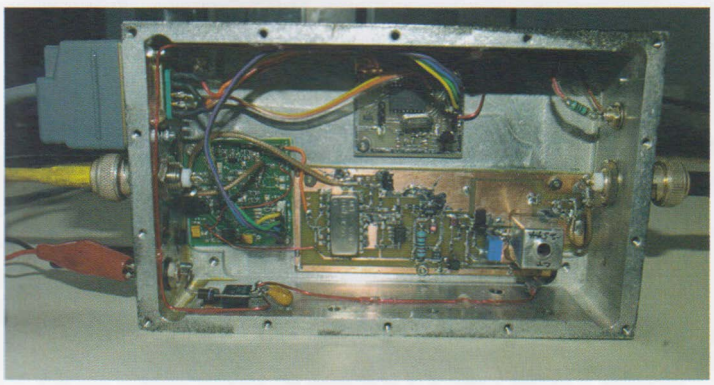

PHOTO 2: The complete 144MHz beacon source. The LMX2470 module appears on the left, with the large PCB containing the VCO, the divider and the amplifier stages. The heatsink pad for the final transistor is under the top left corner of the output inductor screening can. The small PCB at the top is the PIC controller.

One reason for wanting to use an SMT transistor is that heaksinking is made easier by simply soldering its collector to a large area of copper PCB foil, then relying on thermal conduction through the PCB substrate to conduct heat away to the ground plane and chassis underneath. Glass fibre has a thermal conductivity of 0.6W/metre/°C, meaning the temperature rise in °C per watt = 0.6 * thickness / area. Knowing this, we can calculate the size of pad needed to dissipate 1W of heat for a wanted temperature rise. The PCB material selected is 0.8mm thick; the ground plane on the underside will be in contact with a chassis not far above room temperature so, if we accept a temperature rise for the pad of 10 degrees above the groundplane, the area of pad needed = 1W * 0.8mm / (10°C * 0.6) = 130mm², which is a square of less than 12mm on a side.

In practice a larger pad of 250mm² was used, because the board area was available once the inductor screening can was placed. The additional capacitance of this deliberately large collector tab can be calculated using an equation not dissimilar to that of thermal conductivity. Knowing that the relative permittivity, Єr, of glass fibre PCB is 4.5, C = Єo. Єr * area / thickness = 8.85 (pF/m) * 4.5 * 250 (mm²) / 0.8mm = 12.4pF.

CONTINUED ON PAGE 38

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A novel 472-479kHz antenna

The earth-electrode pair

INTRODUCTION. Like many, my home is not blessed with a large garden, so the mega-antennas used by some on the LF and MF bands are just not possible. Instead, small Marconi verticals and wire loop designs have been tried with varying degrees of success.

In the past, I have used earth-electrode pairs for my VLF work, so I thought it was worth trying these on the new 472kHz band to see how such a system would perform. I was not expecting very good results but was amazed how well it worked, both on transmit and receive.

WHAT EXACTLY IS AN EARTH-ELECTRODE PAIR? This consists of a pair of earth rods, in my case about 1m long copper earth stakes, driven into the soil about 20m apart in the garden at the back of the house. An alternative arrangement is one earth rod at the far end of the garden and a connection to a metal water pipe inside the house, which in most cases finds its way electrically to ground as the water supply enters the property [1].

The output of the transceiver or transverter is connected directly to the two earth rods using ordinary PVC covered wire. I used 32 x 0.2mm (1mm^2) wire. The current was measured with an in-line antenna current meter [2]. Depending on the impedance of any a particular earth-electrode pair, some form of matching may be necessary.

The wires are simply laid out across the grass, as shown in Figure 1. It is important that the space between the two electrodes is not bridged by other earthed structures: the best results will be when they are far apart and 'in the clear', far from any other pipes, buried metalwork or cables.

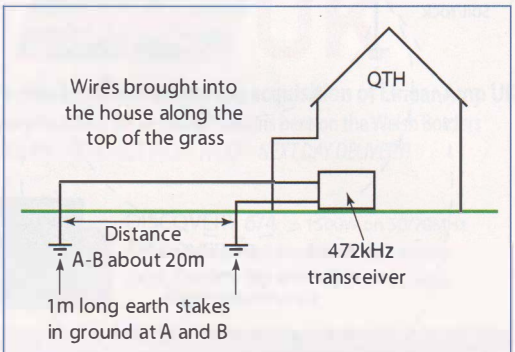

FIGURE 1: The basic earth-electrode 'antenna' setup in my back garden.

COMPARISONS. To test the performance of this earth-electrode pair antenna, it was necessary to do some comparisons with other antennas. I used a small 9m high, top-loaded, Marconi vertical tuned to 472kHz using a fixed inductance near the top of the vertical section and additional inductance in series at the bottom to bring the whole antenna to resonance. I also tried an earth-electrode pair with one wire elevated, forming a 3-sided vertical loop.

To compare the field strength from each antenna I ran a series of WSPR beacon transmissions over a period of many hours with each antenna. I made a record of the received signal to noise ratio logged on the internet WSPR database by reporting stations with each antenna. To avoid any chance of one antenna disturbing the other, only one antenna was erected at a time. The output from my transmitter, an FT-817 with a homemade transverter, was around 10W – although the radiated power is a fraction of this.

RESULTS. Based on several days of observations of my signals by stations up to 701km distant, I established that the earth-electrode antenna is between 2 and 14dB down on the Marconi antenna, with worst results from stations at right angles to the structure. For stations 'in line', the difference in performance was only a few dB. In other words, this antenna is not as good as my Marconi vertical, but it still works pretty well and gets reports from a LONG way away (see **Table 1**). It is equally effective on receive, with good signals received from many stations across Western Europe on WSPR and on CW.

TABLE 1: WSPR spots received when using <10mW EIRP from the earth-electrode antenna.

Reporter	SNR (dB)	RGrid	km	Azimuth
DL-SWL	-28	JO52hp	701	83°
PI4THT	-30	JO32kf	448	88°
PA0A	-25	JO33de	417	73°
PA3ABK	-30	JO21it	306	98°
M0LMH	-30	IO93gx	223	329°
G0KTN	-27	IO81ti	210	242°
G4AGE	-25	IO93if	151	316°
G0MQW	-23	IO91ml	123	225°
M1GEO	-28	JO01cn	79	184°
G3ZJO	-20	IO92ng	79	270°
M0BMU	-30	IO91vr	69	210°
G0BPU	-23	JO02ob	67	110°
G7NKS	-16	IO92ub	46	240°
G8KNN	-11	JO02bf	12	248°
G4HJW	+7	JO02de	9	180

HOW AND WHY DOES IT WORK? Although it is not possible to be certain, I believe the best explanation is that the earth-electrode pair antenna acts as a kind of vertical loop in the ground: current flows from one earth rod (A) into the ground and returns to the other rod (B) via a series of diffuse paths within the soil and rock beneath the structure. How far down and out the signal spreads will depend on soil chemistry and on the geology of the rock beneath. In my case the ground is a light alkaline soil over chalk bedrock that is less than 2m below the surface. Instinctively one would expect the largest loop to be formed in low conductivity rocks and soils as the current has to 'spread out' more. In the limit, if the soil between the two earth rods was a perfect conductor, then all current would return directly from A to B and the loop would have no enclosed area.

Using the signal strength report data that I had logged and knowing the distance to the various listeners, it is possible to work out my effective isotropic radiated power (EIRP). Based on some well proven formulae, Belgian amateur Rik Strobbe, OR7T then calculated the effective size of the loop within the ground that would be needed to produce this EIRP. He calculated that the virtual loop in the ground was as large as 290 square metres, which is very big. Measurement errors mean this could be an order of magnitude out either way, but it has to be quite large to work as well as it does. In my case, the loss resistance of the earth-electrode system works out as being 66Ω (so I am able to directly connect from my rig into the earth-electrode antenna) and the radiation resistance is around 0.017Ω, to achieve the field strengths I do. Only a tiny fraction of the power from the transmitter is radiated, but this is also the case for other small antennas at LF and MF.

For information, the radiation resistance of a small loop Ra = 320*π^4*A^2/λ^4 (ignoring the presence of any ground plane under the antenna) and 2*320*π^4*A^2/λ^4 when this is included. A is the enclosed area of the loop in square metres.

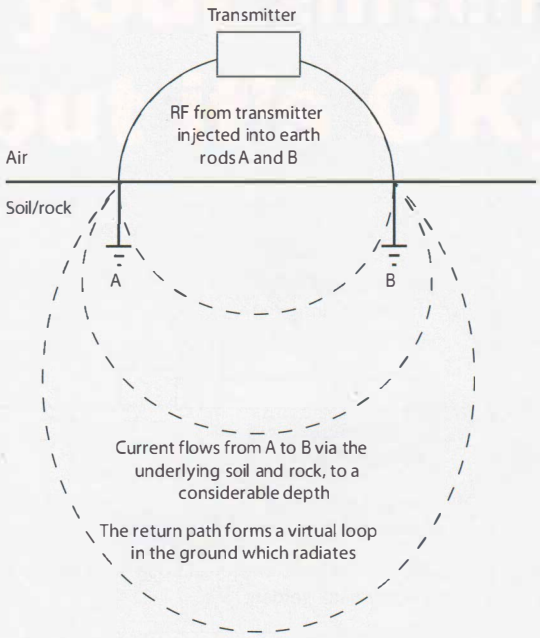

FIGURE 2: How the current flows in the ground to form a virtual vertical loop.

It is possible to improve the performance of this structure by raising the height of the connecting wires, forming part of the loop in the air as well as in the ground. This is indeed how this antenna started out, until someone suggested I try it with the wires laying on the ground in the grass: performance was almost unchanged and it is much easier to string a piece of wire across a lawn than elevate it up in the air. The small difference in performance as a result of elevating the 'above ground' part of the loop adds credence to the 'large loop in the ground' theory.

PRACTICAL USE. Clearly, most people will want to radiate as much power as possible, up to the legal limit of 5W EIRP on the 472 – 479kHz band. However, many are, like me, unable to erect large antennas and are prepared to accept a reduced EIRP, especially if the 'antenna' system becomes ridiculously simple. With the performance of the earth-electrode averaging just 8dB below that of my 9m high Marconi, I am still able to get WSPR reports from a large number of stations across Western Europe. The performance is certainly good enough to use it for semi-local CW QSOs out to at least 50-75km, even though my EIRP is only around 5mW from the 10W transmitter.

(From my earlier work at 136kHz, I know this structure is able to radiate a signal over a considerable distance, even with very low EIRP levels. At 136kHz, if one is prepared to accept the compromises, such an approach is a useful alternative when compared with a very large 'in the air' antenna with large, low loss, loading coils that may need to be in the 4-6mH range.)

CONCLUSIONS. The earth-electrode pair can be a very useful alternative 'antenna' for the new 472 – 479kHz band. Although results will very much depend on local soil, rocks and the degree of metal clutter in the garden, it is certainly an antenna to try when larger antennas are not possible.

REFERENCES

[1] This may not be the case for more modern properties where water is supplied through plastic pipes. A continuity check between the 'far' earth stake and a metal water pipe should indicate up to about 150Ω if the pipe is nicely earthed; the resistance will be rather higher if the pipework is plastic.

[2] A suitable circuit appears *LF Today*, by Mike Dennison, G3XDV and Jim Moritz, M0BMU, ISBN 9781 9050 8636 8, RSGB.

CONTINUED FROM PAGE 35

The shunt reactance from this extra capacitance in parallel with the transistor collector is then absorbed into the tuning inductor. **Photo 2** shows the final PCB.

EVEN SIMPLER RF SOURCE – AND A SURPRISING DISCOVERY. After delivering the driver module to the customer, I decided it was time to revisit the LMX2541 fractional-N synthesiser; the one with an integrated VCO and output divider I'd started to look at over a year ago. That chip would make redundant the external VCO and separate divider. In the November 2012 Design Notes I described how I thought that chip had been destroyed by applying excessive volts to one pin while trying to program it. For a Mark 2 breadboard I redesigned the PCB to avoid the possibility of applying excessive voltage to a programming pin. Fortunately, I'd not thrown away the first module, or even tried to remove the damaged chip. Using this old one as a guide when soldering up the new PCB, I noticed I'd forgotten to install one of the DC chokes. The one feeding the pin for the internal logic circuitry was missing. That the chip, sort-of, originally worked at all, albeit incorrectly, was very surprising. It had to be getting some sort of weak power supply to the internal divider circuitry via leakage round internal pathways. Had it failed to work completely, I might have spotted a missing choke a lot sooner. An incorrectly functioning, but still mostly working device did, at the time, suggest it was broken; not just missing DC on one pin. A lesson for the future there! The happy result was that I now have two fully functional LMX2541 synthesiser modules.

TABLE 1: Multiplication factors and fractions for the ICS501 PLL.

Pin S1	Pin S0	Multiplication	Fraction
0	0	4	4/1
0	Z	5.3125	85/16
0	1	5	5/1
Z	0	6.25	25/4
Z	Z	2	2/1
Z	1	3.125	25/8
1	0	6	6/1
1	Z	3	3/1
1	1	8	8/1

That chip really is a useful signal source. It's a single-chip synthesiser that, with the addition of just a microcontroller, can generate any frequency from 31MHz up to 380MHz with sub-Hz resolution using any of the six frequency variants of the device. Depending on the variant chosen, any frequency up to 3.6GHz is also available, again with ultra-fine tuning resolution. So the original beacon driver module is obsolete, before it even enters service.

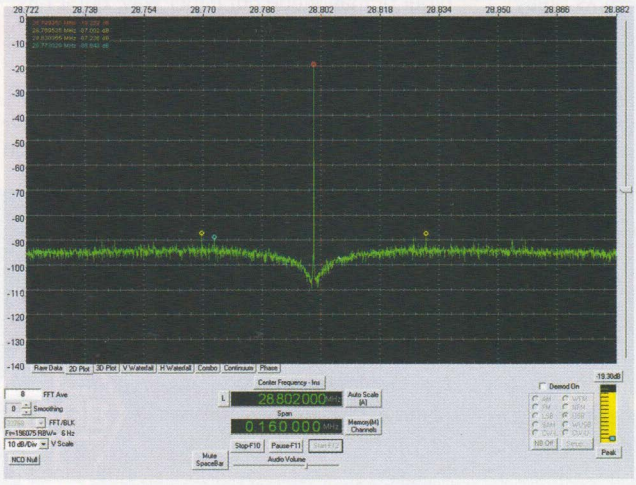

FIGURE 2: Phase noise spectrum of the ICS501.

WEBSEARCH

[1] RS Components: http://uk.rs-online.com/web/

[2] More ICS501 phase noise plots: www.g4jnt.com/DownLoad/ICS-501_PhaseNoise.pdf

[3] Peregrine Semiconductor: www.psemi.com

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HF F-Layer Propagation Predictions for March 2013

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	86.....7778	872....38888	.36334678864	..77778884..	...999998...	...899997...	....7887....	.....77.....
*** Asia								
Yakutsk	.....3..	5653	3.3...567777	..665674....	...667.....	....7.....	.....	.....
Tokyo	.....33..	.....6883.	.....343..	.....	....4.....	.....	....6.....	....4.....
Singapore	.....122.	68872	.....664..	.....265...	.....775...	.....66....	.....65....	.....
Hyderabad	.....	3444	26544	.....564..	.....465...	.....454...	.....45....	.....
Tel Aviv	98.....8888	995....29999	..4....3874.	...3..577...	...888888...	...578886...	....7788....	.....
*** Oceania								
Wellington	.....	.....6...	.....57...	....33346...	.....	.....	.....	.....
Well (ZL) (LP)	.....	.....	..3.....	.....	.....	.....	.....	.....
Perth	.....	.....543.	.....7876.	.....4774..	.....	.....	.....	.....
Sydney	.....	.....787..	.....6886..	.....4787...	.....44....	.....	.....	.....
Melbourne (LP)	.....	..89.....	.6896.....	66.99.....4	...985....5.	...88.....5.	.....	.....
Honolulu	.....	.....	..375.....	....5.....	....4.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....5...	.....	.....	.....	.....
W. Samoa	.....	...2.....	...6533.....	...36773....	....677.....	.....67.....	.....55.....	.....
*** Africa								
Mauritius	2.....222	7.....7887	6.....68877	88753	.....65...	.....5....	.....5....	.....
Johanesburg	.....	54.....3666	77.....9988	9875	.....687..	.....685..	.....67...	.....55...
Ibadan	11.....	67.....1566	666.....6776	..7.....776.	..363..687..	...765678...	...775778...	...674778...
Nairobi	2.....11	86.....7778	65.....5566	.....3666.	..3....576..	.....467...	...655777...	...666775...
Canary Isles	665.....666	877.....3887	8886....7888	745853578886	...99899997.	...9999989..	...6888886..	...488888...
*** S. America								
Buenos Aires	.....	544.....25	7766.....87	3..7.....363	...5.....5..	.....4..	.....	.....
Rio de Janeiro	.....	555.....35	877.....788	4..4.....874	.....7..	.....46..	.....4...	.....
Lima	.....	443.....2	7657.....67	...6.....6.	.....	.....	.....	.....
Caracas	.....	433.....3	8877.....88	5..75....685	....75.3575.	.....66677..	.....76775..	.....7776...
*** N. America								
Guatemala	.....	322.....	6637.....6	...5.....3.	.....	.....	.....	.....
New Orleans	121.....	666.....5	7746.....6	.....5.	.....	.....	.....	.....
Washington	332.....	7773.....6	7357.....67	574	.....5..	.....456..	.....556...	.....
Quebec	665.....25	777.....77	3..5.....664	....4..566..	.....34...	.....	.....	.....
Anchorage	.....	253.....	7375.....356	.....663.	.....67..	.....	.....	.....
Vancouver	.....	.3.....	3.....	.....	.....455..	.....6...	.....	.....
San Francisco	.....	.22.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....5....	.....6....	.....6....	.....6....

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 February, March & April are respectively (SIDC classical method – Waldmeier's standard) 54, 53 & 51 and (combined method) 70, 80 & 82. The provisional mean sunspot number for January was 62.9. The daily maximum / minimum numbers were 107 on 11 January and 24 on 21 January.

Book Review

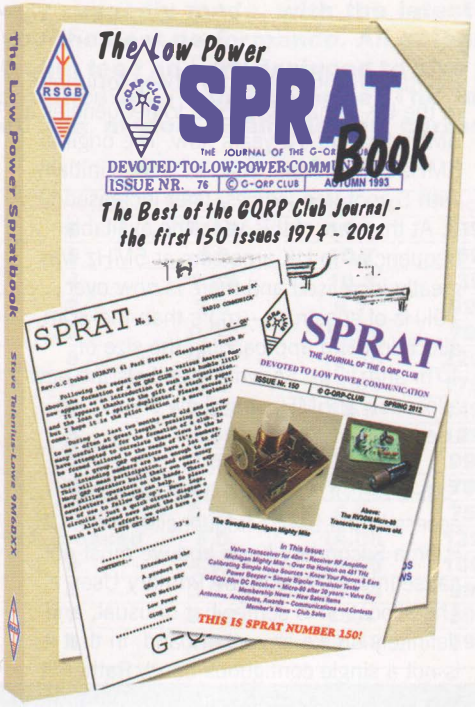
The Spratbook

The Spratbook – a wordplay on 'scrapbook' – bills itself as the best of the first 150 issues of *SPRAT*, the journal of the G QRP club, which is devoted to low power communication and homebrew. Started in 1974 by Rev George Dobbs, G3RJV, the quarterly journal contains roughly one-third news and two-thirds technical material. It is this latter technical treasure trove that has been distilled into the wonderful volume I am examining here.

This is a book for the practical amateur who loves a hot soldering iron as much as sending and receiving signals. It contains oodles of items from full-blown projects to circuit snippets and practical tips. There are chapters on transmitters, receivers, transceivers, antennas, ATUs and Morse keys, but my attention was drawn to the final chapter, Miscellaneous. There I found some 45 pages of diverse delights including a DIY roller coaster coil from two skewers and a piece of choc block, a poor man's spectrum analyser made from 10 cheap components that attach to your oscilloscope and – at last – a suggestion on what to do with all those old, blown fuses you've collected over the years.

I love this sort of book because I know I'm going to find something I can use, something surprising and the fruits of lots of ingenuity. Some of the designs are just circuit diagrams and it is left to the reader to work out a layout, but many have photographs of the prototypes that give you quite a broad hint towards a layout that works. Sometimes this is quite important, eg for the one-FET 100-150MHz regenerative receiver that starts the Receivers section. This also includes a set of building hints as well, which look very useful. PCB foil patterns are provided for some, but component overlays are less common. My jaw dropped, however, when I spotted the Gnat, a 1-transistor HF CW transceiver with full break-in, by Chris Trask, N7ZWY. It's a full project, complete with detailed technical description, PCB and overlay; its design is so elegant that words fail me.

If you're experimentally minded, you'll love this book. It has so much to offer; I think it's a must-have for your bookshelf.

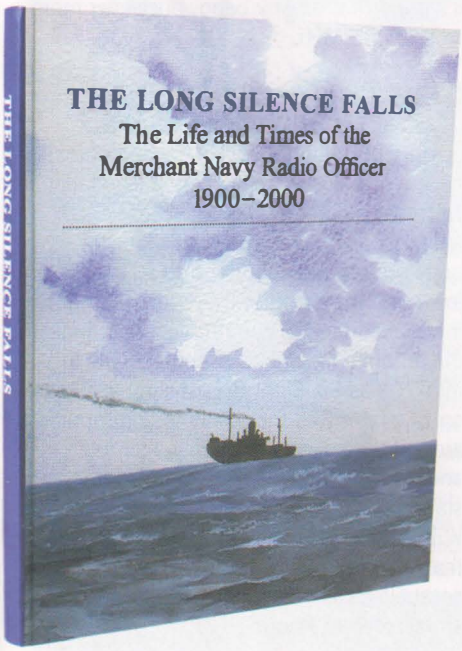


ISBN 9781 9050 8686 3
320 pages, 240 x 174mm
Non Members' price £14.79
Members' price £12.74

The Long Silence Falls

The Life and Times of the Merchant Navy Radio Officer 1900-2000

When I first picked up this book I was half-expecting a maudlin tome that laboriously mourned the disappearance of Radio Officers from the Merchant Navy as their skills were made obsolete by evil satellite technology. But I was completely wrong: this is a joyful celebration and full of vibrant anecdotes and stories drawn from a century of colourful exploits. I found it a pleasure to read. The articles were previously published in The Radio Officers' Association quarterly newsletter, *QSO*; the editors have selected the best stories from 1999 to 2012.



The book consists of eight main chapters plus a Supplements section. The chapters cover areas such as wireless colleges, first trips to sea, life at sea, war stories, The Queens (*Queen Mary, Queen Elizabeth* and a cameo by the *QE2*), flight radio officers, humour and the intriguingly-named East of Suez, West of Panama. That chapter paints a colourful picture of the Middle and Far East by way of the Indian coast, with many stories encapsulating long-gone ways of life (and, in some cases, I thought *deservedly* long-gone). The text is enlivened by 40 pages of photographs, cartoons and a few advert reprints, spread over three sections. The Supplement part of the book comprises two fascinating true stories: a biography of Jack Binns (of *Titanic* fame) and the true story of the first SOS, which was sent by in April 1910 by the *Minnehaha* and not the *Titanic* in April 1912, as popularly believed.

The stories are very human and cover a range of conditions from joy to misery, from enforced idleness to frantically copying the "Press" for cruise-ship daily newspapers – a subject mentioned more than once. Propagation gets the odd mention, too...

To my mind, one of the oddest moments in the book and yet in a strange way the most sensible is a brief description of a cheerless waiting room at the Marconi office in East Ham, where Radio Officers were called to their appointments via a Tannoy system – in Morse!

I found this a delightful book. I'm an appalling sailor, but it had me chuckling at the excellent and generally good humoured anecdotes and stories, although there are also many that are definitely not from that mould. It certainly didn't have the doom and gloom feel I was expecting from the title – on the contrary, I found it to be a fascinating read. Whether or not you have you have the sea in your veins, I recommend it.

304 pages,
225 x 280mm, hardback
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Members' price £19.99 (20% discount)

A New HF Band at 5MHz

A new band available to all UK Full licensees

INTRODUCTION. We have been fortunate in the UK in having access to frequencies at 5MHz for over 10 years now. The original 5MHz Experiment began in 2002, initially with 5 spot frequencies, later increased to 7. At the start of this year, the available frequencies to UK amateurs at 5MHz was greatly increased and there is now over 70kHz of spectrum – more than the 30m allocation and approaching the size of 17m and 12m. So what exactly is the new allocation at 5MHz, and how should we use it?

5MHz ALLOCATION IN THE UK. The access to the 5MHz frequencies in the UK is on a Secondary basis and we must not cause interference to the Primary User. The allocation is somewhat unusual, and definitely unlike any other band, in that it is not a single contiguous band. Rather, it is a block of 11 band segments within the 5.25 – 5.41MHz frequency range with all the old spot frequencies lying within the new allocation. As previously, a Notice of Variation (NoV) is required for operation, and it is now a very quick and simple online process via the RSGB website [1]. The NoV is only available to Full licence holders, so there is a real incentive to upgrade!

The 5MHz allocation is shown in Table 1. There has been no band plan enforced on us and, as there is no international Amateur Service allocation at 5MHz, there is also no IARU band plan. However, compatibility with the old spot allocations and activity in other countries has already created some patterns of where activity on various modes can be found. In general, operation has followed the convention of the other HF bands with CW at the bottom of the band and SSB at the top. The main exception to this is on specific spot frequencies where international QSOs in any mode can often be found, and the most common of these frequencies are also shown in the table.

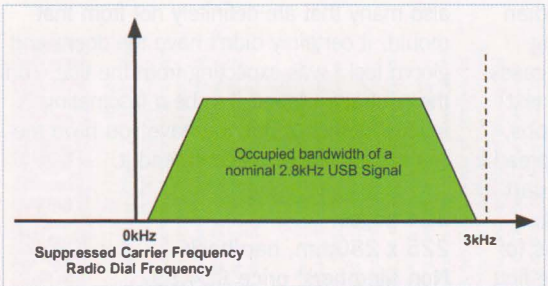

FIGURE 1: A USB signal.

PHOTO 1: The No 19 set.

Upper sideband (USB) is recommended on 5MHz. This is to maintain compatibility with the Primary User as well as international convention.

The three propagation beacons set up during the 5MHz Experiment, GB3RAL, GB3WES and GB30RK are still operational on 5290kHz, so this frequency should be kept clear at all times, in common with the beacon sub-segments of the other bands. Full details of the beacons can be found on the RSGB website [1].

In keeping with our position as a Secondary User of the band and the requirements to avoid interference to the Primary User at all times, no contest activity should take place on 5MHz and it joins the 30m, 17m, and 12m WARC bands as a refuge from contest activity during busy weekends.

There are a few other significant differences from the other HF bands, full details of which are in the NoV. Power is restricted to 100W maximum into the antenna, the maximum radiated power must not exceed 200W EIRP and the antenna height is not to exceed 20 metres.

SIGNAL OCCUPANCY. Probably the biggest single difference between 5MHz and any other HF band is that the band segments are extremely narrow; this brings with it the danger of operating out of band if the occupied spectrum of the transmitted signal is not fully understood and carefully observed. The most likely cause of accidentally operating out of band will occur when operating USB by setting the frequency of the radio too close to the upper edge of the band segment. It is important to remember that the entire signal must stay within the limits of the frequency segment. With USB, remember that the transmitted signal will start from the dial frequency, or suppressed carrier frequency, and extend up to 3kHz above the dial frequency, as in Figure 1. Therefore the USB dial frequency should never be set higher than 3kHz below the upper limit of the frequency segment.

As an example, an operator wishes to select a USB frequency in the 5378 – 5382kHz segment. This narrow band segment of just 4kHz has only sufficient space for a single SSB signal. The highest dial frequency that can be used is 5379kHz, as this will result in the signal occupying the range from 5379kHz to 5382kHz. Note the danger of assuming that 5380kHz is a good frequency just because it is right in the middle of the segment – the transmitted spectrum will extend well outside the band, see Figure 2.

In another example, at 5403.5kHz, the segment is only 3kHz wide and extends from 5403.5kHz to 5406.5kHz, therefore the only frequency that can be used is setting the dial to exactly 5403.5kHz; anything higher or lower will result in the transmitted signal being out of band.

There has been considerable interest in AM since the new frequencies were released, and AM nets can often be heard on 5317kHz. Note the sensible choice of frequency: a wide segment but in the lightly-used middle of the band, away from the edges but still leaving room for an SSB QSO within the same segment at 5320kHz.

Take time to learn and understand the relationship between the indicated frequency on the radio dial and the occupied spectrum of the transmitted signal; it's important on any band, but never more so than at 5MHz.

COMMUNICATION WITH MILITARY CADET STATIONS. Anyone who has operated during the 5MHz Experiment will have heard and possibly contacted stations with non-amateur callsigns. These are military cadet stations from CCF or ATC units around the country and, for quite a few current amateurs, they were the first introduction to HF communications. Indeed, the author's first ever HF contact was in the mid-70s as Six Eight Bravo using a 19 set on 5MHz! It was the ability to communicate around the country with only a simple aerial and a few watts of AM that started a long standing interest in HF communications. With AM now permitted on 5MHz, some of that same ex-military equipment is being enthusiastically restored and returned to the air, as seen in Photo 1 [2].

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6M4	6	4	1.92	10.3	139
6M3	6	3	2.6	8.7	99
6M Moxon	6	2	0.92	5.99	79
4M8DXX	4	8	8.3	13.56	229
4M7DX	4	7	6.6	13.09	179
4M6DX	4	6	5.23	12.5	149
4M5DX	4	5	3.35	10.7	129
4M4DX	4	4	2.56	10.4	99
4M3DXS	4	3	1.48	7.78	79
4M Moxon	4	2	0.62	6.0	75
2M9DXX	2	9+9 crossed	5.0	14.05	139
2M9DX	2	9	4.99	14.05	109
2M8DX	2	8	3.92	13.54	99
2M7DX	2	7	3.32	13.1	89
2M6DX	2	6	2.62	12.42	79

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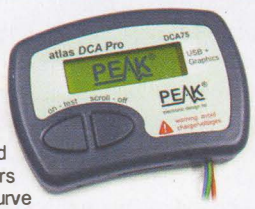

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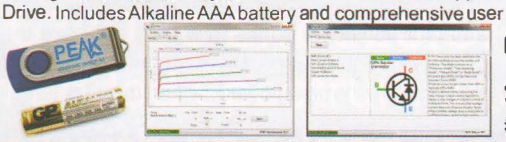

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Communication with the cadet stations is still permitted under the new NoV, although it must be noted that whilst they are allowed to use our frequencies, under no circumstances are we allowed to contact stations on any frequency outside the allocations we have. Their callsigns are an interesting addition to any logbook entry and, more importantly, it demonstrates that amateur stations can effectively operate in inter-service networks and are a valuable resource in emergencies.

PROPAGATION AT 5MHz. Lying between the widely spaced 80m and 40m bands, propagation at 5MHz, or 60m, has some unique attributes. During the day, it is ideally suited to intra-UK contacts using low power and simple aerials. The propagation mode is Near Vertical Incidence Skywave (NVIS), whereby the signal travels almost vertically up from the antenna and is reflected back by the ionosphere in a circle that extends from around 30 – 600km from the transmitter. Often the best type of antenna for this mode of operation is also the simplest: a low dipole or doublet close to the ground, giving plenty of high angle radiation. As night approaches and the critical frequency starts to drop down below 5MHz, the propagation will suddenly change, often in the space of just a few minutes. UK signals will disappear and the NVIS propagation is gone, to be replaced by the more familiar night time skywave propagation with a definite skip zone, similar to 40m after dark. Night time activity on all modes tends to congregate around the international spot frequencies, such as 5258.5kHz, 5398.5kHz, 5371.5kHz and 5403.5kHz. US stations in particular can be heard on these last two frequencies once the path is in darkness.

INTERNATIONAL OPERATION. The UK is by no means unique in having access to frequencies at 5MHz. But although many countries permit amateur activity in some form, it is by no means consistent and can be confusing to understand what is allowed, and where. As a general guideline, the use of specific spot frequencies is the most common, with some countries, particularly in Scandinavia, having access to 150kHz or more of contiguous spectrum. There are excellent resources on the web that cover the 5MHz allocations worldwide [3].

Be courteous if you receive a request to change frequency slightly and try to avoid long rag chews on the known international spot frequencies, or at least listen for stations that may wish to join in. As usual, the frequencies at the very top and bottom of the bands tend to be busiest, with plenty of space in the middle. Perhaps less obviously, be considerate when selecting a frequency for intra-UK operation that the chosen frequency does not prevent operation on an international spot frequency. For example, selecting a USB frequency 0.5 or 1kHz above or below the indicated frequency for international use will unnecessarily prevent a QSO on the international frequency and, while the UK stations can QSY, the international stations may not have that ability. The easiest is to either use a known spot frequency, or ensure it is left clear for others to use.

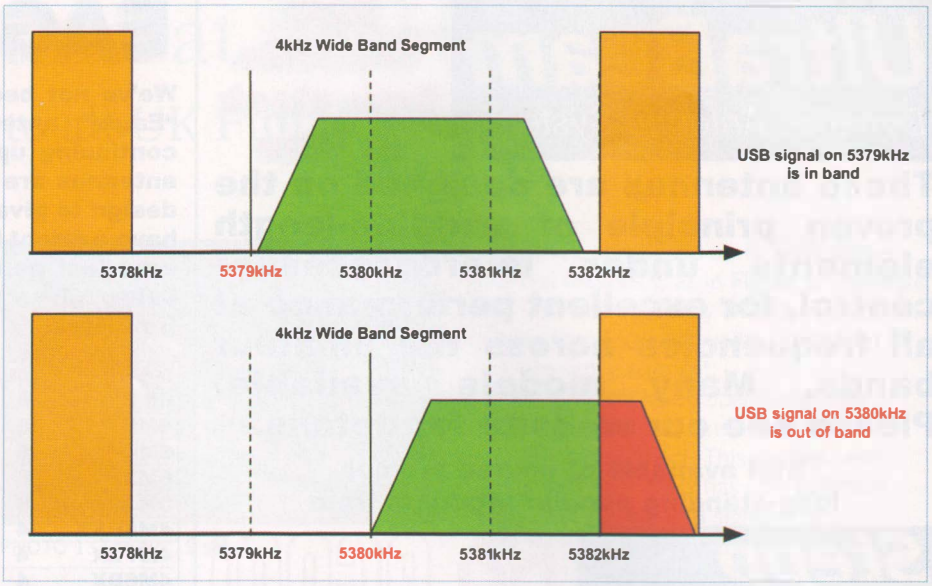

FIGURE 2: A USB signal on a 5MHz channel.

WORLD RADIO CONFERENCE 2015. WRC15, to use its common abbreviation, is the next gathering of the ITU member states to negotiate international frequency allocations. Of particular interest to radio amateurs is agenda item 1.4, which is to consider the possibility of an amateur allocation within the band 5250 – 5450kHz. The RSGB, in conjunction with other IARU societies, is already deeply involved in preparing for WRC15 and a positive outcome. In the meantime, we are fortunate to already have access to parts of the band and it will greatly help our prospects at WRC15 if we can demonstrate we are able to use 5MHz in a manner that is compatible with the Primary User.

SUMMARY. We have progressed from a few spot frequencies at 5MHz to a significant new allocation that is already gaining activity and support. It is an excellent experimenter's band with plenty of space available and probably one of the easiest HF bands to operate on, requiring only simple antennas and low power for UK wide contacts. And with propagation characteristics that are markedly different from the neighbouring 80 and 40m bands, it really is a new band at HF.

TABLE 1: The UK 5MHz allocation. CoA = Centre of Activity.

Lower limit kHz	Upper limit kHz	Notes on current usage
5258.5	5264.0	CW activity, 5262kHz QRP CoA, 5258.5kHz international use.
5276.0	5284.0	5278.5kHz international use and emergency CoA.
5288.5	5292.0	Beacons on 5290kHz. WSPR.
5298.0	5307.0	All modes. Highest USB dial frequency 5304kHz.
5313.0	5323.0	All modes. 5317kHz AM activity. Highest USB dial frequency 5320kHz.
5333.0	5338.0	Highest USB dial frequency 5335kHz.
5354.0	5358.0	Highest USB dial frequency 5355kHz.
5362.0	5374.5	Digital modes activity. Highest USB dial frequency 5371.5kHz; international use.
5378.0	5382.0	Highest USB dial frequency 5379kHz.
5395.0	5401.5	Highest USB dial frequency 5398.5kHz; international use.
5403.5	5406.5	USB dial frequency 5403.5kHz; international use

REFERENCES:
[1] RSGB 5MHz website: www.rsgb.org/committees/spectrumforum/5mhz.php
[2] Wireless Set No 19. Photo copyright Ian Underwood, MOYMK. VMARS website: www.vmars.org.uk
[3] Worldwide Amateur 5MHz Allocations from G4MWO: http://tinyurl.com/82rwq2b
UK 60m Band from G3NRW: http://homepage.ntlworld.com/wadei/UK_60m_band_utilization.htm
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ATV

Feedback and developments

Some of the major ATV themes in 2012.

UPS AND DOWNS. It is traditional to summarise the past highs and lows at the end of a year. On the bright side, quite a few readers have now become ATVers. Many have built the 23cm PA from the March 2011 ATV column, had a go with some of the 'gizmo' test circuits and are using their own test and identification cards. Feedback received has been useful, often stimulating input for future columns. The November column about audio hoot-round is a case in point. The simple 'inverting' analogue circuit, circa 1980, was the most played-with. I'm still awaiting comments about publishing details of a digital version!

Due to the interest in the simple analogue delay circuit, the better, 'non-inverting' single supply version is worth a mention – see Figure 1. There are two immediate advantages. First, the higher input impedance of the IC in this configuration, limited only by the value used for the two half-voltage bias resistors, improves/increases the time delay. Second, almost the full gain of the amplifier is now available, where before it was mainly used to compensate for losses through the delay components. You may have noticed that the 'inverted' input still has the same associated resistor values that give the amplifier a voltage gain of 26dB. However, R4 is now connected via a series capacitor to the 0V line, providing an AC 'virtual earth' at pin 3 without upsetting the DC bias.

BATC. Video streaming from the BATC website [1] has gone from strength to strength, providing worldwide linkup of special ATV activities, conferences, repeaters and news, notably the UK's GB2RS. The 2012 BATC BiAGM and Conference was a great success. Its theme was new amateur digital generation methods such as the DigiLite system. I understand that work continues with a view to producing a standalone system, ie a no-computer (or built in micro) version. I recently had a quick look at a digital videosender system that is available from at least a couple of sources for £40-£60 [2]. The system uses "Wi-Fi techniques with 16QAM/QPSK/BPSK modulation and frequency hopping". It works well, but a bit more investigation is needed to make it ideal for ATV use. A word to the wise: many 'digital' video senders found on the web do not transmit a digital signal; they are for 'digital equipment with a composite video output'.

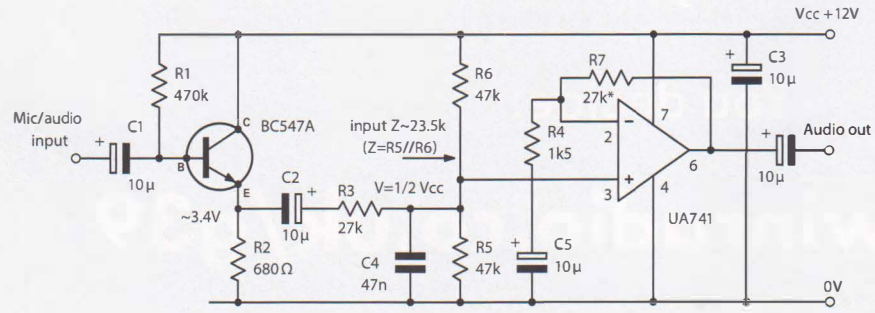

FIGURE 1: Analogue non-inverting anti-hoot circuit that gives around 26dB voltage gain with the 27k/1k5 resistor combination shown.

THREATS TO ATV BANDS. There have always been threats to the frequency bands used by amateurs. On many we are Secondary users, meaning we have to defer to the Primary user's requirements. The (formerly much wider) 70cm band was apparently originally made available specifically for AM ATV. But now, the impression to a newcomer is that ATV is not possible here. However, with the recent use of relatively narrowband digital transmissions, a single channel is possible at the top of the 70cm band. This is now in regular use, particularly for DX operation.

There is increasing pressure for GPS and GSM use of the 23cm band, with parts of the 13cm band 'subject to regulatory change' – along with the requirement for non-interference to ISM users. It does not stop there. Look at the band plan and the accompanying Notes in last month's *RadCom*. Current thinking is that the use of digital ATV transmissions may ease the problem, but my personal view is that sensible use of correctly set up, minimum deviation FM ATV should not be abandoned, particularly as it is still the most readily available and cost effective system for the newcomer to ATV.

OTHER PROBLEMS. Several ATV repeater groups have lost their sites in recent years due to high commercial rents. The Home Counties ATV group has found a possible new 'friendly' site that calculations and practical checks indicate has an acceptable RF capability for the majority of the wanted coverage area. Fingers are tightly crossed that it will have its NoV reactivated soon.

DIY CAMERA STABILISER. A search on the internet revealed full construction information for a '$14 Steady Cam' by Johnny Chung Lee [3], including a variation for working with a camera close to the ground. Enjoy!

WEBSEARCH

[1] www.batc.tv

[2] Search for digital video sender at www.cpc.co.uk

[3] For the main stabiliser page, see www.littlegreatideas.com/stabilizer/diy/ – there's a tutorial at www.youtube.com/watch?v=QhMYBjdHPeU and an alternative PVC version using sand as the stabilising weight at www.instructables.com/id/How-to-Build-a-PVC-Steadicam-14-Steadicam-Redux/

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Shopping online with ML&S is safe and secure. E&OE

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I was going to write some words for the New Year but I thought one of our customers would do a better job;

"Thanks for all the work carried out by your team. Special thanks to Steve who kept me up to date with every thing that was going on. No one could foresee that both radio and PSU were both faulty. Again many thanks. You have a very professional and well mannered team Mr Lynch, please keep them. Merry Christmas to all and a Happy New Year. Chris - MI0CBH

Thank you Chris & to all the many thousands of customers that support my business year after year. Without you we wouldn't be here.

KG-UV6D 2/70 FM Transceiver

The KG-UVD1P was the UKs best selling Dual band Handie.

Meet the New Enhanced Featured, Superior Build KG-UV6D.

Only £94.95 and that still includes a Base Charger, Li-ion Battery, Antenna & Belt Clip.

Quote RadCom & you can even get FREE CARRIAGE*

* UK Mainland only. Jan / Feb 2013 only.

At last, a budget priced FULL DUAL BAND MOBILE from the famous Wouxun brand

New KG-UV920P

Multi-band Transmit/Receive - RX: 66-108MHz (100kHz spacing) 136-174MHz & 350-480MHz. TX: 144-145MHz & 430-440MHz. (136-174 + 400-480MHz export). Dual Receive - Dual band simultaneous reception

- ✓ Frequency Range: 144-146 & 430-440MHz RX: 136-174 & 400-480MHz
- ✓ Dual Receive - Dual band simultaneous reception
- ✓ Dual Display - Wide LCD dual frequency display, with independent operation
- ✓ Over 999 Memory changes - Different areas division
- ✓ Strong and Stable RF Power (VHF: 50W / UHF: 40W)
- ✓ Front Panel Separation - Convenient panel separation function simplify special installation
- ✓ Cross-band Repeat - UHF & VHF cross-band repeat capacity
- ✓ Dual Mobiles Same/Cross-band Repeat
- ✓ QT/DQT
- ✓ Humanized Speaker Setting
- ✓ Caller ID Function - Shows the caller's ID code
- ✓ Group Calls, All Calls and Selective Calls

Free remote head lead with first orders.
Price: £229.95

The KG-UV6D "Pro-Pack"

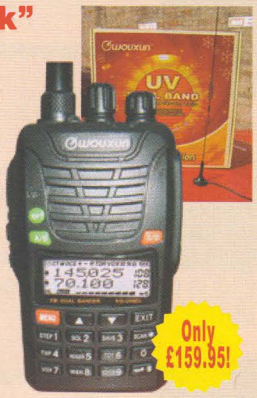
There was only one thing missing in the ProPack - a dual-band mobile antenna! There isn't anymore! Buy a new KG-UV6D with the most popular accessories **all bundled together for a very special price.**

- ✓ KG-UVD6D New Dual Band Handie
- ✓ Dual Band Mobile Antenna
- ✓ Desk Top Charger (110-234v & 12V input) & Power Cord
- ✓ Cigar Car Charger
- ✓ Headset with PTT & Mic
- ✓ Eliminator
- ✓ Remote Mic/Speaker
- ✓ Leather Case
- ✓ 1300mA Li-Ion Battery
- ✓ 1700mA Heavy Duty Li-Ion Battery
- ✓ AA Empty Cell Case
- ✓ PC Programming Lead
- ✓ PC Drivers & Software

In 2011, the Wouxun KG-UVD1-P was the best selling Handie in the UK. In 2012, ML&S introduce the new improved **KG-UVD6D.**

Better still, **at only £159.95 including ALL listed accessories,** you save yourself a massive £50.00!

Quote RadCom & you can even get FREE CARRIAGE*
* UK Mainland only. Jan / Feb 2013 only



See **www.WOUXUN.co.uk**

KG-UV6DL

4m + 2m Handie

To replace the KG-UVD1PL, this new version offers the same features as its 2/70 brother but on the very popular 70MHz & 144MHs bands.
£99.95

KG-679E/2M

2m FM Handie
Also available for 70cm!

KG 679E/2M **£59.99**

KG-679E/U 70cm (400-470MHz) **£64.99**

or with Voice Scrambler KG-689E/U **£69.99**

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KENWOOD

TS-590S HF/6m Transceiver

Latest HF & 6M FULL DSP Base Transceiver from Kenwood

The TS-590S is our best selling HF Transceiver in 2012. ML&S have sold more of these than any other dealer in Europe.

AVAILABLE FROM STOCK.
£1199.95 (RRP: £1499.95)

Call store for best finance package.

Add an MC-60A DESK MIC worth £119.95 for only £110!

STOP PRESS!
Kenwood announce their new Flagship Base Transceiver – The TS-990S

JVC KENWOOD Corporation is proud to announce a state-of-the-art Amateur transceiver scheduled for worldwide launch under the Kenwood brand in the winter of 2012. Featuring a dual TFT display and dual receiver, the TS-990S is a top-of-the-range flagship model in the Kenwood Amateur radio line-up.

see www.hamradio.co.uk/ts990

TS-2000E HF-70cm Auto ATU Base **£1469.95**

TH-F7E Dual Band with all-mode scanner built in **£239.95**

TH-D72E New FM dual band transceiver **£429.95**

TM-V71E 50W 2/70 Mobile **£299.95**

PS-60 Matching PSU for TS-590/2000 **£299.95**

TS-480SAT 100W HF+6m Auto ATU Mobile/Base **£779.95**

TS-480HX 200W HF+6m Mobile/Base **£879.95**

TS-2000X HF-23cm Auto ATU Base – "A complete shack-in the-box" **£1699.95**

TM-D710E 2/70 Mobile/Base with APRS & TNC. **£445.95**

MC-60A Deluxe Desk Microphone **£119.95**

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YAESU

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

Special Yaesu FTdx3000 Day. Saturday February 23rd.

ML&S are holding a presentation day, with special attention and demonstration of this new model.
Special finance arrangements on outright purchases will be available in store on the day and part-exchange is always ML&S's speciality.

Sales of FTdx3000s will be accompanied by Yaesu freebies and free refreshments too!

Doors open 9:00am on Saturday February 23rd and close at 4:30pm.

All models in stock NOW. Best prices GUARANTEED.
Call if you find one cheaper.

BASE / MOBILE

New Yaesu FTdx3000 HF/6m Base
NOW AVAILABLE - LIMITED STOCK. ONLY £2399.95
The new FTdx3000 HF+50MHz 100 Watt Transceiver is another exciting new product that is certain to capture the hearts of determined DXers and Contesters as well as casual operators looking for solid communications.

FT-950 Base Transceiver
Only £41.32 p/m!
£126.50 Deposit 36 x £41.32
A "proper size" HF/6m Base Station offering 100W output on all bands.
Add the MyDEL MP-925 power supply for only £1339.95 combined.

FT-dx5000 HF Base Transceiver
Price is £4399.95
FT-dx5000: Only £143.73 p/m! £440 Deposit 36 x £143.00
FT-dx5000D: £4699.95 **FT-dx5000MP: £5099.95**

New Yaesu FT-450D
Only £27.62 p/m!
£85 deposit
36 x £27.62
Following on the success for the FT-450 original, the FT-450D has many improvements and comes fitted with the Auto ATU as standard.

Yaesu FT-2000
The DX Choice of 3B7C
from only £73.12 p/m!
£225 deposit 36 x £73.12
FT-2000D: **£2799.95**

Yaesu FT-857D & ATAS-120A Package
160m-70cm HF Base/Mobile. Still our best selling HF Mobile Radio.
FT-857D + ATAS-120A: £999.95
FT-857D Only £23.72 p/m! £73 deposit 36 x £23.73

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

IF-2000
IF Interface board for the FT2k & FT-950 **£219.95**
Both on DEMO at Chertsey

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

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

MOBILE

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

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

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

ML&S Price £389.95
Yaesu FT-8900
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 FTM-350AE
NEW VERSION!
Dual Band APRS FM 2/70 mobile with huge display.

NOW BACK IN STOCK!
Yaesu FT-817ND
All Band All Mode Portable Transceiver
ML&S price only £534.95

HANDIE

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

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

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

New! Yaesu FT-1D
Very first Dual Band Full Digital Handie using C4FM & FDMA Digital technology.
Price TBA

Yaesu VX-7R
Black or silver triple band handie
£309.95

Yaesu FT-270E
2M 5W Handie
£109.95

Yaesu FT-60E
Twin band handie
£179.95

Yaesu VX-6E
2/70 handie
£259.95

Yaesu VR-160
Miniature commu-nications receiver
£199.95

Yaesu Rotators

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

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
GC-038 Lower Clamps £34.95
Rotator Cable 25m with plugs fitted £69.95
Rotator Cable 40m with plugs fitted £123.95
Rotator Connector plugs £25.95

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

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.

Take a look at our brand new website!

www.HamRadio.co.uk

ML&S - Icom UK's Largest Ham Radio Dealer

ICOM

Full Icom range always in stock!

New Icom IC-7100

The IC-7100 has been carefully designed to reignite Amateurs' interest in mobile communications and brings digital communication opportunity to a wider range of Radio Amateurs.

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

Planned features include:

- Slanted front separated controller with large touch screen dot matrix LCD (controller cannot be attached to body front)
- Speaker is self contained inside the controller
- Full mode (SSB, CW, AM, FM, RTTY decode) and D-STAR DV
- HF (100W) / 50MHz (100W) / 70MHz (50W) / 144MHz (50W) / 430MHz (35W) (Note: Power may be different according to version. The 70MHz band is available for some versions only)
- Lower current consumption / cooler operation (compared with the IC-7000)
- SWR meter function also works for VHF and UHF bands
- Remote power on / off
- IF DSP for filtering / interference removal / noise reduction
- SD memory card slot, voice recording
- USB Audio In / Out, remote control
- +/- 0.5ppm frequency stability
- 505ch memory channels

Further details about its features and options have been made available on a pre-release product information sheet. The IC-7100 pre-release information can be downloaded from our website.

At the moment we do not have any information about release date or price but please stay tuned!

Icom RC-28 Remote IP Controller

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

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

HOT OFFER! IC-7000 + LDG Z-100Plus

What a perfect pair!

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

Only £1179.95
Whilst stocks last
Saving £330 off RRP!

The New Icom IC-9100

HF through to 23cms Base Transceiver

ML&S Price: £2899.95 available ex-stock

Or Plus 4 Pack only £3799*

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.

Icom IC-7410

100W HF+50MHz base station transceiver

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

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

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

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

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

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

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

Icom IC-7600

This Mid-range HF base station from Icom has arguably the best screen for user interface in the business.

NEW LOW PRICE. ML&S Only £2999.99

Icom HF Products

IC-718	£Call
IC-7200	£829.95
IC-7000	£1189.95
IC-7410	£1599.00
IC-7600	£3279.95
IC-7800	£Call!
IC-PW1Euro	£4699.95

Icom Receivers

IC-R9500	£Call!!

Icom V/U Products

ID-31E	£349.95
IC-V80E	£105.00
IC-T70E	£158.25
IC-E80D	£329.95
ID-E880E	£439.10
IC-E90	£239.95
IC-E90/4m	£299.95
IC-E92ED	£388.95
IC-E2820	£485.95
IC-E2820 +UT-123	£699.95

WiNRADiO

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 9kHz to 49.995MHz. **£1599.95**

WINRADiO WR-G31DDC XCALIBUR £699.95

FlexRadio Systems® Software Defined Radios — The Flex Store at ML&S

FLEX add the ULTIMATE SDR to their product range - The FLEX-6000 Signature Series. Due first quarter 2013

Flex-6500 1.8-60MHz, 4 Slice RX SDR 100W Transceiver	£3349.95
Flex-6700 1.8-60MHz, (+RX 135-165MHz) 8 Slice RX SDR 100W Transceiver	£5799.95
Flex-6700R as above, Receiver only	£4799.95
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	£1379.95
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

New! MODEL Explorer 3G Combo

Hand Held Spectrum Analyser 15MHz-2.7GHz

Up until now the RF enthusiast have had to limit themselves to cheap "RF Power Detector / Frequency counter" devices. But these are limited to display data for a single point of maximum power, and traditionally power metrics are too unreliable, in the order of 20dB or even 30dB inaccuracy.
In contrast, a spectrum analyser like RF Explorer will display full frequency spectrum in the band, including carrier and modulated shape, it will display Spread Spectrum activity, if that exists, and will show bandwidth to monitor collisions, frequency deviation from expected tone, etc.
For full details see web.
ML&S: £224.95

AirNav RadarBox & RadarBox-3D

AirNav Systems — The Most Trusted Name In Flight Tracking

RadarBox-3D Version. ML&S: £489.95

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

Software Defined Receiver

RFspace

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.

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 2m **New model**, provides 70cm access for use with D-Star Radio. **£249.95**

DV-Dongle A quick efficient way of gaining access to the D-Star network via your PC. **£169.95**

Looking for the best USED EQUIPMENT? See www.HamRadio.co.uk/used

New Model! FUNcube Dongle Pro+

This remarkable memory stick-sized device was conceived, designed, built and bought to market by its inventor, Howard Long G6LVB.

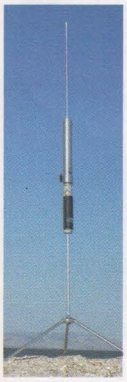
- Coverage is from 150kHz (yes, that's kHz) to 1.9GHz.There is a gap between about 250MHz to 410MHz. There isn't a gap anywhere else.
- Eleven discrete front end filters, including some really, really serious SAW filters for 2m and 70cm
- 0.5ppm TCXO
- Much improved phase noise
- Better Dynamic Range by up to 7dB
- Tuner PLL Steps from memory
- All this plus more and still no drivers required!

After the worldwide success of the FUNcube Dongle, many of you have noticed that we've been out of stock and waiting for new deliveries. Howard Long, the FUNcube inventor decided to take into account feedback by many FCD users with a redesign he is calling the FUNcube Dongle Pro+. Howard thinks that you will find that the results are very worthwhile (actually so do we!). There are many enhancements both in performance, extended range and features.

The price is only £149.99
NOW IN STOCK!
And for more details see:
www.hamradio.co.uk/funcube
For full specification see our website.

INTRODUCING THE EXTENDED RANGE VERSION, the FUNcube Dongle Pro+. Not only has it got a frequency range of **150kHz to 240MHz & 420MHz to1.9GHz** but this new design has on board filters for the lower frequencies.

New Super Antenna MP1 SuperStick



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

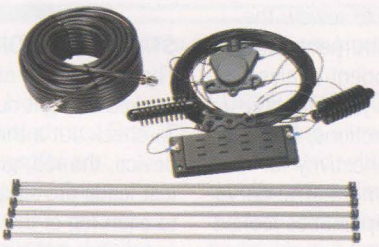
Product features:
- Ham bands: 40m-30m-20m-17m-15m-12m-10m-6m-4m-2m-70cm
- Frequency Range: HF 7MHz~30MHz continuous
- Frequency Range: VHF 48 to 144MHz continuous
- SWR: 1.5 : 1 or better
- Rated Power: 500W SSB; 300W CW / DIGITAL
- Antenna Weight: < 2 pounds (1kg)
- Also configurable for up to 450MHz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

Only £139.95 including the 80m Coil FREE!

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

Looking for a wire antenna that will operate from 160m – 10m with no ATU, right out of the box?

You've just found it. The Yaesu YA-30.



This design was originally manufactured for military use and thousands have been deployed around the world. Take the assembled antenna out of the package, snap in the included spreaders, string it up preferably no lower than 15' off the ground and you have an antenna system that needs NO ATU and offers continuous coverage from 1.8-30MHz.

The RRP is £309.95 ML&S: £199.99 plus carriage. See web!

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 Pro with Bluetooth 100kHz-200MHz
£339.95

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

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

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

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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.

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

The UK's favourite rig-mounted antenna system!

NEW! WonderWand Widebander
1.8-460MHz with Monster 1.8M Whip! £129.95
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NEW at ML&S

SU/Z300S
VHF/UHF antenna Gain: 2.15/3.8dB 150w H:0.32m £16.95
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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 OFRG-188THIN CABLE PL £24.95
SU/UT106-SMA-female 2/70 MiniMag
2m/70cm V+U Mini-Mag with replaceable whip, 35cm with 4m cable terminated with reverse SMA female plug. Ideal for Wouxun range of handies £12.95
SU/UT106-SMA-male 2/70 MiniMag
2m/70cm V+U Mini-Mag with replaceable whip, 35cm with 4m cable terminated with reverse SMA female plug. Ideal for Wouxun range of handies £12.95

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

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

Peak Atlas DCA PRO

A very capable component analyser

INTRODUCTION. Having owned one of the original Peak Atlas DCA55 component analysers for a good few years now, I find it a particularly useful tool for identifying that odd unmarked part and its connections. So I was pleased to be able to review the latest offering from Peak Instruments, the DCA75 (or DCA Pro) component analyser, which can do far more than just identify component types and connections. Not least, it offers computer connectivity for proper component measurement. The curve plotting and data capture capabilities looked particularly intriguing.

The DCA Pro is built into the same size case as all the other products from this company: a small handheld plastic case that has two pushbuttons and a liquid crystal display on the front panel, giving the user interface for standalone operation. Three coloured test leads terminated in instrument clips are used to connect to the component under test; a micro USB connector on the rear edge optionally interfaces to a PC using the supplied cable.

The unit is supplied as a complete ready to go package, with the USB interface lead and a 0.5GB USB memory stick that contains the operating software for PC operation. There is also an instruction manual and a separate A4 sheet of paper with software installation instructions. Read this first; it is important the unit is not connected to a PC before the software has been installed.

Unlike the older DCA55, the DCA Pro runs from a single 1.5V AAA size alkaline battery. This is a big improvement over the expensive and hard-to-find 12V batteries used in Peak's earlier products. To insert or change the battery, you have to remove the three self tapping screws that hold the case together, revealing the spring battery holder that is mounted in a cut out in the PCB. The unit supplied already had the battery installed.

STANDALONE OPERATION. The component analyser worked straight out of the box. To check out a three terminal device, the red, green and blue test leads are simply clipped to each leg of the device. The order does not matter; the analyser itself works out which way round it is connected. For two terminal devices, any two leads can be chosen.

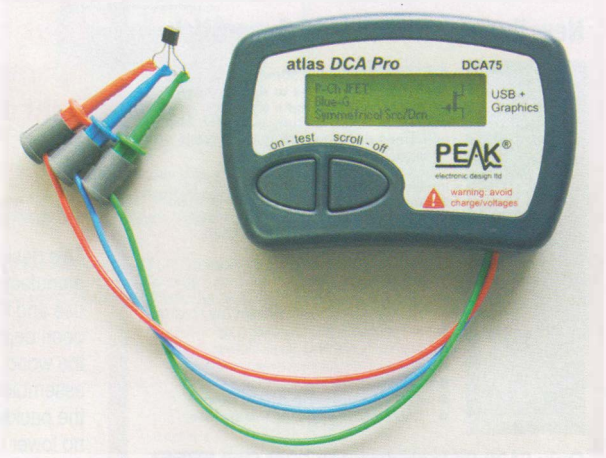


PHOTO 1: The DCA Pro correctly identified this randomly-chosen component as a P channel FET, and even identified the gate lead (see text).

For my first checkout, without even bothering to look at the manual I grabbed the nearest three terminal device lying nearby. It happened to be a 2N3820 P channel junction FET. I connected the three test clips and pressed the left-hand ON button. The unit bleeped, then showed a short introductory message followed by a few lines of text showing the device type and its connections, together with a graphical symbol of what is connected, as shown in **Photo 1**.

Initially I was a bit surprised to see the "Symmetrical Src/Drn" message, but if I'd bothered to read the manual first, it does state that junction FETS are often symmetrical around the source / drain terminals. The 2N3820 proved to be so – hence the message. By pressing the right hand button, the display scrolls one line at a time to show in turn the gate cutoff voltage for 1μA drain current, then the gate voltage for 5mA drain current followed by a range of other values for characterising the device, including the transconductance and saturation current.

Once I eventually settled down and studied the manual properly, it became apparent the DCA Pro can measure an awful lot more semiconductors than the earlier tester can cope with. Apart from all types of diodes, bipolar transistors and three terminal FETs, it can also identify and measure Darlington transistors, MOSFETs with internal diodes, IGBJTs (a type of hybrid FET / bipolar power device), SCRs, TRIACs and Zener diodes up to about 9V rating. It can also manage LEDs (where it even attempts to identify the colour using the forward voltage) and dual diodes in three terminal packages – and even some voltage regulators.

So, of course, I went through the junk box trying every type of component it could manage and, apart from a few extreme cases, every one was identified correctly. Two-lead red-green anti-parallel connected

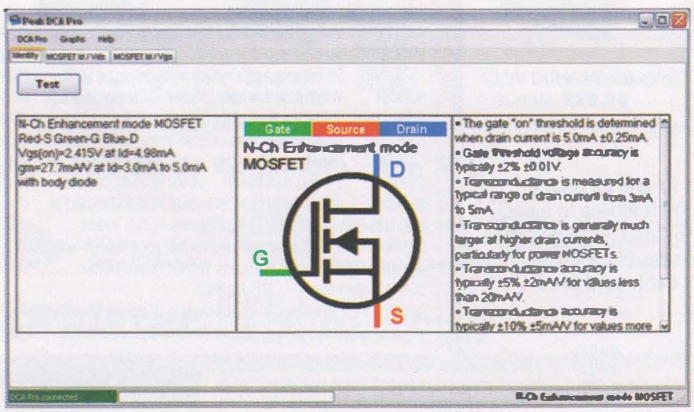


FIGURE 1: Typical test result PC screen, identifying the component type, connections and general component data.

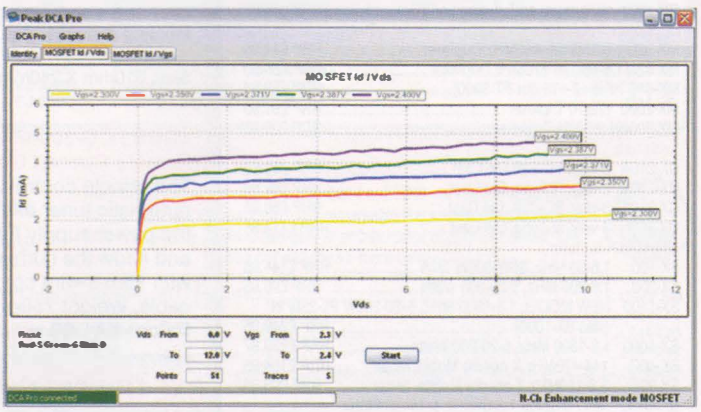


FIGURE 2: Typical default curve trace (see text).

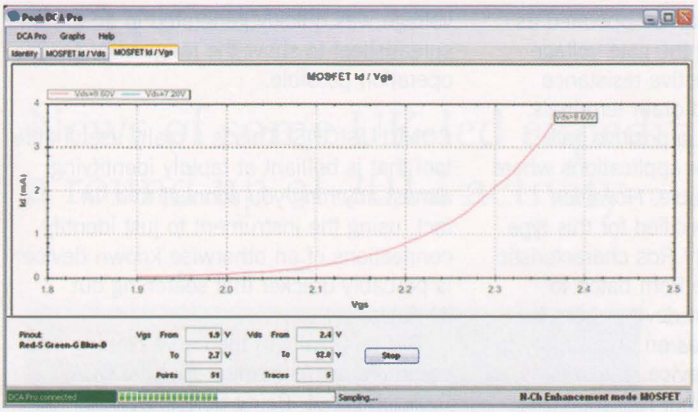


FIGURE 3: Drain current versus gate volts plot.

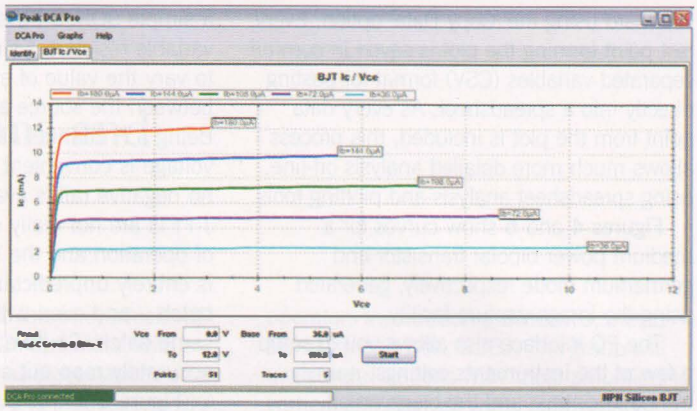


FIGURE 4: Curves for a medium power bipolar transistor.

LEDs were recognised and labelled without error, although it did get a bit confused with yellow-green types due to the similarity in forward voltage for each colour. The biggest surprise was a high power RF MOSFET. I expected this either to have too much leakage or something that the low test current of this analyser would fail to measure properly. But no, it correctly showed a MOSFET symbol, gave a valid Vgs and a transconductance of several tens of mS.

Three main exceptions not indicated correctly were a 30A TRIAC, a UHF/SHF high power bipolar transistor and an LM317 voltage regulator. In the case of the TRIAC, the tester couldn't supply enough holding current to keep the device switched on once it triggered. A subsequent test using a bench power supply showed it needed about 30mA minimum to hold it on, while the DCA Pro delivers 10mA maximum. The RF bipolar transistor failed to indicate correctly as it started oscillating at some bias levels! The long connection leads had enough stray inductance and capacitance to cause it to go unstable. The LM317 was labelled as a diode as the absence of a ground on this device does not permit the normal test process to work. However, both an LM7805 voltage regulator and a two-terminal 2.5V reference were identified perfectly.

In each case the display for the exceptions showed as *Faulty or Disconnected Component*. The manual does warn about all these types of device as being potentially troublesome. I did also try a 2N2646 unijunction transistor – which is a component type that is not supported. It just showed as a faulty component.

COMPUTER OPERATION. Now, this was the bit that really interested me. First of all you have to install the software (supplied on the memory stick). Any operating system of Windows XP or later is suitable and precise installation details are given both in the manual and on the additional sheet of paper. Plug in the USB stick and run the setup program, which guides you through the installation process. The operating software uses the Microsoft .NET framework, which is also included on the memory stick – note that the installation of this part can seem to (and actually does!) take an extraordinarily long time to install. The manual warns that it may take up to ten minutes. In fact on my 2007 vintage Dell desktop (Windows XP operating system) it took about seven minutes; on a Win XP Dell laptop of a similar age it appeared to take even longer than 10 minutes, although I was busy doing other things while it all happened. The installation process went smoothly and seamlessly. Towards the end, when instructed, the DCA Pro has to be connected to the PC's USB port. Once installation is complete, the unit bleeps and can be operated straight away.

For normal computer operation, the unit is up and running as soon as the USB cable is connected and the software started; there is no need to operate the ON pushbutton. If a component is already connected to the test leads, a screen similar to Figure 1 appears. The left hand pane shows the text that appears in the LCD in its entirety, the right hand pane showing guidelines and notes specific to the device being tested. Clicking the 'Test' button repeats the test.

CURVE TRACING. The tabs above the 'Test' button allow DC operating curves to be generated with a number of plot types on offer depending on the component type in place. Click the appropriate tab for a particular plot type; a default set of starting points and numbers are offered as shown in Figure 2. Accept these for now and click the start button. The measurement starts and the curves grow. These are plotted in real time, with the scale ranges adjusting automatically to match the values being measured. A set of plots such as those shown will be generated. A 2N7000 MOSFET was used for the plots illustrated here. For many types of transistor, just after the plotting process starts the initial curves may appear a bit noisy with random jitter, but as the test current for subsequent curves increases, and the scale changes, those original noisy plots disappear closer to the axis, showing they are insignificant compared with the normal operating ranges of currents. Depending on the number of curves selected for any plot, the process can take from several to tens of seconds as the traces grow and resize continually.

Depending on the type of device under test, other plot types may be available. For FETs, drain current versus gate volts for a range of drain voltages can also be plotted, as shown in Figure 3.

The plot can be saved to the Windows clipboard for pasting into any other software that accepts graphic dumps. To do this, right click on the graphics window and use the 'Copy Image' function, then paste the result into a suitable graphics or drawing package. All popular software packages appear to work, including Microsoft *Word* and *PowerPoint*. Data can also be saved to the

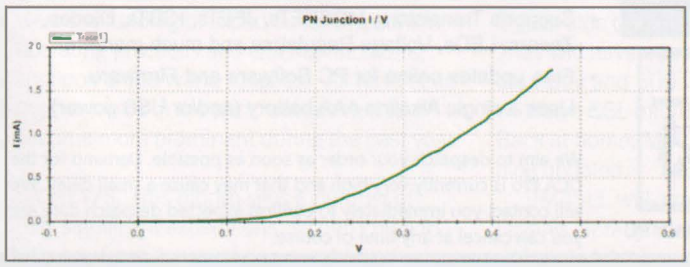


FIGURE 5: Curves for a germanium diode.

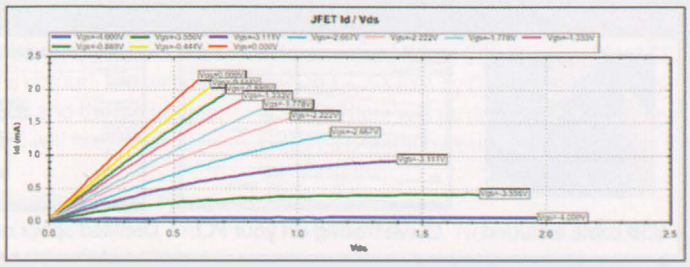


FIGURE 6: Set of Id/Vds curves for a 2N3820 P-Channel FET (see text).

clipboard using the 'Copy Data' option. Every test point forming the plot is saved in comma separated variables (CSV) format for pasting directly into a spreadsheet. As every data point from the plot is included, this process allows much more detailed analysis off-line, using spreadsheet analysis and plotting tools.

Figures 4 and **5** show curves for a medium power bipolar transistor and germanium diode respectively, generated using the image capture facility.

The PC interface also allows you to setup a few of the instruments settings, namely the LCD contrast and the bleep on/off. Firmware upgrades (from the manufacturer's website) can be made using this software and interface. This process can be performed automatically if the PC is connected to the internet.

The manual (also available on the memory stick as a .PDF file) has appendices covering the testing and curve tracing procedures and test circuits. It goes into considerable detail of how the instrument performs these and the limitations in the ranges of values possible for the tests.

A PRACTICAL TEST. The 2N3820 P channel FET was to hand at the start because I had been looking at using this as a voltage variable resistor in an audio gain stage to give an automatic gain control for a simple SDR. J-FETs can be operated as variable resistors, using the gate voltage to vary the value of effective resistance between the source and drain terminals. Being a P channel FET, a positive gate voltage is convenient for applications where no negative rail is available. However, J-FETs are not really specified for this type of operation and the Vg / Rds characteristic is entirely unpredictable from batch to batch – and even within devices from the same batch. So here was an opportunity to accurately map out a device.

Figure 6 shows a set of Id / Vds curves for an extended set of gate voltages. The slope of each plotted line close to the origin is the effective resistance whose value is calculated from Vds divided by Id. By determining the slope from the plots, a range of Rds values for each gate voltage can be generated. The example shown suggests about 280Ω at Vg = 0V, 590Ω at Vg = 2.2V, to about 1kΩ at Vg = 3.1V and rapidly rising to infinite at 4V. The linearity of the line close to the origin suggests is will make a good distortion-free variable resistor for audio levels up to about 0.5V pk-pk.

With exported values pasted into a spreadsheet, the calculations can be automated and the result used to generate plots that the instrument does not do itself. In this case a plot of Rds versus gate voltage was quickly generated in an *Excel* spreadsheet to show the range of AGC operation possible.

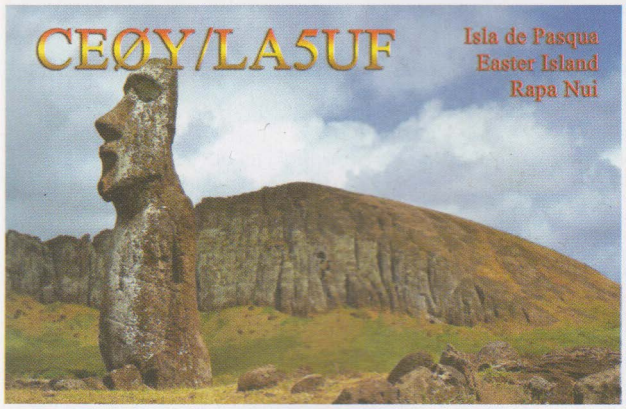
CONCLUSIONS. This is a really useful little tool that is brilliant at rapidly identifying almost anything you connect to it. In fact, using the instrument to just identify connections of an otherwise known device is probably quicker that searching out its datasheet.

But it is really in the curve plotting and parameter measurement that the DCA Pro stands out. Being able to actually characterise and properly measure the DC biassing conditions of almost any device means that tasks such as finding matched sets is made considerably easier, as is finding the best device for that unusual way-out project. This instrument shows how real semiconductors perform and gives both an invaluable handheld quick checker as well as a lab grade curve tracer. Being able to easily export an extensive measurement set for further analysis makes this little instrument even more of an invaluable asset to have around.

Thanks to Peak Electronic Design for supplying unit tested – it was almost the first one off the production line! You can find out more on their website, www.peakelec.co.uk.

HF

News of some UK-led expeditions and a round up of 2012 activity



Easter Island will be activated this month by a UK team.

NOT A BAD START. The year seems to have got off to a reasonable start in terms of propagation, with G3WGV's UK CW Table showing that G3TBK had 172 DXCC entities worked on the mode by 27 January, including 83 on 12m and 54 on 10m. On Top Band, G3BJ, operating as G5W in the CQWW 160 CW Contest, worked the following non-European countries over the contest weekend: XE, PY, CE, HK, HC, KP2, FM, V3, PJ2, P4, 6Y, D44, EA8, 3V8, CT3, EA9, 4X, 5B, A65, HZ, ZL, TA2, HS, JA, VK6, A9, UN, 4L, EY and UA9.

W1JR END OF YEAR REVIEW. As for 2012, we now have W1JR's usual excellent summary (sent out to Daily DX and Weekly DX subscribers). It runs to seven pages in all, so this summary cannot begin to do it justice. Joe reports that around 290 entities were activated during the year (including at least 270 on CW) with 25 large-scale expeditions, although only 7O6T activated a 'top ten' wanted entity. Several expected expeditions were delayed while a few had to be cancelled for logistical reasons or were curtailed due to bad weather and other problems.

I would add to the above that there appeared to be three major topics of conversation during 2012 as far as DXpedition activity was concerned. These were the funding of expeditions, DXpedition operating practices and QSLing (including Logbook of the World uploads). All have been regular topics in the past, but seemed to become more prominent during the past year.

DX NEWS. This month sees a number of very significant expeditions, so don't plan to be away from the shack too much! First off is Clipperton Island. Cordell Expeditions is behind this one, which will have 24 operators, with as many as eight stations on all bands and modes, and DXA, a satellite link system with near real time log updating. The callsign will be TX5K and dates are 28 February to 10 March. QSL via N2OO. Cordell Expeditions is also behind a scheme to activate Heard Island in 2014, with planning already well under way. More on this in due course.

A UK-led expedition to Easter Island is scheduled for 20 to 27 March, with activity planned mostly on CW on 160 through 10. Plans are to use Elecraft K3s, small amplifiers and vertical antennas with plans "to work challenging paths on the low bands, with emphasis on Europe". For receive antennas on the low bands they will use a Beverage or flag, depencing on available space. Plans are to upload daily to *Club Log* and LoTW. Team members include G7VJR, G3TXF, G4IRN and G3ZAY. The callsign will be XR0YG. QSL via G3TXF and LoTW.

H44 (Solomons) and H40 (Temotu) are the destinations for a group of nine German and Polish operators. H44G will be activated 8 to 25 March while part of the group will operate as H40T from 12 to 23 March. They will have several stations on 160 through 10 CW and SSB. There will also be a station dedicated to RTTY, PSK31 and SSTV. QSL via DL7DF.

Chris, GM3WOJ and Keith, GM4YXI plan to sign VK9C/GM2MP (ZK2X) from the Cocos-Keeling Islands (OC-003) 30 March through to 13 April, with activity on SSB, CW and "some RTTY". They are hoping to have a real-time logging system and daily LoTW uploads.

Another Scottish team, GM0GAV, GM3POI, GM3YTS and GM4FDM will sign T2GM from the Vaiaku Lagi Hotel on the lagoon side of Tuvalu from 13 to 23 March. They will have a pair of K3 rigs, verticals near the water and 500 watts output. The website will have QSL information and the log update. Back at home, MM0NDX will keep their blog updated.

9M4SLL will again be active from Layang-Layang, Spratly Islands (IOTA AS-051), on all bands 10 through to 160m CW, SSB and RTTY from 10 to 18 March inclusive. The operators include John, 9M6XRO, Steve, 9M6DXX and Don, G3BJ. The group will use several stations with linear amplifiers to vertical antennas all within a few metres of the ocean. QSL Manager for this operation is Tim, M0URX (OQRS, direct, bureau, LoTW). Logs will be uploaded to LoTW as quickly as possible after the DXpedition.

N6MW has announced the new dates for his DXpedition to American Samoa, which was originally expected last November. They are 19 to 28 March. Plans are for activity on CW, some SSB and RTTY "if/when things slow down". The team will locate "well south of the Pago Pago harbour area to avoid mountain low angle cut off".

Ken, K4ZW, recently operated as Z81Z from Juba, South Sudan. He hoped to be back there in February. QSL via his home call. Also from South Sudan, Massimo, IZ0EGB (ex-9L1MS, EL2GB), is now living there and hopes to be on the air soon as Z81B. QSL via IZ0EGB.

N0TG, AA4VK and N1SNB plan to operate from Sint Maarten as PJ7/N0TG, PJ7/AA4VK and PJ7/N1SNB from 15 to 23 March. QSL via N0TG. PJ2/W1USN, PJ2/AA1M and PJ2/W1SSR will be on Curacao 8 to 22 March, all bands 160 through 10, SSB, CW, PSK and RTTY. QSL to their published addresses or the bureau.

Finally, March is SSB month in the sense that there is the ARRL International DX Phone Contest and the CQ WPX SSB Contest. In the former you may only work US and Canadian stations, but it's a great opportunity to catch some of the more unusual states and provinces. And there will be quite a few expeditions out for the latter contest, even though a P41 (DF7ZS is off to Aruba, for example, from 26 March to 3 April to include the contest) is probably no more rare a multiplier than an obscure US prefix like NK8, for example. That said, there is also a significant CW contest, the Commonwealth Contest, where the rest of the world become onlookers. G3TXF will be operating as ZF2XF, a team from the Addiscombe ARC as C4I (Cyprus), 9H3ET by G3LET, 5X1XA by G3XAQ and J34G by G3PJT. There will no doubt be others; check G3PJT's Commonwealth contest website for the latest list.

60 METRE NEWS. Now that many of the restrictions have been lifted on 60m operation we can expect to see greater interest from

the UK in chasing DX on the band. Some of the recent 5MHz news includes the fact that SM0TSC, has been given an experimental licence for six months. He is allowed to operate on 5310, 5320, 5380 and 5390 centre frequency plus 1.5kHz, maximum of 3kHz bandwidth and 100 watts. For skeds on any mode, e-mail him at: sm0tsc@hflink.net. Peter, OX3XR, reports that Greenland now has the use of 5250 – 5450kHz. He will soon be active using a dipole.

RECORDINGS ARCHIVE. K8CX, Tom, has 135 new DX sound clips that were recorded in the last year. This is his 15th year of running this site. Also included on the site are some recordings as far back as the 1960s. He continues to solicit on-air recordings in any format, to be added. Contact K8CX if you have any old tapes of 'good stuff' lying around!

INFORMATION SOURCES. It's some time since I mentioned the main sources to which I refer when I am preparing this column (other than direct input from readers and others). My mainstay for many years now has been W3UR's excellent Daily DX, an e-mail newsletter available on subscription. In addition there are two free weekly newsletters that I can wholeheartedly recommend, OPDX News by KB8NW and 425 DX News by Mauro I1JQJ and Valeria IK1ADH. The latter also produce an illustrated monthly digest with a lot of stories and pictures from recent expeditions, downloadable from the 425 website. Last, but by no means least, I increasingly find myself referring to Col, MM0NDX's DX World website; Col really does seem to have his finger on the pulse of what is happening in the world of DX. For QSL information, my main sources are qrz.com and the IK3QAR website. Many of the questions that I see on the various club reflectors that I frequent ("when is the xxx expedition due to finish?" "Do the xxx team have online logs?" and so on) could be answered easily by reference to one or other of the preceding publications.

COUNTRIES WORKED, 2012
(starting 1/1/12, final totals)

Call	CW	SSB	Data	All
G4CCZ	246	152	103	264
M0VKY	182	203	0	251
G3XTT	245	124	56	251
G4ZOY	123	225	183	239
G3HQT	209	0	1	209
G0RPM	125	123	148	203
MU0FAL	173	128	0	187
M0BVE	178	0	0	178
G3VMY	132	60	93	148
G4DDL	143	64	60	147
G4XEX	0	116	99	141
G4FVK	74	101	0	122
G6CSY	45	27	60	69

CORRESPONDENCE. I was delighted recently to receive one of John, G3BDQ's handwritten updates on his Top Band activity. During 2012, John added some 'fractal loading' to his Top Band antenna which, he says, has improved his DX results on the band. Incidentally, John will be hitting 90 years of age around the time that this appears but still does all his own antenna work! John also uses his transmit antenna for receiving although, like many of us, he is finding that local noise sources are increasing as the years go by (plasma TVs, switch mode power supplies, low voltage lighting and dodgy thermostats seem to be the worst offenders, in my experience). This is why more and more low band DXers are turning to coaxial loops and other specialist receive antennas. John observes that few North American stations come on around our dawn, other than in contests. This is perhaps not too surprising given that it would be the early hours of the morning, on the East Coast at least. John's 160m log for the season (from October) shows A45XR, C50C, PT0S, UA8WAA, XP2I (Greenland), EL2MF, D4C, C5A, 5T0SP, HL5IVL, ZS1REC, 5N7M and HS0ZEE. This all achieved without internet or Cluster, but through listening and CQing.

Peter, G4XEX remarks, "I have been looking back over my log for this year and comparing it to a couple of years ago and the comparison shows that conditions are most certainly a lot better, they are just not as good as I had hoped they would be". His recent DX includes VP8LP (Falklands) on 12 SSB, A61K, A61AS, A71BO, A92GR, V25A, FG5GP, JX9JKA, VU3WII, VK3COW, VK4FXAC, VK6APZ, VK6LD, VU2RBI, XE1/DJ4EL and YB2MVD on 15 SSB, 5T0SP, OD5ZZ, V5/DJ2HD and XU1A on 17 SSB, plus V5/DJ2HD and ZR6DX on 20 datamodes.

Nigel, G0RPM reports, "My main goals for 2012 were to get my entity count up to 250 and to work DXCC on 80m. I fell 4 entities short of the first and succeeded with the second. The opposite of what I expected! I hadn't really considered 80m DXCC achievable with my antenna, which is essentially an 82ft dipole with coils on the ends to make it look electrically the right length for a dipole. However, working Brunei (V84SMD) one day changed all that! As winter approached I decided to go for it, so I spent a lot of time on the air listening, monitoring the clusters and setting up the odd sked with folk I've worked before on other bands. Finally, with just a few days to spare I got over the finishing line. Just need to chase down those QSLs now!" To give you a flavour, here are some of Nigel's contacts on 80m: V84SMD, EX2B, EK6RSC, 3V8BB, YV5JBI and 9Y/DL7VOG on RTTY, ZS1LS on JT65, A92IO, CO6LC, HR2/NP3J, 3A2MG, P3EU, HI3/M0GDX, JX9JKA and FM5WD on SSB, plus UK8AR, SX9S, 6V7V, KP2M, C5A, D4C, 9H3TX, OH0Z, HK1NA, PJ2T and C6AKQ on CW. The "best of the rest" were JT1E and VK2DX on 15 CW, YI1RZ on 15 RTTY, SV2ASP/A on 17 SSB, FR1GZ on 10 JT65, AP2IA on 40 PSK63 and AP2NK on 10m CW.

Duncan, G4ZOY writes in for the first time. He lives in the north east, running an FTdx5000 on SSB and RTTY and, to a lesser degree, CW. Most of his activity is on 10, 15 and 20m, using a TB3 triband Yagi. For 12 and 17m he uses dipoles at just 4m above ground but, nevertheless, is very happy with the results he has achieved – 113 entities on 17m and 85 on 12m, since the end of August. He worked all but one of the main expeditions that were active in 2012, most of them on multiple bands. That said, none gave him an all-time new one, so his Mixed DXCC score remains stuck at 321.

The table this month shows final scores for 2012. Congratulations to Paul, G4CCZ for a fine score; there obviously wasn't too much that he missed. Paul runs an IC-7800 and linear to a 3-element SteppIR with the 30/40m driven element add-on, plus an inverted-L for 80/160. But well done to all – some of those further down the table have much more modest stations, which makes their results equally impressive. Perhaps the biggest factor of all is being able to be in the shack at the right times – retirement has its benefits!

SILENT KEY. John Leonard Dack, W7KH (ex W7GUV), became a Silent Key on Monday 7 January. He was 91. Johnny was at the very top of the ARRL DXCC Mixed Standings with an amazing 398 countries, which included 340 current entities and 58 deleted counters. He did this with an extremely modest station on a 'small Seattle residential log'. John was first licensed in 1938 at the age of 17. He worked every DXCC country except Daman and Diu (CR8), the Portuguese enclaves on the western coast of India, French Indo-China (FI8) and Manchuria (C9). Johnny was a founding member of the Western Washington DX Club. K6ZO passed on in 2012, so that leaves 4X4DK, W2OKM and W9JUV as the reigning DXCC kings, all on 394. According to Google searches, 4X4DK is 77 years of age, W2OKM is 88 and W9JUV is 82. Hopefully, they'll all be working DX for many years to come.

WEBSEARCH
425 DX News: www.425dxn.org
Commonwealth Contest: www.beru.org.uk
DX World: dx-world.net
H40/44: www.dl7df.com/h4/index.php
IK3RAR: www.ik3qar.it/manager/
K8CX sound archive: http://hamgallery.com/dx2012/
N6MW: http://n6mw.jimdo.com/
OPDX Bulletin: http://hamnet.org/mailman/listinfo/opdx
T2GM: www.t2gm.org
TX5K: www.cordell.org/CI/index.html.

VHF/UHF

January's Quadrantids meteor shower produced several 432MHz contacts

PHOTO 1: Ice covered F9FT 70cm Yagi array belonging to WA1ZMS in Virginia. Photo: WA1ZMS.

INTRODUCTION. January was a cold month with lots of snow and some very low day time and night time temperatures. As this is being written, one long cold spell has just ended and heavy rain is in prospect. This is not the best time to be doing antenna work! **Photo 1** shows just how cold it can get in some places. This is a four times 21 element 70cm Tonna array, covered in ice. I wonder how that affected the gain?

My request for QSO reports produced a good response. The following sections show that VHF and UHF activity remains at a good level in spite of the cold and wet weather in the UK. The highlight of January was almost certainly the Quadrantids meteor shower that appeared near the beginning of the month.

QUADRANTIDS. As mentioned by Richard last month, the Quadrantids meteor shower (3 – 6 January) is one of the bigger MS (meteor showers) of the year. It was therefore interesting to receive reports on the levels of activity and results obtained during this year's event.

The Quadrantids, so called because the shower radiant is in the direction of the constellation, once called Quadrans Muralis but now called Bootes [1], is capable of matching the hourly meteor rates of some August Perseid and December Geminid showers. More than 100 meteors per hour have been observed in some years. However, the Quadrantid shower has a short peak that lasts for only a few hours. This means that the MS enthusiast has to be alert to find and use the best part of the shower. Fortunately, the Quadrantids is a particularly good shower from the point of view of trail ionisation intensity. This is as a result of the meteor particle direction favouring the time of peak arrival. QSOs have been made at least as high as 432MHz during this shower.

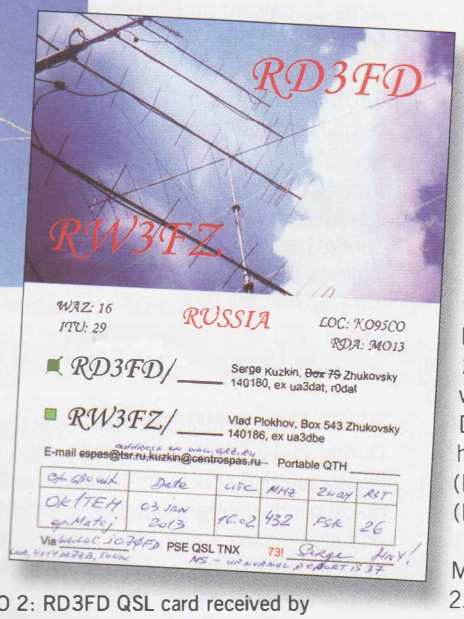


PHOTO 2: RD3FD QSL card received by OK1TEH for his 70cm MS QSO in January.

Reporting from west Wales, Geoff, GW3LEW (IO71) says he managed to repair his 70MHz PA at great expense. With the system repaired he worked SP9HWY, OK1RD (JN79), OZ3ZW (JO54) and OZ1JXY (JO46) during the peak of the Quadrantids shower. In spite of many tries with OH3DP at 2000km not even a ping was heard by either station. A test with OH8MGK at 2200km produced only a solitary ping.

Also from Wales, Lyn, GW8JLY, says MS was the only way to work any real DX on 144MHz throughout January. During the month he managed to work the five new locators JN24, JO68, KO28, KP11 and KP21, all completed during the Quadrantids meteor shower between 1 and 4 January. He was particularly pleased to work OH3AWW (KP11) and OH6MAZ (KP21) as both these locators are rarely available on MS. In total 31 QSOs were completed during the shower with many of these just under 2000km and with three QSOs over the 2000km barrier.

G4BAO reported working SP2HMR (JO940) at 1231km during the Quadrantids, using FSK441 on 50MHz. Going back to 13 December, 50MHz MS stations worked by John were SP9HWY (JO90) at 1329km, IS0AWZ (JM49) at 1599km, EA5TT (IM99) at 1423km, IK7YJY (JN57) at 969km and IZ3KSO (JN55) at 1109km.

Whilst up on 70MHz, G4ZTR says that apparently Hungarian amateurs are back on the band from 30 December 2012. As a result John managed to work HA1YA (JN87) via MS on 31 December. During the Quadrantids he worked SM3PXO (JP73), LY2BUU (KO15), with his best DX UT2UB (KO40) at 2005km.

Yet another John(!), our new VHF Manager, G4SWX reported working 22 stations on 144MHz during the Quadrantids. The most notable was 9H1CG (JM75) at 2083km. John comments that 9H1CG also worked G1KAW/P and G4CDN, with the latter station being at greater distance than G4SWX.

Steve, M0BKL e-mailed that he has been busy improving his EME capabilities on 144MHz and 432MHz, so he has not done a great deal of operating. He reports that the bands have been extremely poor, for him at least. He did try a very interesting MS sked with an EA8 when there was some ducting to CT/EA from EA8. The distance is huge for MS; he did get some decodes but did not complete.

Even though 432MHz MS can be extremely difficult (harder even than EME

on this band) Matej, OK1TEH (JO70) managed three QSOs on 70cm during the Quadrantids. He worked UX0FF (KN45) at 1201km, IK0BZY (JN61) at 924km and RD3FD (KO95) at a remarkable 1701km. He also tried, unsuccessfully, with OH6KTL. The RD3FD QSL card for his QSO with OK1TEH is shown in **Photo 2.**

Matej runs an FT-847 with preamp and a GS31b amplifier at 300W out on WSJT modes to a 23 element DK7ZB design 6m boom Yagi.

Looking through the various reports of 432MHz MS it is immediately striking just how few successful contacts there have been on this band. From the OK1TEH log **[2]**, clearly the Quadrantids MS is the best opportunity to work MS on this band.

VHF/UHF EME. From John, G4ZTR, "On 2m EME I have another half dozen initials recently, with the most interesting being the most local: ON4KHG in JO10. Gaetan is only 260km away so it can be a struggle to separate the EME signal from the direct path. He runs just 300W to a pair of 9-ele Yagis, and presents a signal level just a few dB from his minimum workable with 4 x 8-ele I0JXX Yagis."

John, G4SWX, provided a copy of his logs for the December to January period. This shows 70 EME stations worked, indicating how seriously John takes his EME operation. The best DX was VK7JG (QE38) at 17194km, followed by VK5FA (PF95) at 16159km.

John worked the following "small" EME stations on 144MHz: DJ6AG (JO51) on 13 January, running a 4WL (wavelength) Yagi and 300W, E77AR JN94 on 8 January, running an 11-ele Yagi and 500W. John comments that after successes on MS many people like Zdravko have recently starting to give EME a try. Another small EME station worked by John was YO5LD (KN17) on 2 January. Again, after having worked John on MS earlier in the evening, Dani worked him on EME soon after his moonrise. He runs a 6WL Yagi and 200W.

More typical of John's contacts were VK3GHZ (QF32) on 14 January, Rhett runs 2 x 12-ele Yagis and 400W; N1DNN (FN34) on 20 December, Bill runs 2 x 9-ele Yagis and 350W. WA4MYO (EM94) was also worked on 18 December. Sonny runs 2 x 9-ele and 300W.

IK2DDR was worked on 19 January and, during the ATP, SM2CEW (KP15), OK1MS (JO70), G4SWX (JO02), I3EVK (JN66), N4GJV (EM95), OH7HXH (KP53), SM7WSJ (JO67) and IZ2DJP (JN55).

SPORADIC-E AND TROPO. Although it is generally considered that the best Sporadic-E (Es) propagation occurs between May and July (in the northern hemisphere), there is often a second peak around mid winter. 30 December seems to have seen the peak of the 2012/2013 winter with most QSOs occurring between about 1330 and 2200UTC. Dave, G7RAU (IO90) kindly allowed me to use his LiveMUF map **[3]** shown in **Figure 1** to illustrate the extent of the Es on the bands above 30MHz between 1700 and 2200UTC.

Dave worked LZ1ZP (KN22) at 1940 on 50MHz at a distance of 2193km, whilst LZ1ZP went on to work PA5WT (JO22) several minutes later, followed by DH4FAJ (JN49), DF5HC (JN49), G3XGS (JO01) and F4AZF (JN39). UK stations listed were G7RAU, GM4UYE (IO86), GM4ZMK (IO75), G0LFF (IO90), G3XGS, M1SLH (IO91), G3VYF (JO01), G0LGS (IO81), GW8ASD (IO83), G0OPH (IO94) G3MBN (IO81) and M0CGL (JO03). The spread of locators within the UK shows how widespread the Es opening was.

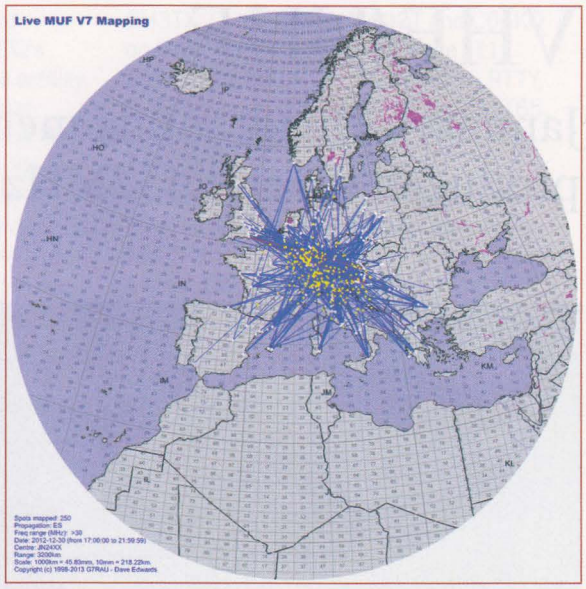


FIGURE 1: Live MUF map from G7RAU showing the concentration of Es signals on (mainly) 50MHz on the evening of the 30th December 2012 over a 5 hour period.

Dave also mentioned that there was some Es present on 50MHz on 30 December in the afternoon / evening and at 2030UTC, for 30 minutes, the beacon 9A0BFH (JN85) on 70.0234MHz was being heard but there was no activity on 70MHz.

GW8JLY says there was no significant 144MHz tropo (tropospheric scatter) at all during January. A few minor enhancements allowed some QSOs with nearer Europe but just PA, ON, F and DL were worked with a QSO with DK3EE (JO41) at 813km providing his tropo ODX of the month.

NEWS AND COMMENT. New Spectrum? During 2012 Ofcom consulted on the release of VHF spectrum. Initially the RSGB made submissions about 146 – 148MHz and also placed a marker to express interest in 70.5 – 71.0MHz and 80.0 – 81.0MHz, as discussed at the Spectrum Forum in November 2012. VHF also features in the RSGB plan for 2013, which includes an aim to 'Deliver additional VHF spectrum along with innovative usage'.

At the recent January Ofcom-RSGB forum meeting, the RSGB clarified its interest in the 70/80MHz area whilst Ofcom presented data on spectrum occupancy within the 144 – 146MHz band. It will be interesting to see how this develops during the year.

DUBUS Technik 12. I was recently sent a copy of the latest *DUBUS Technik 12* handbook. This issue includes a selection of technical reports from the *DUBUS* quarterly magazine covering 2011 and 2012.

I have taken *DUBUS* from 1978 to the present without a break and, without doubt, find this dual language (German and English) VHF / UHF and microwave magazine the very best place to keep up with the latest developments and thinking in amateur radio technology and propagation.

Of particular note in this latest issue is a re-print of the article by F5FLN, describing his 432MHz 1kW solid state amplifier. Bearing in mind the reports on 432MHz MS above, this is possibly the ideal power amplifier to use to exploit the difficult 70cm MS mode, in regions where such power is permitted.

Also in *Technik 12* are three reprints on high dynamic range low noise preamplifiers, which increasingly are needed to cope with the ever-encroaching digital TV, mobile radio and broadcast signals on our VHF and UHF bands.

The three reports on the development and real world replication of modern Yagi antennas by our own G0KSC are required reading for VHF antenna enthusiasts (aren't we all?).

DUBUS Technik 12 is available in the UK from GM4PMK, QTHR.

SIGN OFF AND HAND OVER. Next month Richard, G4HGI, will be taking over the VHF/UHF column on a more permanent basis. I wish Richard all success in his new column and to thank everyone who has sent me reports.

WEBSEARCH

[1] Quadrantids: http://tinyurl.com/rc0313vu1 or www.google.co.uk/search?q=quadrantids+meteor+shower+2013&hl=en&tbo=u&tbm=isch&source=univ&sa=X&ei=cjYEUYqwMMOJ0AW9nIHoCA&ved=0CEoQsAQ&biw=1366&bih=568

[2] OK1TEH: http://ok1teh.nagano.cz/ms_70cmlog.htm

[3] G7RAU Live MUF: http://tinyurl.com/rc0313vu3 or http://g7rau.demon.co.uk/default.aspx?menu=5000&LOGINID=a&LOGINKEY=a

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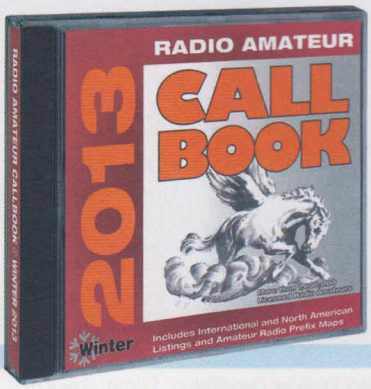

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GHz Bands

Another first on 24GHz EME and a new Spanish 10GHz beacon

PHOTO 1: The Heelweg Microwave meeting. Photo: G4DDK.

HEELWEG MICROWAVE 2013 REPORT. The Annual PA Microwaves get together took place in January at the Café Vos in Westendorp near the Dutch-German border. This year, I braved the snow and ice with G4DDK and G4HUP via the Harwich-Hook ferry. Sam checked with professional meteorologist and TV weatherman, Jim Bacon, G3YLA, on the snow situation before we set off. Jim's response was typically laconic: "I'm sure you'll manage OK; rufty-tufty microwavers don't get put off by a little snow." So true; all those exposed mountain tops you /P enthusiasts brave! The meeting was, as usual, an excellent affair, the only other 'Brit' to brave the weather was Kevin, G3AAF, but we were given the usual friendly welcome by the Dutch and other participants, including the excellent Chinese buffet meal afterwards. **Photo 1** shows the test equipment facilities at Heelweg, which are always second to none and the activity centred on this, but there were plenty of microwave parts traders available for that rare connector.

The following day we drove up to the north to meet Jan, PA3FXB again and visit the recently-renovated PI9CAM 'big dish' (**Photo 2**) at Dwingeloo, run by CAMRAS [1]. This Dutch national monument is where the structure of the galaxy was first examined, based on hydrogen line measurements at 1420MHz, also where Jan Hendrik Oort did much of his pioneering work. His name is borne by the Oort Cloud, a spherical cloud of predominantly icy objects that may extend up to a light year from the Sun and is the source of some comets. Interestingly, the concrete footings of the dish contain a small vial containing some of the ashes of Grote Reber, W9GFZ, one of the founding fathers of radio astronomy. Those of you who were fortunate to be at PA3FXB's talk and watched the video at EME2012 will know that an incredible amount of work has already been done by the team. The dish and equipment cabin have been removed, repaired and repainted and the dish is back on its mounts awaiting the replacement of the feed system. It is hoped that PI9CAM will be QRV from the 25m Dwingeloo dish on VHF and microwave EME again in the spring. Despite the freezing cold and biting wind (**Photo 3**) it was a truly fascinating trip.

ACTIVITY NEWS. Conditions were poor for the UK over the Christmas period and general activity was very low, with just a handful of DX QSOs reported on the cluster. There was some 1.3GHz tropo between southern Spain and the Canary Islands on 22 December. Stations in the SW of the UK reported hearing the HB9EME beacon on 6 January. Conditions were no better on the higher bands, with only F2CT and F5BUU in JN03 reporting QSOs over 600km on 10GHz. Gus, G3ZEZ (JO01nt) e-mailed me just before Christmas with a photo showing his antenna system on a home made tilt over tower (**Photo 4**) He has fully rotatable 144, 432, 1296, 2320MHz and 24GHz antennas and, mounted on the outrigger with limited rotation from NW to SE, he has 5.7 and 3.4GHz. The antennas for 1.3, 2.3 and 24GHz are home made. On the secondary mast fixed to the house are 144, 70 and 50MHz, plus 10GHz. Transverters for all the microwave bands are either home built or modified ex-commercial gear. I was prompted to try a QSO on 10 and 24GHz, so on 7 January we exchanged 569/419 on 10GHz CW over the 81km obstructed path from Clacton to Waterbeach, Gus being much stronger with me than I was with him. We then tried 24GHz but nothing was heard either way. The snow in the East on 14 January brought some 10GHz snow scatter around lunchtime but only the GB3LEX (IO92iq) and GB3MHX (JO02pb) beacons were heard here in JO02cg.

EME NEWS. On 2 January at 1430, JA6CZD and W5LUA made contact on 24GHz EME, a first between W and JA. The QSO had about an hour of common window and each had 15 to 20 degrees of elevation. JA6CZD uses a 2.4m offset fed dish with a 22 watt SSPA. W5LUA uses a 2.4m offset fed dish and a TWT mounted on the feed support providing 100 watts at the feed. JA6CZD copied W5LUA at 559, who returned 449. Both stations run linear polarisation W2IMU feeds and had to compensate for the 70 degrees of spatial offset between locations. Noise figure at both stations was less than 2dB. W5LUA was GPS locked and JA6CZD uses an OCXO and

PHOTO 2: The CAMRAS Dish at Dwingeloo. Photo: G4DDK.

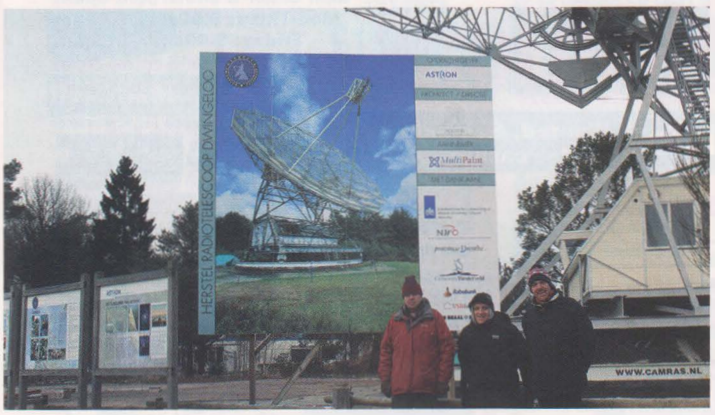

PHOTO 3: L-R G4HUP, G4BAO and PA3FXB at the Dwingeloo dish. Photo: G4DDK.

a rubidium standard to control frequency. This enabled them to deal with the many tens of kHz of Doppler involved in 24GHz EME.

EME activity here on the Fen Edge consisted of making improvements to my feed system such that I now have the dish focussed correctly, giving me at least an extra 1dB of Sun to cold sky noise. The improvement has been dramatic and I can now 'see' and (if the excess loss is not too high) hear my own echoes with my 1.9m dish and 180W. The winter weather puts many EME stations off and they keep their dishes parked, so I managed just one QSO with Jac, PA3DZL, this time on CW.

PHOTO 4: G3ZEZ's antenna system. Photo: G3ZEZ.

G100RSGB EME PLANS. The UK Microwave Group is planning to activate the RSGB centenary callsign G100RSGB on 10GHz EME on or around 18 and 19 May from the 3.7m dish at the QTH of Brian, G4NNS (IO91ff). Moon windows for those two days look like about 1600 to 2230Z on Saturday 18th and 1700-2300Z on Sunday 19th. The moon is nearer apogee than perigee so there is an additional path loss but Brian doesn't think that'll be a problem on 10GHz. As he points out, it's only another 30 or 40,000km! He may also activate 5.7GHz and 24GHz if the opportunity arises. More news next month.

BEACON NEWS. A report from Pedro, ON7WP seems to sum up the challenges faced by all beacon and repeater keepers these days. At 10.30am on 3/12/2012 all beacons at the ON0VRT site JO20cs (70, 23, 13, 9 and 6cm) as well as the co-located repeaters on 6m, 2m, and 70cm went QRT forever. These beacons were located on the towers formerly owed by public broadcaster VRT, at 117 and 230 metres AGL. As an employee, Pedro got permission to put up the systems, but the broadcasting facilities were sold a few years ago to Norkring. Sadly it's no longer possible to operate ham radio systems on broadcast sites owned by Norkring, mainly due to financial constraints and what Pedro describes as "surrealistic" insurance costs. He goes on to say that he has had enough of putting his time, energy and money in to community ham radio projects but thanks all those involved over the years who had so much fun building and using these systems. Very sad and just highlights the value of your beacon and repeater network sites. I hope this encourages us all to put our hands in our pockets to support them.

Some good beacon news comes via Ralph, G4ALY, who reports a new 10GHz beacon in Spain. Under the callsign ED1YAQ, it operates from a mountain top in the Fuentes National Park SW of Santander in northern Spain (IN73ta) and runs 10W to a 10dB slotted waveguide antenna with an omnidirectional pattern. It has a stunning takeoff, as the YouTube video of its installation [2] shows. The beacon is slightly less than 1100km from my QTH in the East of England so is within ducting range of much of south and west UK.

FREE COMPONENTS ANYONE? In an effort to encourage more home construction, the UK Microwave Group (UKuG) has reinstated its 'Chip Bank' service. The group holds a stock of SMD components that they ship free of charge to members in the EU. The catalogue is on the UKuG website [3] and members can e-mail requests for components to Mike, G3LYP. All will be subject to availability; a listing of a component on the site will not be a guarantee of availability. The service is run as a free benefit to all members in the EU and the UK Microwave Group even picks up the cost of packaging and postage! I know I'm biased, but for £6 a year plus ten issues of the e-magazine, *Scatterpoint* and free technical support from its nationwide technical support volunteers, joining the UKuG seems to be a bit of a no-brainer to me!

10GHz GaN PA DEVICES. As a footnote to last month's feature on G3WDG's work on GaN RF power devices, I found an interesting video interview [4] from last year's International Microwave Symposium (IMS) 2012, with an engineer from Cree [5] describing some real high power GaN devices for 10GHz use. The CMPA801B025F, a 25W, 8 – 11GHz GaN MMIC power amplifier looks particularly interesting, even if out of my price league! It does not yet seem to be available from the Cree outlets in the UK but if you are interested, it's worth a phone call. IMS2013 will be held in the first week of June this year [6] so it will be interesting to see how these devices and others have progressed in the last year.

With spring on the horizon, it'll soon be time to check out your antenna system to see how it's survived the winter. Do make sure that it's safe, well maintained and, more to the point, make sure that you're safe when working on it.

UPCOMING MICROWAVE EVENTS

26 Feb, 2000 – 2230	SHF UKAC (2.3 –10GHz)
3 Mar, 1000 – 1600	Low band 1.3/2.3/3.4GHz contest
19 Mar, 2000 – 2230	1.3GHz UKAC
26 Mar, 2000 – 2230	SHF UKAC (2.3 -10GHz)
6 Apr	French VHF and up meeting CJ-2013, Seigy [7]
27-28 Apr	Martlesham Microwave Roundtable and UKμG AGM [8]

WEBSEARCH

[1] C A Muller Radio Astronomy Station – www.camras.nl/index.php?lang=en
[2] New Spanish beacon – www.youtube.com/watch?v=ySkbFDjWakQ
[3] UK Microwave Group – www.microwavers.org
[4] Video about 10GHz GaN power devices – http://bit.ly/13VZeGb
[5] Cree RF – www.cree.com/rf
[6] International Microwave Symposium (IMS) 2013 – http://mwrf.com/
[7] French VHF and up meeting, CJ-2013, Seigy – http://cj.ref-union.org/
[8] Martlesham Microwave Roundtable and UKμG AGM – http://mmrt.homedns.org/

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£46.99 OR 2 SETS £78.99
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10m MAST, ONLY
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PL-259 - PL-259	4m	£24.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£16.99

DIAMOND COLLINEARS
CP-22...2M (2.7M/6.5db) £54.99
X-30...2M/70cm (1.3M-3.5/5.5db) £52.99
X-30N..."N"-Type version of above £54.99
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X-50N..."N" Type version of above £69.99
X-200N...2M/70cms..(6/8db-) 2.5M -N type £89.99
X-300N 2M/70cms (6.5/9db) 3.1M N type £94.99
X-510N 2M/70cms (8.3/11.7db) 5.2M-N-type £144.99
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DIAMOND YAGIS No tuning required
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6m/2 element No tuning required SO-239 feed £94.99

DIAMOND VSWR METER:
SX-100..(1.6-60MHz)3KW £84.99
SX-200..(1.8-200MHz)) 200W £89.99
SX-400...(140-525MHz)200W £89.99
SX-400N..."N" Type version of above £92.99
SX-600.. (1.8-525MHz) 200W £154.99
SX-600N.."N" Type version of above £169.99
SX-1100.. (1.8-1300MHz-with gaps) 200W £219.99

DUPLEXERS & TRIPLEXERS
MX-2000 50/144/430MHz Triplexer £84.99
TSA-6011 144/430/1200MHz Triplexer £84.99
MX-72 144/430MHz £39.99
MX-72 "N" 144/430 ..... £42.99
MX-62M (1.8-56MHz + 76-470MHz) £79.99
MX-610 1.8-30MHz + 49-470MHz (S-239 conn's) £99.99

Q-TEK COLLINEARS (VHF/UHF) Del £10.00
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PL-627 6m/2m/70cm (1.7m) PL-259 ..... £44.99

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Hard drawn (50m roll) ..... £29.99 P&P £7.50
Enamelled copper wire (50m x 16 guage) ..... £24.99 P&P £7.50
Flexweave (H/duty 50m) ..... £44.99 P&P £7.50
Flexweave (H/duty 18m) ..... £21.99 P&P £7.50
Flexweave (PVC coated 18m) ..... £24.99 P&P £7.50
Flexweave (PVC coated 50m) ..... £59.99 P&P £7.50
Special 200mtr roll PVC coated flexweave ..... £180.00 P&P £10.00
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Copper plated earth rod (4ft) as above + wire ..... £29.99 P&P £8.00
New RF grounding wire (18m pack) PVC coated ..... £24.99 P&P £5

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RG-58 Military spec x 100m. **£49.99** or 2 for £90.00
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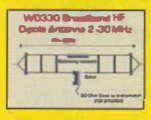
D-308B DELUXE DESK MIC

(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£24.99 each). Replacement foam windshield £3.00 + P&P.
8-pin modular plug converting to 8-pin round Yaesu adapter £24.99
£99.99

NEW DIAMOND WD-330



Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else. Japanees quality made product
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RS-102 1.8-150MHz (200W) ..... £59.95 P&P £6.50
RS-402 125-525MHz (200W) ..... £59.95 P&P £6.50
TM-3000 1.8-60MHz (3kW) incls mod meter ..... £69.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR ..... £34.99 P&P £5
DL-30 diamond dummy load (100W max) ..... £29.99 P&P £5

GENUINE COAX SWITCHES (P&P £6.00)

2 way CX-201 (0-1GHz) SO239 ..... £26.99
2 way CX-201 'N' (0-1GHz) 'N' £32.99
4 way CX-401 (0-500MHz) SO239 ..... £79.95
4 way CX-401 'N' (0-500MHz) 'N' £89.95

YAESU REPLACEMENT MICS
MH-IC8 8 pin Yaesu mic (8-pin round) ..... £44.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) ..... £39.99 P&P £5
MH-31A8J 8 pin modular ..... £39.99 P&P £5
MH-48 A6J 8-pin modular (DTMF) ..... £59.99 P&P £5

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DC-3 Fits Yaesu FT-7800/8800/8900, etc ..... £17.50 P&P £4
DC-4 Fits new Yaesu FT-950/450, etc ..... £22.99 P&P £4

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YAESU FT-DX3000

New 100 watt HF + 6m. £2399
FT-DX3000 plus SP-2000 speaker ... £2499

YAESU FT-2000

100W.....£2149.99
200W.....£2799.99
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DMU-2000 DATA UNIT .....SALE £1079.99

FT-950
HF + 6m IF DSP

SALE PRICE £1249.99
FT-950 + Yaesu FP-1030 £1399.99
FT-950 + MS-1228 ..... £1309.99

NEW FT-450D

This is the latest IF DSP marvel from Yaesu. HF + 6m (500/300 CW filters as standard). New design + ATU.
SALE PRICE £819.99
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Includes DSP

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OR WITH MD-100 £889.00

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HF + 6m + 2m + 70cm.
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OR WITH MD-100 £785.00

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HF + 6m + 2m + 70cms. Incl's battery/charger + antennas. OUR PRICE £525.00
Optional case £22.00
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FT-450

Amazing Rx front end performance. (IF DSP). HF + 6m (100W).
Last few £639.99
FT-450AT .....last one £699.99
One customer claimed, "this is the best kept secret of the communications industry".

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Broadcast quality dynamic mic. It sounds & looks superb. Fits 8-pin round & 8-pin modular radios. (Optional 6-pin modular adapter £19.99)
SALE £219.99
Yaesu MD-100A8X.....sale £119.99

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Military spec mobile antenna – superbly made. Covers HF + 6m + 2m + 70cm. *Fully automatic. (*certain Yaesu radios).
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HF + 6m
Superb DSP Rx £1265

TS-2000e	£1469
TS-2000X	£1699
TS-480SAT	£765
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ICOM IC-7600

HF + 6m in stock.
SALE PRICE £2899.99

IC-7000 (HF/6/2/70)	sale £1119.00
IC-7410 (HF + 6m)	£1695.00
IC-9100 (HF-6/2/70)	£2795.00
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FREE POST ON ALL LOG

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AT-200 PRO II 1.8-54MHz/250W/10W	£209.99
AT-1000 PRO (1.8-54MHz) 1Kw	£499.99
AT-897 plus bolt-on ATU-897	£179.95
YT-100 ATU for 857/897	£177.95
Z-817 ATU for FT-817	£119.95
Z-100 plus ATU FT-817	£134.95
Z-11 PRO II (1.8-54MHz) 125W	£159.95
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VHF/UHF TX

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2m, 70cm + APRS/TNC True dual bander
£439.99

YAESU FTM-350 E

2m/70cm + APRS. Free GPS ant + DTMF mic.
Wideband Rx + free GPS antenna
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10/6/2/70. Incls DTMF remote mic.
Incl's wideband receive
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50W, 2m, 70cm dual Rx. Built-in "Echolink" facility & more.
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Incls: Wide Rx + DTMF mic
£229.99

YAESU FT-2900 R/E
THE GOLIATH OF MOBILES

2m FM (75W). (Incl's free remote control DTMF mic)
£139.99

KENWOOD TH-D72

2m/70cm + APRS. Incl's battery, charger, PC lead + wide Rx. FREE MIC
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YAESU VX-8DE

6m+ 2m + 70cm APRS.
SALE £365.00
Add extra batt'y £379.00

YAESU VX-8E

6m/2m/70cm. "APRS" with Rx:- 0.5-1GHz. Incl's battery & chgr.
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ALINCO G-7E

2m/70cm/23cm + wide Rx. OPTIONAL SPEAKER MIC £29.99
SALE PRICE £289.99

YAESU VX-3

Micro 2/70cm + wide Rx. Incl's battery/ charger.
SALE £159.99

YAESU FT-60

2m + 70cm + wideband Rx. Includes battery/ charger. ~~£179.99~~
£129.99

PSUs

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear.
Dim'ns: 256(W) x 135(H) x 280(D)mm.
A truly professionally made unit built to outlast most PSUs.
30 AMP/12 VOLT PSU
TRUE 'LINEAR' PSU
OUR PRICE £199.99

MS-1228

28A at 13.8V yet under 2kgs. (H 57mm, W 174mm, D 200mm approx). Fully voltage protected. Cigar socket & extra sockets at front/rear. Ultra slim.
£89.99

WATSON PSU


Power-Mite NF 22amp	£79.95
Power max (25A)	£89.95
Power max (45)	£129.99
Power max (65)	£229.99
W-5A 5A (7A max) linear	£36.99
W-10A 25A (10A linear)	£59.95
W-25AM (25A linear)	£119.99

DIAMOND GSV-3000

"Linear power supply". 30A @ 13.8V. 1-15V variable. Diamond quality PSU.
SALE PRICE £159.99

YAESU FP-1030

30 amp, 12 volt linear power unit.
£159.99

DIAMOND GZV-4000

40AMP/13.8V P.S.U.
SALE PRICE £159.99
Includes built-in extention speaker

DIAMOND GZX-2500

25AMP/12V P.S.U.
SALE PRICE £99.99
Includes built-in extention speaker

ACCS

WONDER WAND

1.8-450MHz BNC. Whip supplied. Ideal for FT-817. Optional desk stand + 5m patch £29.99
£129.99

MFJ-969

Rollercoaster heavy duty ATU 1.8-60MHz (300 watt).
£209.99

MFJ-993B INTELLITUNER

Easy to use ATU.
Fully automatic (1.8-30MHz). 300W SSB.
SALE £244.99

MFJ-269 ANALYSER

1.8-170MHz + 70cm
SALE £335.00
Case 259B £29.99 Dip Coils 259/269 £29.99

MFJ-259B ANALYSER

1.8-170MHz
£259.99
Case 269B £29.99

MFJ-269 pro version	sale £359.99
MFJ-260C 300W dummy load	£49.99
MFJ-901B ATU	£109.99
MFJ-949 1.8-30MHz (300 watts)	£179.99
MFJ-9620 1.5kW (metered) antenna tuner	sale £269.99
MFJ-994B (600W) intelli tuner	sale £289.99

SGC SALE


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

ANTENNAS

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11 band (80-10 6/2/70cm). PL-259 fitting. Collapses to 95cm (~ 3 ft).
£39.99 (2 for £70.00)

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12 band (80-10/6/2). PL-259 fitting. Includes WARC bands. Our best selling HF mobile.
£59.99 (2 for £89.99)

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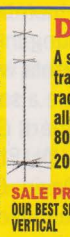
MA5B Mini beam 10/12/15/17/20m	£499.99
A3S 3 ele yagi (10-20m)	£575.99
A4S 4 ele yagi (10 - 20m)	£649.99
R-8E 40 - 6m verticle	£499.99

Standard & Deluxe G5RV

Half size 40-10m	£32.99
Full size 80-10m	£36.99
Half size Deluxe	£44.99
Full size Deluxe	£59.99
In-line choke balun for G5RV, etc	£39.99
Replacement dipole centres	£9.99

DIAMOND CP-6

A superb (diamond quality) 6 band trap vertical antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m (15ft tall).
SALE PRICE OUR BEST SELLING VERTICAL £329.99
SEND SAE FOR DATA SHEET

YAESU G-450C


Heavy duty rotator for HF beams, etc. Supplied with circular display control box.
SALE £329.99 or £389.99 with 25m cable/plugs
G-650C extra heavy duty rotator.....£379.99 or £429.99 with cable
G-1000DXC extra heavy duty rotator.....£479.99 or £539.99 with cable
GS-065 thrust bearing £59.99
GC-038 lower mast clamps £35.99
Rotator cable & plugs:- 40m £94.99 20m £69.99

GIZMOS

NEW SANGEAN ATS-909X

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

ETÓN G3

A superb small-pocket size portable.
6" x 4" x 1". 0.15-30MHz + 118-137 (AM, FM, USB, LSB).
£99.99 post £6.00

QS-200

A superb, no mess, quick fit in-car holder (fits airvent) for hand-helds.
£8.99 or 2 for £15.00 P&P £4

QS-300

A fully adjustable deluxe desktop stand for hand-helds. Includes BNC to SO-239 lead.
£24.99 P&P £5 (2 for £39.99 P&P £6)

YAESU FT-270

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

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


NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/ Phone etc.
Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.
2 for £16.99 / 5 for £36.99 (P&P £5.00)
6mm SNAP FERRITES NOW IN STOCK. 2 for £14.99, 5 for £30. P&P £5.00

AR-303

Quality rotator for VHF/UHF. Superb for most VHF-UHF Yagis, 3-core cable required. 3-core cable £1 per mtr. GS-050 stay bearing £39.99.
2" to 1.5" pole convertor..... £26.99
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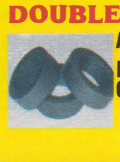
AR-303 £99.99

LDG FT METER

External analouge meter for Yaesu FT-857/FT-897 (includes connection lead).
£44.99 (Post £5)

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £16.99 P&P £5.00
12 for £26.99 P&P £5.00
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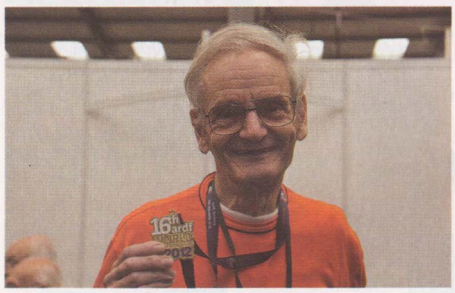
YouKits FREE POST

FG-01 Analyser 1.8-60MHz
£225.00


HB-1B-Mk3
80-40, 30-20m 4-band QRP rig.
£249.99

Committee Reports for the 2013 AGM

What work RSGB volunteers have undertaken in 2012



The UK's first medal winner, Bob Titterington, G3ORY.

ARDF.

The Amateur Radio Direction Finding (ARDF) Committee is a group of committed volunteers who have been driving forward the development of this aspect of 'Sport Radio' in the UK.

The highlight of the year was the success of the RSGB team at the 16th World ARDF Championships, which were held at Kopaonik, Serbia in September. A team of 9 competitors travelled out there, all at their own expense. We had a full team in the M40, M50 and M70 classes and were also represented in M60 and W50.

With four team members moving up to the next age group, where they would be the youngest in their new class, there were high hopes of one of them gaining a podium place. After near 'misses' on days one and two, the surprise result on day three in the 80m Classic race was a gold medal for Bob Titterington, G3ORY in the M70 class. Not only was this the first time an RSGB Member has made it to the podium but the National Anthem was played for the first time at an ARDF World Championships. It marked a significant milestone for the RSGB in the development of ARDF in the UK using the IARU rules.

The biggest disappointment of the year was the failure of the ARDF Committee initiative to attract the children and grandchildren of radio amateurs into the hobby through ARDF. Five ARDF enthusiasts were prepared to give up a day of their time to implement all of this. In the event only two young people signed up, despite an article in *RadCom* promoting the event, having the Regional Managers for both London and the South East 'on board' and e-mails to most of the clubs in those regions.

During the year the variant of the sport known as 'Sprint ARDF' has been developed further. A complete set of ten transmitters needed to stage an event using two frequencies for the hidden transmitters is now available and the first event using dual frequencies was staged in August.

A total of twelve events were staged during the year including the British ARDF Championships that were held on Cannock Chase in May.

The RSGB equipment has been loaned to a number of affiliated Societies and Scout groups during the year. This is now configured to provide four transmitters in a two minute cycle accompanied by ten receivers. A map of the area is not essential and it gives a realistic feel for the 'classic' ARDF format.

The 19th IARU Region 1 Championships will be held in Poland in September 2013 and the hope is that the RSGB will again send a strong team.

In November, the Chairman was interviewed on 'Friday Fixture', a weekly slot on Radio 2 Drive Time, which features minority sports. In the 3 minutes ARDF was described, an effort was made to convey the reasons why it attracts people and finished with a web contact and a name check for the RSGB.

Finally, I wish to acknowledge the enthusiasm and contributions of the committee members in running events and promoting the sport. In addition those who ran events without being committee members are also thanked. These were John Marriott, Stuart, G1ZAR, Michael, M6MDD, Jillian, MOJIN, Phil, MOGIE and the Oldham Club and David, G6HGE.

The committee is also grateful for the unfailing support it has received from the RSGB Board member responsible for Sport Radio, Chris Duckling, G3SVL and from *RadCom* editor Elaine Richards, G4LFM.

R G Titterington, G3ORY

AROS.

Keith Bassett, G7NBU appointed as Amateur Radio Observation Service (AROS) Coordinator and Mario Brashill, G2DPA as Deputy Coordinator in March 2012. Sadly, early in 2013, Mario, G2DPA became a Silent Key.

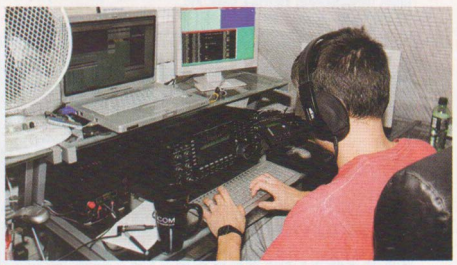
It was felt that AROS needed a more prominent profile and an explanation of its role and method of operation.

To this end the following action was taken:

- AROS leaflets designed & printed.
- AROS Observer Terms of Reference compiled and circulated.
- AROS Coordinators now included in the RSGB Spectrum forum and AROS attended RSGB Spectrum AGM as new member.
- A recruiting campaign has increased Observer numbers in UK from around 26 to currently 90.
- A working relationship established with Ofcom, ETCC, & other RSGB officers / committees.
- A designated RSGB Board member as a direct link to the RSGB Board.
- A more user friendly AROS database.
- AROS represented at the National Hamfest 2012.
- A recent full page article published in *RadCom*.

Here is a brief summary of the cases and AROS activity:

- Pirated callsigns x 4 cases.
- Pirated callsign entering contest.
- Sending offensive SSTV / *Easy Pal* images.
- Unlicensed Echolink being used on 144.650.
- 10 AROS advisory letters sent to amateurs for bad operating practices & procedures.
- Several AROS advisory e-mails sent for poor operating & the improper use of power levels.
- Fishing boats around UK waters using amateur HF bands (passed to RSGB Intruder Watch).
- Religious services heard on 40m (Passed to RSGB Intruder Watch).



AROS Observers provide monitoring when requested.

- 6 repeaters around the UK switched off for cooling off periods relating to on air abuse.
- Advice given to club on club callsign 'supervision'.
- 2 cases referred to RSGB ETCC.
- Several cases under Ofcom investigation.
- Several cases currently under review where we are considering referring the gathered information to Ofcom for their consideration of further enforcement action.

A continuing theme of the complaints received is that the vast majority of the reported nuisance activity is taking place on 2 metre repeaters and appears to be involving the same abusers on a regular basis. The reported behaviours include apparent drunkenness and foul language, abuse aimed at fellow amateurs, silent keying, jamming frequencies with music or verbal ranting. Some repeater keepers, after consultation with AROS, have turned off the repeaters for a period of time in an attempt to discourage their abuse. However, other repeater keepers appear unwilling to take any action to control the repeater activity and this may give an impression that the bad behaviour is condoned.

There are many AROS observers that have not been tasked to date but they are available to provide monitoring and other information if required. Without these valuable Observers, AROS could not function. It is the intention of the AROS Coordinators to continue to increase the number of Observers to provide an effective service to all radio amateurs across the country.

Keith Bassett, G7NBU

HF AWARDS MANAGER.

The Awards Manager is responsible for all Society involvement in the adjudication & award of the HF & VHF Award Programmes (with the specific exclusion of the IOTA Programme, which is run under separate rules and management structure). In addition to the RSGB Awards, the manager is responsible for the IARU WAC award checking and issue of the award, he further acts as a check point for ARRL WAS awards and selected CQ magazine awards. Society Members involved in award programmes with day to day enquiries or adjudication requests can contact the Awards Manager in the first instance by e-mail awards@rsgb.org.uk or by post to the address shown on both the HF awards and VHF awards web pages. Local checking and certification avoids the expense and worry associated with airmail shipment of QSL cards to overseas addresses.

A major part of activities are the direct involvement in day to day enquiries on award programmes in addition to the RSGB, IARU, CQ, and ARRL enquiries. A typical week varies from 20-30 exchanges on varied topics. Almost all are handled by e-mail with a few still using snail mail.

RSGB sponsored awards cover what can be termed lifetime achievement and take considerable skill and effort on the part of applicants over a long period of time to accumulate the necessary confirmations. Awards are represented by the Commonwealth Series that range from 100 Commonwealth Call Areas (CCC) through to the difficult 5-band 500 Call Areas using 10-80m with endorsements for WARC bands and 160m operation. The second lifetime award is based around ITU Zone Areas with similar requirements to the CCC Award but confirmation of contacts with land based stations in at least 70 of the 75 ITU Zones. Again a 5-band with WARC and 160m endorsements is available, this representing probably the most difficult operating award offered by any Society.

The most popular sponsored award is the IARU Region 1 Award for confirmation of contacts with Region 1 member countries. Available in 3 levels of achievement, it enables more modest stations to complete the award.

A special Listener Award based around ARRL DXCC is available to all short wave listeners with a starting level at 100 confirmed DXCC Entities. The current maximum is 340 Countries.

During RSGB Centenary Year 2013 we have a special (no QSL) HF and VHF programme embracing several of the RSGB awards as ingredients and added flavour using the Regional Special Activity Gx100RSGB, web pages and *Club Log*.

The most popular VHF awards supported by a regular hardcore of participants are the 6m Squares and Countries. Interest except for a few long term followers had almost gone for the 2m and 70cm band awards.

Region 1 Award continues to be the most popular with the all-time total now of almost 7000 issued. Commonwealth Series continues to attract a small band of active members who update existing claimed totals on their way to higher levels. Being lifetime it is a slow process and in the year under review with increased sunspots the higher bands have added more importance to the chase. 10m & 12m in particular have allowed some rarer Pacific Call areas to be worked.

ITU Zone Award has seen a few stalwarts adding rarer zones in Russia given the increased 10m activity. A notable achievement this year was the successful claim by Peter Hart, G3SJX for his WITUZ Supreme Level Award. This is the first ever UK claim and only #6 worldwide and to achieve this Peter had to confirm 350 ITU band zones using only 10-80m with no WARC.

A number of SWL DXLA endorsements have been issued plus two new certificates.

The IARU WAC Award is popular with UK stations and reflecting improved HF conditions a number of 5-band awards have been issued.

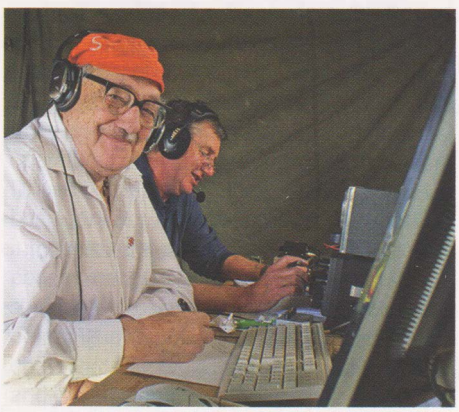
Several members claimed WAS during the year and the LoTW WAS award continues to enable members who use LoTW to claim WAS both as hybrid QSL Cards and LoTW confirmations or full 50-State LoTW confirmations. The most unusual claim was checked at Newark during the RSGB Hamfest when a visitor from Capetown hand carried his WAS QSL cards by prior arrangement rather than risk mailing them to the USA.

2012 saw the introduction of LoTW processing *CQ* magazine WPX Awards but this has proved to be a very slow process. However, given a recent upgrade to the LoTW computer, this may now clear up the extensive backlog. ARRL and *CQ* plan to add more awards via this route later in 2013.

Card checking is carried out at the RSGB Annual Convention and at the GMDX convention in Stirling.

The awards programme is detailed on the Spectrum Forum website, in regular exchanges with other awards managers, in the Awards Directory published by K1BV and full details are published in the *RSGB Yearbook*.

John Dunnington, G3LZQ



Pembrokeshire CG GW2OP/P on 70MHz. Geoff, GW3LEW and Steve, GW3VPL. Photo: Roger, G4BVY.

CONTEST COMMITTEE.

The committee has made efforts to consult contesters as part of its aim to meet their needs more closely. The Litmus Test system was used to ask for views on a proposed new set of General Rules. These rules apply to all contests, whereas specific rules cover elements such as time, date and contest exchange. Modifications and additions have been made to General Rules as a result, and this will continue.

A different consultation method has been used to solicit opinion on changed rules in

CW Field Day. Entries to all three Field Days have been falling slowly over the years – perhaps because of the rising age profile of amateurs in general. The committee asked clubs about the effect of this year's changes, and what future initiatives might increase participation. A questionnaire was prepared asking questions and with a free-form response area, and the results are being used to shape future rules.

There has been a positive reaction to both these methods of consultation and the results will be discussed with a view to continuing similar exercises in the future.

The committee has been aware that its communication to contesters needed improvement. Rather than rely on *ad hoc* announcements, a monthly newsletter has been started, where information can be published, ideas discussed and requests for input promulgated. The reaction has been very positive.

Entries in most RSGB contests have grown steadily, with club loyalty helping to increase numbers in both weekday and weekend events. The committee will try to encourage the best of these newer contesters to take part in longer and more challenging contests. This initiative will include making presentations to societies, mentoring by experienced contesters and inviting participation with existing multi-operator stations.

Efforts have been made to enable smaller groups to enter VHF Field Day, because this contest requires significantly more effort and personnel by comparison with the two HF Field Days. A new section has been created, in which entrants operate on one band at a time, with one mast to hold up to three antennas. We are hopeful of more clubs taking part, so introducing their younger members to this enjoyable form of contesting.

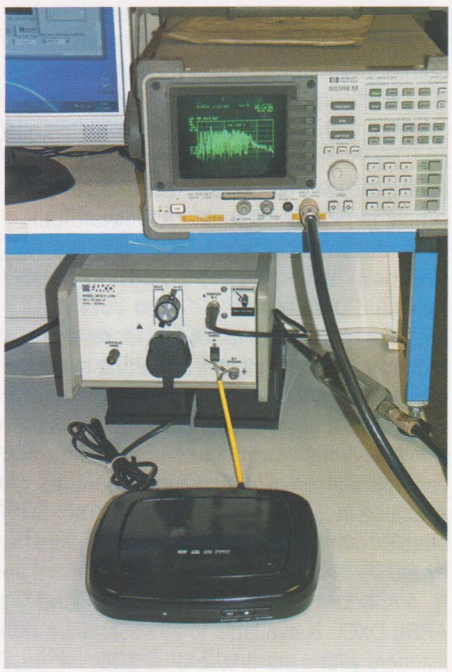
The 50MHz CW contest, last run 20 years before, was reinstated to the calendar during the summer. Many HF rigs are now available with 6m capability, so there was an enthusiastic welcome from both HF and VHF oriented contesters. Now that there are RSGB contests on 6m, 4m and 2m, a VHF CW Championship has been created, with combined scores from the three contests.

As part of the RSGB Centenary, we are re-branding our two biggest HF and VHF events – the RSGB Centenary IOTA Contest, and the RSGB Centenary VHF Field Day. The rules will remain basically unchanged, but extra awards will be available within and outside the UK, based on levels of participation, and on contacts with celebration stations.

The committee is asked from time to time whether a trophy can be donated in memory of a Silent Key. This is always welcome, with a recent new trophy being the Bill Capstick, G3JYP Memorial Award, for the winner of the 4m CW contest.

There was praise from Ofcom for the cooperation of the UK amateurs in temporarily relinquishing spectrum for use in the Olympic Games. The contest committee was able to suggest work-arounds so that events such as VHF Field Day could proceed without interference either to or from Olympic hand-helds.

Ed Taylor, GW3SQX



The EMC Committee conducted emissions tests on a DVD player.

EMC COMMITTEE.

The EMC Committee has met on a number of occasions during 2012, with Chairmanship passing from Don Beattie, G3BJ to Dr John Rogers, M0JAV.

The committee continues to deal with Members' problems of interference both to and from their stations. Recently power line telecommunications devices (PLT) has been a major issue and the committee was disheartened to find that, despite opposition from some quarters including the RSGB, the draft standard on this topic was generally supported in the vote of National Standards Committees in the second half of 2012. At the time of writing, however, it remains to be seen whether this draft will be adopted as a harmonised standard and the committee has again been in contact with the European Commission on this.

Also of concern to the committee were developments in the areas of LED lighting and solar PV panels with, in both cases, some instances of severe interference to radio reception being reported. The committee continues to monitor and assess developments here and will endeavour to ensure that common sense prevails.

The committee membership changed during 2012, with John Pink, G8MM standing down after many years – we acknowledge his contribution to the work of the committee. Joining the committee were Martin Atherton, G3ZAY, Brendan Minish, G7CUW and Peter (& Sharon) Metcalfe, G8DCZ. We welcome them and look forward to active contributions from them.

For 2013 the committee will be shaping its strategy around the following:

- Review and update EMC pages on website – self diagnosis flowcharts with spectra and sound files and updated EMC leaflets.
- Representation on relevant standards committees.
- Establish liaison meetings with Ofcom for problem tracking and enforcement.
- Recruit more Technical Advisors and improve problem recording and collation.
- Investigations of new technology and its potential impact minimisation.
- Publication of "EMC Matters" and other pertinent technical and lobbying papers.

Both to keep pace with developments and to reduce operating spend, some committee meetings are now held by e-conferencing.

Dr John Rogers, M0JAV

ETCC.

The Emerging Technology Coordination Committee (ETCC) functions to develop and enhance the UK amateur radio repeater network together with data communications systems and to promote the introduction and rollout of appropriate new technologies. Our main activities are to receive, scrutinise and advise on all proposals in respect of analogue and digital repeaters and data communications systems; to process finalised and agreed proposals onwards to Ofcom and to liaise with Ofcom and other bodies as required.

The Olympics provided us with a major challenge when we received details earlier in the year of spectrum requirements for the Games. At first glance, the demand for spectrum appeared to be overwhelming and likely to curtail amateur activity on a number of bands, especially the repeater allocations in 70cm. Working with the RSGB Olympics Team, a spectrum plan was devised that managed to avoid the main repeater block between 433 and 435MHz and that would require just a few moves and changes on 7.6MHz split allocations. It was also possible to avoid the wider 9MHz split digital repeater segments, which given the world wide connectivity available was likely to be a main area of activity for visiting amateurs.

This plan was submitted to Ofcom and, following discussion, was accepted. In more

detail the repeater changes implemented were:

- GB3OY, a new temporary repeater was licensed to provide coverage in Stratford and environs.
- GB3OK in Bromley permanently changed frequency.
- GB3NS in Banstead temporarily changed frequency.
- GB3EK in Margate reduced to very low power to avoid any possibility of interference to the London area.

In connection with the Games, two of our ETCC managers, together with a number of other amateurs, were directly involved working in various venues as part of Ofcom's Olympics Team. By all reports, the use of amateur knowledge proved invaluable in identifying and rectifying difficult interference issues. On the other hand our members came away from the Games with a greater understanding of Ofcom, so it was very much a two way street!

This year our Datacomms Manager, G8SFR, reported that he was seeing a rapid increase in proposals for digital voice gateways and recommended some changes to the 2m band plan. He produced a draft plan that was subjected to a Litmus Test via the RSGB website and produced general approval from users. One point that was noted and adopted was the possibility of interference to space operations from gateways on 145.2125MHz. Significant effort has been applied to remove gateways from this frequency wherever possible.

As in the past few years, delays with frequency clearance continued to be a major issue until the beginning of December when Ofcom were able to liaise with the Primary Users of 70cm to obtain clearance for a significant number of repeaters. Many of these applications had been outstanding for many months and in some cases years. Microwave frequencies still do present a problem and we continue to work with Ofcom and the Primary User (PU) to get a resolution for ATV repeaters in 13cm and above. Allied to this is the proposed release in 2013/2014 of some PU spectrum at 13cm. This is likely to require some changes in frequency for existing installations in that band and is being worked through with Ofcom at present.

23cm has also been a longstanding problem area and following adoption of a new band plan we have recently forwarded a trial proposal for frequency clearance. One of the main drivers behind the revised band plan was to identify spectrum for TV and voice repeaters to avoid the main aeronautical use in the band and we await the outcome of the trial with great interest.

Visitors to the ETCC website will be aware that new forms are currently being trialled. Our aim is to simplify the application process with everything now being done online. This development work has been carried out entirely in-house by our webmaster, Colin, GM8LBC and the new functionality has been used for the first time to process the recently cleared repeaters.

In keeping with Board policy, the ETCC intends to keep physical meetings to a minimum and to trial teleconferencing to reduce travelling costs.

In conclusion I would once again wish to thank all members of committee for their hard work, dedication and in giving their time freely to provide this service to the amateur community. I would also thank all users for their forbearance during another period of long delays that we hope is almost at an end. My thanks also to our colleagues in Ofcom and the Primary Users who have worked hard to get the outstanding lists cleared up and we hope will continue to do so for the remaining problem areas.

John McCullagh, GI4BWM

GB2RS.

The GB2RS news service continues to flourish, and has maintained its team of just over 100 news readers throughout the year. Each Sunday around 60 separate news readings take place. These comprise regional news readings on 80m and VHF/UHF, whilst three national readings are put out on 160, 60 and 40m.

Jeremy Boot, G4NJH continues to stream his GB2RS news reading to the internet, thus allowing voice reception of the news in most parts of the world. The script is also available every week on the RSGB website.

It was decided at the start of 2013 to discontinue taking SINPO reception reports after the 5MHz national news reading. After collecting these reports for over a complete sunspot cycle, the 5MHz database has more than enough results to enable detailed voluntary research. The Sunday news reading at 12.30pm local time on 5403.5kHz USB attracts a large number of listeners and the after-news net is very well supported.

Surveys show that the audience for GB2RS news is split more or less evenly between those who take it off the air and those who download it off the internet. Some indeed use both sources.

In September 2015 we hope to celebrate the 60th anniversary of GB2RS, and we look forward to marking the occasion appropriately.

In the meantime we thank all of our news readers and the RSGB HQ editorial team for their dedication to the GB2RS News Service.

Gordon L Adams, G3LEQ

HF MANAGER.

Two new bands were released to UK amateurs on 1 January 2013. The 472 – 479kHz amateur band was agreed at WRC12 and the band is now available in the UK. On 5MHz, there is now about 70kHz of spectrum available, a significant increase over the previous 7 spot frequencies. Access to these bands is available to Amateur (Full) Licence holders, who must obtain an NoV via an online application form on the RSGB website.

Agenda item 1.4 in WRC15 concerns the possibility of an allocation for the amateur service within the 5.25 to 5.45MHz spectrum. An International Frequency Planning Group (IFPG) meeting at Ofcom, held on 22/10/12, has placed item 1.4. on the agenda for the UK delegation. We will continue to work with the IFPG in Ofcom to maintain support for this agenda item, as well as encouraging other Region 1 societies to do the same with their regulators.

The RSGB has informal representation at ITU, ETSI, & CEPT meetings through the involvement of several members within the IARU and professional activities and we will continue to press these efforts as best we can at minimal cost to the society.

Behaviour on the HF bands continues to be a major source of concern to Members. The RSGB, in conjunction with CDXC and GMDX in the UK, continues to be a strong supporter of the DX Code of Conduct and encourages all Members and DXers to read and abide by its guidelines.

Until recently, the focus of the DX Code of Conduct has been on the behaviour of the DX chaser. Some recent high profile DXpeditions have highlighted the need to ensure that a similar expectation for operating behaviour lies in the hands of the DXpedition operators themselves. It has been very apparent that cases of deliberate interference occur much more readily with poor or inexperienced operators at the DX station, and cases of infrequently identifying, or failing to maintain control of the spread of the pile-up, is contributing to frustration and unruly behaviour. Thus the DX Code of Conduct now has a section for DXpeditions also and the RSGB is will encourage and promote adherence to the DX Code of Conduct for both DX chasers and expeditioners.

The data modes segment of the 40 metre band plan was set from 7040 - 7060kHz at Cavtat in 2009 and it has taken several years of continued pressure to encourage adherence to this plan. In particular, PSK31 activity on 7035kHz has continued. Special footnotes were added to the RSGB band plans earlier this year to encourage PSK31 operators not to operate below 7040kHz. As part of a wider IARU initiative, similar efforts have been made by other member societies.

On 30 metres, the inconsistency between

Region 1, 2 and 3 band plans in the data modes segment continues to encourage operation outside the recognised band plan, especially in Region 1. This is apparent by the increasing data mode traffic below 10.140MHz. Given that 30m often has worldwide propagation for much of the day, we will seek to better align the 30m band plan via a paper at the interim IARU Region 1 meeting in April 2013.

Remote station operation is expressly not permitted under TR61-01, the CEPT agreement that allows reciprocal operation in participating countries. At Sun City in 2011, a recommendation was passed that all societies make their Members aware that TR61-01 applies only to visiting amateurs operating in that country. There continues to be a number of cases of suspected operation of remote equipment supposedly under TR61-01. It needs to be made clear that this is in breach of licence conditions. Contest operators in the extreme category of certain contests are permitted to use remote stations, but the licensing of these stations must be in line with, and approved, by the appropriate regulator; they cannot be operated under TR61-01.

There continue to be several uncoordinated amateur beacons on 10MHz and 7MHz within Europe, in contravention of the IARU policy to discourage such beacons. In particular, a number of complaints have been received regarding beacons operating in the centre of the 30 metre data mode segment at 10.142MHz.

The issue of these beacons continues to frustrate as, although operating against IARU guidelines, they are often not in contravention of their licence conditions.

The IARU Interim Meeting Vienna C4 Committee meeting will take place in April 2013 and the RSGB will submit a number of papers on HF matters.

Ian Greenshields, G4FSU

INTRUDER WATCH.

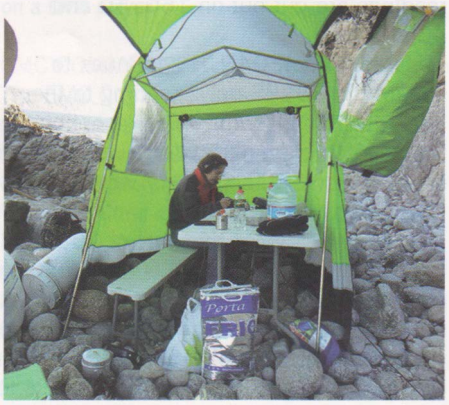
As in previous years, blatant use of our exclusive amateur bands by the Russian military has lead to the largest number of intruder reports. These tend to be data signals that are also found interfering with all categories of communications outside the amateur bands at HF. Another significant problem originating in Russia is that of CB and taxi operators using 28MHz. Assurances were received by the authorities in Russia that this problem would be attended to over a year ago but there are still many of these intruders on this band when propagation is open to Russia. The only solution seems to be to deny them the use of a quiet frequency by using it for its legal purpose in this country!

The 7MHz amateur band has had more than its share of broadcast intruders during the past year. Radio Bangladesh set up a 'test transmission' on 7105kHz but was persuaded to move when the Ofcom monitoring station at Baldock, along with a number of other administrations, complained at our request. Radio Hargeisa in Somalia has been heard on 7120kHz and do not seem to be interested in the fact that this frequency is no longer available for broadcast stations. A number of broadcasters in Africa tend to pop up in order to abuse each other for political reasons and tend not to be aware of other legitimate users of this band.

The third harmonic of Radio Tajikistan appears on 14295kHz (from 4765kHz) and a number of authorities, including Baldock, have complained, but to no avail. This has now been referred to the ITU. A legitimate broadcast transmission from Iran on 21500kHz developed a fault and a spurious signal has been heard on 21445kHz. Baldock informed them and the problem appears to have been sorted out. Observations continue.

A NATO STANAG 4285 modem paid us a visit on 14000kHz for a while but miraculously disappeared when enquiries were made in certain quarters. Nothing particularly sinister here, probably finger trouble at a transmit site!

Chris Cummings, G4BOH



CE4A operation from IOTA SA-095.

IOTA MANAGER.

In operational terms, the IOTA Programme continues to provide a major boost to on-band activity and, in so doing, provides huge enjoyment to many thousands of amateurs worldwide.

The IOTA Manager's main job during the year has been to service the IOTA community through the programme's primary tool, the IOTA website. This provides not only detailed up to date information, open to everyone, on activity and on the IOTA Programme generally, but also, following registration, an on-line password-controlled application facility for securing score credits and awards.

The year saw a rise in the number of award applications processed (+11.7%) and credits confirmed by checkpoints (+4.1%) compared with last year's figures. The figure for applications processed was the highest ever, although it may have been influenced by the announcement of increased charges from 1 January 2013!

Period	Applications	Credits Given
Jan to Dec 2008	706	45899
Jan to Dec 2009	782	55278
Jan to Dec 2010	816	59652
Jan to Dec 2011	760	52158
Jan to Dec 2012	849	54306

The overall number of participants who qualify for the annual Honour Roll by updating at least once every five years has remained constant over recent years at around 1,400. The 2012 figures suggest that the February 2013 Honour Roll outturn may be somewhat better. Given the current world economic situation this would have to be regarded as reassuring.

Calendar year 2012 saw 110 new applications for the basic IOTA award, and, overall, 518 certificates, 23 Plaques (750 Islands) and 8 Trophies (1000 Islands) issued. Comparable 2011 figures were 111 new applications and 529, 24 and 5 awards respectively.

The two year IOTA Marathon that started in January 2012 has a further year to run. It has attracted an encouraging level of take up and looks set to achieve its purpose of drawing worldwide attention to IOTA's 50th Anniversary in 2014.

Flash news, as this goes to press, beta-testing has started on new software to provide an additional route for applications/score updates on the IOTA website through submission of ADIF logs. The system will analyse the log and flag up potential IOTA counters, thus making the applicant's task of identification of suitable contacts much easier, and will then allow online submission, saving on manual data entry time. The expectation is to roll this out in the late spring.

Roger Balister, G3KMA

IOTA STEERING COMMITTEE.

In line with the wider RSGB strategic review, key personnel within the IOTA programme considered how IOTA should be developed to secure its long-term future, yet retain its high level of integrity. The programme is highly manpower intensive, dependent on a small group of dedicated volunteers so the review additionally considered its resilience and organisational structure.

The outcome of the strategic review was taken by the Board in July and the main outcome briefed to the IOTA management group in the weeks that followed. A piece on the main strategic direction was placed in the September

RadCom and a more detailed briefing given at the RSGB Convention in October.

The main strategic aim is to develop the programme's IT capability to deliver a credit submission capability so that at some future date credits for most new IOTA activations from the rarer IOTA groups can be achieved online without the need for QSL cards.

In terms of resilience, the review recognised the fact that the long-serving IOTA Manager, Roger Balister, G3KMA, who has a vast knowledge of the programme and is a principal element of the current IOTA management process, wishes to stand down in 2015.

In order to deliver these two key strategic needs it was decided, with Board approval, that the organisation of the programme should be changed. All of the day-to-day management of the IOTA programme would continue to be carried out by a new committee, called the IOTA Committee, chaired by the IOTA Manager. This would include Regional leads as well as work closely with the IOTA Checkpoints and newly created Regional Promotional Teams. The intention of this structural change would be to underpin Roger Balister in his IOTA Manager role with a view to succession.

The other organisational changes were to create a new post of IOTA IT Coordinator that would oversee IT enhancements and database management through a small IOTA IT Working Group. The main focus of this role would be to develop and implement an IOTA IT plan to deliver the proposed online credit submission capability. This arrangement would initially leave Martin Atherton, G3ZAY and Dom Smith, MOBLF free to manage the IOTA database and the current IT enhancement project. In 2012, the main focus of this work has progressed to the beta testing of the ADIF log module.

To complete the structural changes the IOTA Committee and IOTA IT Working Group would be managed in terms of strategy and governance by a newly formed IOTA Steering Committee.

Whilst these changes have been started, there has been a disappointing response for a UK based person to fill either the vacancy for the IOTA IT Coordinator or to work into the IOTA Manager role.

John Gould, G3WKL

MICROWAVE MANAGER.

The Microwave Manager is responsible for all bands above 1GHz. These are home to a wide variety of activity, innovation and modes – including narrowband, beacons, ATV and EME. Active groups in the UK include data and repeater users, the UK Microwave Group (UKuG), BATC and AMSAT-UK.

The past year was particularly eventful as it included the EME2012 Conference at Cambridge, the BATC BGM as well as a full programme of regular events such as microwave roundtables, the AMSAT Colloquium and a major effort on Olympics coordination. General pressures on amateur microwave spectrum continued, notably in the 2.3 and 3.4GHz bands.

Careful preparation work on both UHF and microwave bands went a considerable way to mitigate the impact on the substantial Olympic spectrum requirements. The Society team was also able to react quickly to both amateur and Ofcom requests, as well as support the need for Ofcom temporary staff for venue engineers. Once spectrum issues were settled, it was therefore pleasing to see the record participation in Olympic prefixes, Follow-the-Torch and Special Event Stations. The experience has already been put to good use for the 2014 Commonwealth Games in Glasgow, which Ofcom has already started planning.

Like many events the microwave calendar had some adjustments to accommodate the Olympics. However this did not impede the outstanding event of the year which was the 15th International EME Conference at Churchill College – the first time the UK had ever hosted it. This was very well organised by the UK Microwave Group, assisted by their sponsors, RSGB, BATC and the local Camb-Hams group. Excellent talks, proceedings, high attendance levels, a partners programme and a trip to Bletchley/NRC all contributed to the occasion.

The space scene saw AMSAT-UK enjoying continued success with the FUNcube dongle, which operates up to 23cm. It is also making good progress towards the completion and launch of its FUNcube-1/2 satellite projects. This year's Colloquium also provided the opportunity to see the new Galileo production facilities at SSTL (a project that is causing some concern at 23cm).

For much of the year little progress was made on licensing microwave beacons and TV repeaters. However this has not stopped ongoing developments of spectrum-friendly DATV, including the innovative 'DigiLite' project. At 2.3GHz, where there are pressures for 'Spectrum Release', it is likely that changes and digitisation of ATV repeaters will be needed and is a topic of ongoing discussion with BATC and Ofcom.

Pressures on the microwave bands started to crystallise during the year. Readers are referred to the 'Spectrum Release' article in the January edition of *RadCom*, which gives much of the background. For 2013 the band plans indicate where issues will be in the 2.3 and 3.4GHz bands. This challenge is common to many other countries and now attracts increasing levels of IARU support for engaging with regulators and future strategy. The latter part of 2012 also saw WRC-15 preparations picking up. Whilst much attention is focussed on 5MHz, the Society is also participating in items on nano-satellites (Cubesats), 10GHz and 24GHz. So while the 2012 Games may be over, 2013 will no doubt be eventful too.

Murray Niman, G6JYB

PLANNING ADVISORY COMMITTEE.

The Planning Advisory Committee continues to provide advice to Members about planning issues. The advice booklet is now held exclusively on the RSGB website and feedback suggests it is well read and provides effective advice for Members. Changes to Government advice on planning means that the text needs to be revised and this work will start shortly. One change of note is that a possible reading of the new guidance suggests that an ICNIRP Certificate might be needed to accompany an application for amateur aerials. Work continues to identify the consequences of this.

An article for *RadCom* was produced and was published in the January issue. This dealt with the four year rule and its application to amateur aerials. It also served to highlight the role of the committee to those members who might otherwise have been unaware of it. Feedback was positive and a flurry of casework arose and was allocated out to committee members. A further article is being prepared about another planning issue.

Advice to individual members continues to be provided on a case by case basis direct from members of the committee. In addition, the committee had a stand at the National

Contest trophies were presented at the RSGB Convention.

Hamfest and advice was given to over 40 members.

During the course of the year, Len Paget, GM0ONX stood down as chair of the committee to concentrate on other RSGB work. He continues to be a member of the committee and handles cases from GM. I'm grateful to him for his work as Chair and for helping to ensure a smooth handover. I would also like to thank the other committee members for the work they have done on behalf of the Society this year.

Stephen Purser, G4SHF

PROPAGATION STUDIES COMMITTEE.

The Propagation Studies Committee continues to be active, both in terms of helping members understand propagation, and in pushing forward our own research, from LF to light waves.

Gwyn, G4FKH continued to prepare the HF propagation predictions for *RadCom*, the RSGB website and two other international societies. He also had an article published in the June *RadCom* entitled Solar Cycle 24 Progression. The rest of his time was taken was up with the fledgling Noise Measuring Campaign, which is now going into a more scientific phase.

Barry, G8AGN has continued his experimentation using nanowaves, both visible red and UV. In September, G0EWN and he extended the UK red light DX record to 129km. DX on UV so far is 22km. Barry also wrote an article on optical propagation for the August edition of *RadCom*, as well as giving talks. He is also moderator/owner of the Yahoo Group UK Nanowaves, which has about 150 members.

Earlier this year, Marcus, G0IJZ had a paper on an analysis of 5MHz beacon measurements published in the peer-reviewed academic journal *Radio Science.* He also presented at the 12th International Conference on Ionospheric Radio Systems and Techniques (IRST 2012) and the HF Industry Association (HFIA). Both related to comparisons between Chilton ionosonde measurements and HF predictions.

Meanwhile, John, G4BAO continued as chairman of the UK Microwave group. He successfully put together the team that applied for a NoV, arranged hardware and a site for the new transatlantic 144MHz propagation beacon GB3WGI and presented a paper on the project at the RSGB Convention. He was also a member of the organising committee for the hugely-successful EME2012 conference, continued to contribute to UKuG Newsletter *Scatterpoint* and took over the *RadCom* GHz Bands column from G4DDK.

Delegates from EME2012 visit the NRC.

Martin, G3USF continued working on the *Six & Ten* Report and prepared an article on beacons for *RadCom*. He also maintains the beacon lists for HF and 50MHz and remains Region 1 HF Beacon Coordinator.

Ron, G3SVW continued his club clinics, with Q&A sessions on propagation. He has also been discussing the noise floor measurement project and firing up some interest in MF propagation with stations trying NDB DXing between 300 and 400kHz.

Meanwhile solar enthusiast Neil, G0CAS continues to collect solar and ionospheric data from various sources on a daily basis in preparation for the weekly GB2RS solar report. He is now into his eighteenth year of doing this. His Twitter account (@spotsandflares) also has solar information on a daily basis, and has around 150 followers. Neil also runs his forum site - http://spotsandflares.lefora.com.

Meanwhile, PSC chairman Steve, G0KYA continues to publish monthly ionospheric propagation charts at G0KYA.blogspot.com. Steve also gave a number of talks about HF propagation to clubs and the RSGB Convention. His latest project has been looking at nighttime MF propagation across the Atlantic using the radio station WWBR in New York.

Finally, the Propagation Studies Committee now has its own Twitter feed – see @RSGBpropnews.

Steve Nichols, G0KYA

SPECTRUM FORUM.

The Forum brings together the RSGB Spectrum Managers, AROS and Intruder Watch, RSGB specialist consultants, chairs of RSGB committees that have an interest in spectrum management, and representatives from special interest groups within the UK amateur community. The Forum conducts most of its work via e-mail and meets annually. Input papers and the approved minutes of this annual meeting are available on the Society's website within 3 weeks of the meeting.

Individual spectrum matters will not be covered in this report as these will be covered in the relevant Managers' and some committee reports.

The main focus of the Forum in 2012 was to take its draft Spectrum Strategy through a consultation process with the Membership. This was carried out in March and both the pre- and post-consultation strategy documents along with the responses (from those who gave permission) were published on the RSGB website. Overall, the Forum saw this as a very useful exercise, both in terms of having a written strategy for the first time and for the process involving national clubs as well as ultimately the Membership.

In terms of topics covered, much of the focus in the year was on the delays in repeater and beacon clearances and the problems that that was causing. Continuing concerns were expressed over a number of topics such as the pressure on the microwave bands, interference from PLA, plasma TV and solar PV, the poor HF DX operating mostly by stations outside the UK, and several groups were keen to see extensions to various bands, specifically 160m, 80m and 40m.

Band planning was again a perennial topic, where there is always pressure for frequencies for additional specific uses to be noted on the plan. In this respect the Society has been following the lead taken by IARU Region 1 in 2005 to focus band planning on necessary bandwidth segments, keeping special usage to an absolute minimum. Progress was made on previous year's concerns, such as the issue over adherence to the 40m band plan at the interface between CW and data modes.

John Gould, G3WKL

TECHNICAL FORUM.

The Technical Forum is responsible for the technical side of RSGB's activities and is a reflector and e-mail based group allowing rapid response and discussion with all members having access and being able to contribute immediately. There has been no annual meeting this year.

Technical review of articles for *RadCom* forms the bulk of the activity taken on by the Forum. This year, over forty articles have been allocated by the Technical Editor for review, for their suitability, technical merit and for any safety implications. Articles are taken on by individuals, on a first-come-first-served basis. Perversely, there has been a lot of variability in the speed of take-up by forum members. Articles on some subjects and in certain areas get snapped up immediately with an offer to review; those in certain other areas get no volunteers at all to start with, unless pressed. This is one area that needs to be improved. It is hoped to get the Forum more involved in this area.

If you have any ideas on areas you would like the Society's publications to cover, or any direction you think we should take, please let us know.

The RSGBTech Yahoo Group http://groups.yahoo.com/group/rsgbtech/ is open to all and continues to gain in popularity, with the current membership now standing at 1131. The breadth of subjects have covered too huge a range to even begin to list here, going from basic construction right through to advanced and specialist techniques being discussed. Antennas appear to be the most popular subject, with EMC matters being a close second. With the wide range of expertise and experience amongst the members, most questions soon get answered to the satisfaction of their originator. After some issues with a couple of non appropriate messages earlier in the year, the 'ground rules' for moderation were clarified and posted on the site for reference. Moderation is aimed to be 'light touch' with very few messages being rejected on grounds of unsuitability or illegality.

With the new RSGB website scheduled to become operational soon, the Forum intends to build up our area to make it a prime point of contact for any technical information needed. Initially it is intended to have a searchable technical index of *RadCom* articles, with further content still to be decided upon. Volunteers may be requested to generate suitable content. Forum members have also taken part in discussions of the future direction of the Society's technical publishing programme.

Finally, I would like to thank all the members of the Technical Forum for their time and the support provided.

Andy Talbot, G4JNT

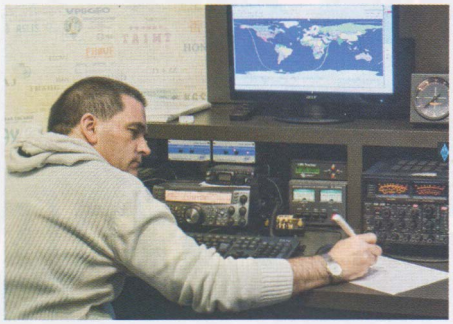
TRAINING & EDUCATION COMMITTEE.

I was appointed as chair of the new Training & Education Committee in April 2012. My first task was to recruit a committee. Over thirty people responded and most agreed to help out in some way.

Volunteers were formed into a number of project teams. Some have been more active than others but most are making progress to deliver outputs in 2013. The projects and progress are set out here.

Promotional Video: the initial idea was to update the current RSGB 'What is amateur radio' video but the project team decided that it would be better to start afresh and the consensus was that a number of short videos would be better targeted at specific audiences. That work is currently being scoped.

IT Support: Team members have been working to map across the existing web pages that relate to training and/or education to the new RSGB website. That work is about 80% complete and by the time you read this you will probably have seen the new pages. In future these will be maintained by the committee, making it easier and quicker to make changes.



World Amateur Radio Day at the NRC.

Train the Trainers: This popular course had to be stopped in 2011 due to lack of resources. The new project team has reviewed the extant material and is working to revise it to better meet its stated aims. The project team have concluded that there should be two courses, one for those new to delivering amateur radio training, and one for those looking to step up from delivering Foundation/Intermediate to deliver Intermediate/Advanced. The plan is to pilot these courses in the spring of 2013.

RCF Liaison: Two formal meetings have taken place and there has been almost daily e-mail/telephone contact with the Exam Committee Chair. I attended the RCF Standards Committee in April and chaired a joint meeting between the RSGB Training & Education Committee and the RCF Examination Committee in December. Records of both have been published.

Training Resources: this project team has not made much progress but the new website will allow new resources to be added quickly, once identified. The first of these will be a series of guides on how to conduct the training and assessment processes to complement the RCF's Conduct of Examinations guide.

Exam Item Writing Workshops: the team leader has produced an outline proposal that should see a call for volunteers very soon. The idea behind this initiative is to assist the RCF in populating its exam item database; this is very much a joint venture and I hope many trainers will support it.

I presented a lively Training & Education Forum at the RSGB Convention in October. That allowed trainers and students to air their views on the current training/exam system and to hear about new developments. The slides and notes from that meeting were shared on the Trainers Yahoo Group.

The current focus is on assisting the RCF in implementing their new Examination Management System and the associated optical marking. At the time of writing that is very much a hot topic with discussions taking place between the Training & Education Committee, RSGB Headquarters and the RCF Examination Committee.

In 2013 I am hoping to make a start on a new project with a working title of 'After Advanced'. The idea is to make available training and education events for those who have passed the Advanced exam and wish to look deeper into specific topics.

2013 will also see the start of a full three tier syllabus review for the amateur radio exams. This is no small undertaking. We are expecting a few small changes in content within the year but no major changes are planned for the next couple of years at least.

I would like to thank all of those who have contributed to the work of the committee in 2012 and to the General Manager and the Board for their support. The year ahead looks every bit as busy as the one we leave behind so please keep supporting the Society's work in training and education; it is our investment in the future of the hobby.

Steve Hartley, G0FUW

VHF MANAGER.

Following the sad event of Terry Stevens, G8DKS passing away in July 2012, it falls to me as chair of the Spectrum Forum to draft a brief account to cover VHF/UHF spectrum development and management activities during 2012.

Despite only been in post for about 5 months, Terry had made good progress in getting to know his colleagues within the Society and with his counterparts in other Region 1 national societies. He had attending the Hamfest at Friedrichshafen and was planning to attend a Hamfest in Lithuania before his untimely death.

The main VHF/UHF spectrum management activity during 2012 was to interface with Ofcom on their Olympics and Paralympics Games spectrum management project. Despite an issue relating to 2m meteor scatter frequencies, in which Terry was not involved, the arrangements for 2m and 70cm went well. Ofcom formally thanked the Society and UK amateurs for their efforts to enable temporary use of these frequencies.

The other main activity within the VHF/UHF part of the spectrum was the response to Ofcom's 'VHF Spectrum Release in the range 143 to 156MHz' consultation in October. Although not included in the consultation we were aware that additional VHF spectrum release is planned, so used the opportunity to place a marker for additional spectrum at 70MHz and for a new allocation near 80MHz. Expectations should be moderated with the likelihood of strong competition from commercial users at VHF.

In addition to assistance from Murray Niman, G6JYB during the year I would also like to acknowledge the support during the year from David Butler, G4ASR and John McCullagh, GI4BWM.

John Gould, G3WKL

Sport Radio

QRP in the Commonwealth Contest and G4MKP's receive loop for the LF bands

YOUR RSGB THE BEST CONTESTS

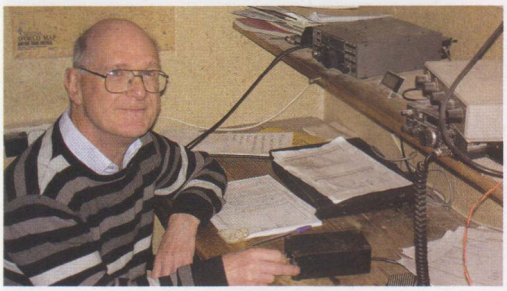


PHOTO 1: G3YMC in his shack.

75TH ANNIVERSARY CONTEST. This year is the 75th anniversary of the first Commonwealth Contest, the world's longest running DX contest. Last year Dave Sergeant, G3YMC (**Photo 1**) was the highest placed QRP entrant, so I asked him to write a little about how he approached the event. In the normal scheme of things, electing to operate QRP in a worldwide contest would make life difficult enough, but last year the weekend of the Commonwealth Contest was beset by extremely disturbed conditions. **Figure 1** shows that the A index spiked to major storm level, effectively shutting down the HF bands for a while.

Dave started his report by saying "The Commonwealth Contest is somewhat special, in that it gives the chance to work some of the slightly rarer countries on the air without competition from the rest of the world – in theory, at least. However, as a QRP operator, it is still far from easy. Calling CQ is unlikely to bring many QSOs, so it is 100% search and pounce. It is also a pretty casual affair, taking one's time to tune the bands and join mini pileups for those entrants who are operating DXpedition style in various parts of the world, or rather quicker QSOs with those in VE. In 2012, like in other years, I used my normal station – an Elecraft K2 running 5W, a 65ft low(ish) long wire and a vertical for 15m; the sort of setup many would (and do) laugh at. Not having a decent antenna for 80m, I concentrated on the higher bands and there was no overnight operation.

"Conditions are what makes or breaks this contest, and 2012 was no exception. Solar storms were the order of the day, with the A index reaching 78. Saturday morning only brought four contacts – the stalwarts in Cyprus, ZB2EO, and 5N7M on 10m and 15m. After a leisurely lunch the bands had opened to VE and a few of these were worked, together with the 9H boys and the Caribbean, but with only 25 QSOs by teatime it might well have been a BERU to forget.

"But the contest always has some surprises. Nigel, G3TXF, operating as ZD7XF from St Helena was worked on the three HF bands. In each case just one call was needed. One VK was worked on the Saturday on 20m and 40m, but the hoped-for opening to VK/ZL on 40m at dawn failed to appear.

The dawn session did though raise a few of the Caribbean stations. GB75CC, the HQ station with a special call for the Queen's Jubilee, was only worked on the LF bands, showing the problems of skip distance to this part of the UK." GB75CC was operated from the GM2V contest station near Inverness, but Dave lives about 460 miles away in Bracknell.

"44 QSOs in around 14 hours of operating (putting me in the 24 hour section) was not much to show for my efforts... but, so what, I won the QRP certificate! Have a go this month, you will enjoy it – even if the sun doesn't cooperate."

All participants in this year's Commonwealth Contest who make 75 or more valid contacts will be entered into a prize draw, with the lucky winner carrying away an RSGB Centenary Key (**Photo 2**). Made by one of the world's leading Morse key manufacturers – Vibroplex – and based on their popular iambic design, this limited edition Morse key is only available from the RSGB. The RSGB President will make the prize draw at the Convention in October.

REDUCING THE NOISE. Last month Terry Burbidge, G4MKP described the 80m/160m antenna he uses to great effect from his modest sized garden. But radiating a decent signal is only half the battle, because it's no good if local electrical noise means you can't hear much. These days local noise can seriously spoil our fun, and it tends to be worst on the LF bands. G4MKP's answer is a receive loop.

Terry says, "Like many of us, I suffer with man-made noise on 160m and, to a lesser degree, some noise on 80m also. The 'if you can't hear them you can't work them' maxim could not be truer, particularly on Top Band and especially from chez G4MKP. My inverted-L is susceptible to noise from nearby properties. It's much better when everyone has gone to bed of course, but still quite noisy. It can make copying DX on 160m impossible and difficult on 80m. My loop enables me to eliminate or reduce S8/S9 noise to a level that is nothing more than a little annoying, the result being that I can hear North American stations at around S1-S4 that are completely inaudible on the main antenna. Indeed, in CQWW CW 2012, W3LPL (early in the evening), D4C and C5A were unworkable on the main antenna, but on switching to the loop and I could have had a rag chew with them all. The thing to bear in mind with this type of antenna is that it drops the noise floor, thus enabling you to hear those weaker stations. It is very unlikely to out-perform an elevated antenna in terms of signal strength, but for contesting all we need to do is copy the callsign and exchange before moving on to the next station.

"Once again the solution was already out there, this time kindly provided by KC2TX (www.qsl.net/kc2tx). Simon, MOVKY built the wooden support frame and I built the antenna, termination box and tuning (a 500pF variable capacitor). The variable capacitor appears to be about optimum for 160m at around 470pF. To tune it, finding a station and tuning for maximum signal is all that's required. Although not entirely necessary, I added a rotator, which is useful when the rain and snow are about." This is because receive loop antennas have a sharp null. The null can be very useful if you are trying to remove a single local noise source, but a nuisance if the null is in the direction of a station you wish to work. "I found a reasonably priced lightweight model on eBay. My interpretation of KC2TX's design

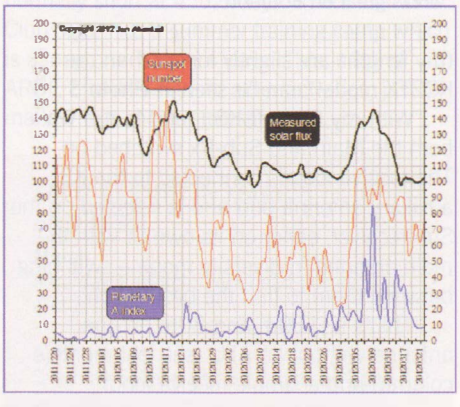


FIGURE 1: Graph of solar conditions from November 2011 to March 2012. The spike in the blue line coincides with the Commonwealth Contest. Solar info from Jan Alvestad.

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Mar 4	80m Club Championships	2000-2130	Data	3.5	RST + SN
Mar 9-10	Commonwealth Contest *	1000-1000	CW	3.5-28	RST + SN (HQ stations also send "HQ")
Mar 13	80m Club Championships	2000-2130	CW	3.5	RST + SN
Mar 21	80m Club Championships	2000-2130	SSB	3.5	RS + SN

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Mar 2-3	144/432MHz +	1400-1400	All	144/432	RS(T) + SN + Locator
Mar 5	144MHz UKAC	2000-2230	All	144	RS(T) + SN + Locator
Mar 10	70MHz Cumulative #2	1000-1200	All	70	RS(T) + SN + Locator
Mar 12	432MHz UKAC	2000-2230	All	432	RS(T) + SN + Locator
Mar 19	1.3GHz UKAC	2000-2230	All	1.3	RS(T) + SN + Locator
Mar 26	50MHz UKAC	2000-2230	All	50	RS(T) + SN + Locator
Mar 26	SHF UKAC	2000-2230	All	2.3-10G	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange (info)
Mar 2-3	ARRL International DX	0000-2359	SSB	1.8-28	RS + tx power (Ws send State, VEs Province)
Mar 3	UKuG Low Band	1000-1600	All	1.3-3.4G	RS(T) + SN + Locator
Mar 16-18	BARTG HF RTTY Contest	0200-0200	RTTY	3.5-28	RST + SN + time
Mar 16-17	Russian DX	1200-1200	CW, SSB	1.8-28	RS(T) + SN (Russians send Oblast code)
Mar 30-31	CQWW WPX SSB	0000-2359	SSB	1.8-28	RS + SN

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

PHOTO 3: G4MKP's 160m receive loop, which "works great on 80m too".

(my lengths are slightly longer than the KC2TX model) can be seen in **Photo 3**.

"With my Elecraft K3 I tend to run with both the Main and Sub-Rx switched on. The receive loop is connected to the K3 auxiliary antenna port and is selected on the Sub receiver, either on its own or with the main antenna in diversity mode – switching between them to find the best option.

"That's it. 160m and 80m on one antenna without an ATU (see last month's column) and a simple receive loop."

THIS MONTH'S EVENTS. HF contesting begins with the datamodes leg of the 80m Club Championships on Monday 4th. This is followed on 9th – 10th by the 75th running of what many regard as the most gentlemanly of RSGB events – the Commonwealth Contest. It's a worldwide 24-hour CW event that's largely free of Continental European activity, because the only contacts that count are between Commonwealth countries. Every year some quite rare entities are activated by DXpeditioners and this year will be no different. A list of Commonwealth Call Areas can be found at www.rsgbcc.org/hf/information/codes.shtml. After that it's back to the 80m Club Championships, with CW on Wednesday 13th and SSB on Thursday 21st.

This first VHF event is a major one, being the 144/432MHz Contest on 2nd – 3rd. The weather often makes portable activity a real challenge for this, but the hardiest of souls will always find a way of getting on the air from a hilltop, in spite of snow or gales. We then move into the UKACs, with 2m on the 5th. The second session of the 70MHz Cumulative Contest takes place on the 10th. There will be three further sessions across the coming months. After that it's back to the UKACs for the remainder of the month, with 70cm on the 12th, 23cm on the 19th, and 6m plus SHF on the 26th.

Non-RSGB events begin with the SSB leg of the ARRL International Contest on 2nd – 3rd. The CW leg took place last month, so please see February's column for more information. On Sunday 3rd the first of five UKuG Low Band series of contests takes place. The bands for this one are 23cm, 13cm and 9cm. The British Amateur Radio Teledata Group's (BARTG) HF RTTY Contest takes place on 16th – 18th. Please note the start/finish time is 2am. Exchange a signal report, a serial number and the time in GMT. The multipliers are countries (plus call areas for W, VE and JA and VK) and continents. For single-operator stations there are time-limited 6-hour all-band and 30-hour all-band or single-band categories. Only multi-operator stations – single- or multi-transmitter – can operate the full 48 hours. For 24 hours over the same weekend the Russian DX Contest takes place. There are numerous entry categories, for single- and multi-band, single- and multi-mode, multi-op, various power levels, clubs, etc. An interesting aspect of this event is the possibility of submitting two single-band entries, eg 10m and 80m. Work everyone and send a signal report and serial number, but expect Russian stations to send you a signal report and a 2-letter Oblast code. The SSB leg of CQWW WPX Contest rounds off the month on 30th – 31st (Easter weekend). The RTTY leg took place last month, so please see February's column for more information.

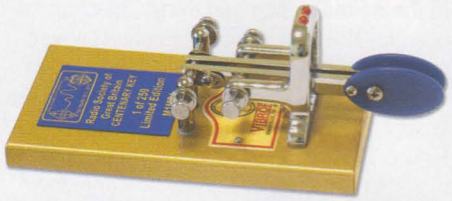


PHOTO 2: Make more than 75 QSOs in the 2013 Commonwealth Contest and you might win a limited edition RSGB Centenary Morse Key.

ARDF

ARDF in Eastern Europe

YOUR RSGB
ARDF: DEDICATED TO DF HUNTING

Jiri, OK2BWN in action at the World Championships 2012 in Serbia.

CONTINUING. Part two of the interview with Jiri Marecek OK2BWN, the 'brains' behind the most successful ARDF team in the World. This part concentrates on the involvement of young people in the Czech Republic and the their system of training camps. Part 1 appeared in the January 2013 *RadCom*.

Tell me how do you manage to get young people involved?
Jiri: Our club is focussed a lot on young people. Last year we started with children as young as 4 years old. We called it an ARDF kindergarten. There are about 20 children in the age group 4 – 6 for whom we organised 'trainings', one afternoon a week where we organised games in the forest. Not real ARDF or orienteering but we got them used to moving about in the forest and accustomed to the outdoor life – some basic running, in addition to the idea of competing. The emphasis of the sessions was on games, which engaged them.

Give me an example of one or two of these games then.
Jiri: Some chasing games or hide and seek in the forest with the seekers being given a direction and a distance to the hider. Sometimes we have a treasure hunt with prizes and this is the favourite.

How do they know where to look in this treasure hunt?
Jiri: We give them a simple map, more of a picture than a map. They look at the picture and work out where the treasure is located. The children are very small and are not yet able to read, so we cannot use figures and letters. It is within the range of their intellect and there are no problems with it.

This has several advantages. When these children grow to the age of 7 or 8 they are already 'into' ARDF and are not tied to another activity. There are lots of other sports clubs who also look for new members – athletics, football, scouting and others.

From the ages of 8 to 15 we have another group of about 20 to 25 children who participate in ARDF, orienteering and running. From the age of 10 we are able to allow them out into the forest alone. In the beginning they are shadowed by an older person. This really helps the child to learn to use the receiver and the map. Finally the shadowing is done from a distance, so the young person appears to be alone in the forest.

Tell me a bit about the training camps that you run, I have heard about these. When do they take place, how long do they last, who comes to them and what sort of activities do you run?
Jiri: The programmes for our club training camps and the ones for the national team are quite similar. Our club organises about three or four camps per year. The first one is in February and it is mostly based on cross country skiing and orienteering. It is mostly for athletic preparation and does not include ARDF because it is very cold at that time of year in Czech.

At the beginning of May we organise our spring training camp and this lasts for 3 or 4 days – the weekend plus one or two days. This is full of short competitions focussed on work with the receivers and the map. In summary, it concentrates on technical details. It is connected with the District championships, which in our case is the biggest event in Moravia. On one day the competitors who are not attending the camp arrive and this is the day of serious competition.

What sort of venue do you use for these camps?
Jiri: Some recreation facility, which is quite cheap. They either provide food or we take someone who can organise some catering. The requirement is to have one or two orienteering maps of areas directly adjacent to the accommodation. There is no possibility of providing transport for everyone out to the areas. We can then have two or three competitions each day. The main competition will be in the morning, the second a bit shorter in the afternoon and then a sprint event perhaps in the area of the accommodation itself after dinner.

One week after this camp there is a national level competition so the participants are well prepared for it.

Moving to the National training camps now. Are these just an increase in the level of the ability of the participants?
Jiri: The organisation is generally the same. The programme always depends on the level of the competitors who are participating. At national level, the daily competitions are longer and more difficult, maybe combined with orienteering having some O controls at the end of the course. This forces the ARDF competitors to be 'tied in' with the map. They have to know where they are on the map all the time.

The national ARDF team will organise about eight training camps each year. They are normally short at 4 to 5 days. In addition our Club organises a summer training camp which is a long one 10 to 14 days. This is full of ARDF, orienteering and other activities, just to make things more interesting.

ARDF EVENTS IN MARCH AND APRIL

March
Saturday 2 March: Hindhead Surrey 144 and 3.5MHz

April
Saturday 6 April: Leicestershire 144 and 3.5MHz

Further details at
www.rsgb.org/radiosport/ardf

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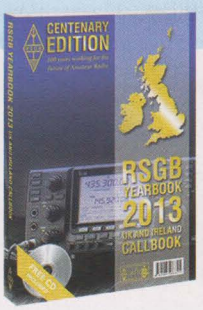

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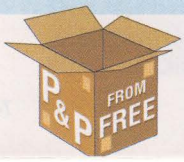

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Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, e-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282,29 October, On the Air. It's that simple. Please note that we don't normally print 'closed', 'TBA' or 'every Tuesday' type submissions. The deadline for the April 2013 *RadCom* is 23 February and for the May 2013 edition it's 25 March. For GB2RS,the deadline is 10am on the Thursday for the week of broadcast. If you need to amend your club details, please visit www.rsgb.org/clubupdates.

INTERNATIONAL

PAFOS RADIO CLUB, CYPRUS
Richard, 5B4AJG, 00357 97857891, 5B4AJG@cyprusliving.org

NATIONAL

Civil Service Amateur Radio Society weekly net every Tuesday 8pm 3.763MHz

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, RM1@RSGB.ORG.UK

Ayr ARG
Tom Ferguson, GM1OST, 01292 532 088
6 Pre-IOTA planning
20 Visit to Bang and Olufsen, Glasgow

Cockenzie & Port Seton ARC
Bob, GM4UYZ, 01875 811 723, www.cpsarc.com
1 Normal club night
22 Radio check night, John, MM0JXI

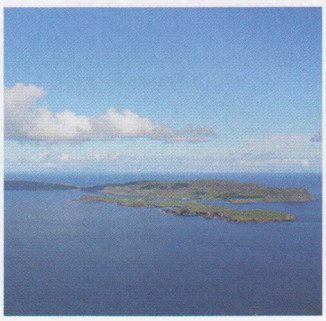
Kilmarnock & Loudoun ARC
Graham, MM3GDC, mm3gdc@btinternet.com
12, 26 Club night

Livingston & DARS
Norman, GM1CNH, 07740 946 192, uk.groups.yahoo/group/ms0liv
5, 19 Club evening
12 Operating evening
26 Morse code practice

Lothians RS
Alan J Masson, GM3PSP, 0131 623 4580, alanjmasson@virginmedia.com
13 The Changing Face of Antarctic Communications, Mike Gloistein, GM0HCQ, British Antarctic Survey
27 The Sinking of the Flying Enterprise, Angus, MM1CCR

Members of **Kilmarnock and Loudoun ARC** will be making their spring IOTA DXpedition to the Isle of Canna, one of the small isles on the west coast of Scotland, from 22 to 26 April. The operators will include Graham, MM0GHM, Allan, 2M0VNW, Jason, GM7VSB, Arthur, MM0DHQ, Paul, GM0PJD, Allan, GM3OZB and Peter, GM7AAJ. They will be using the callsign MM0KLR. Bureau QSL cards should go via MM0KLR and direct QSLs to MM0GHM.

This will be the third small isle the club has activated since 2010, having visited the isles of Eigg and Muck in previous years.



Two other members of Kilmarnock and Loudoun ARC, MM0BIM and GM3YEH will be joining the EJ7NET team on their DXpedition to the Aran Islands on the west coast of Ireland.

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

Aberdeen ARS
Fred Gordon MM0ODL, 01975 651 365
7 Junk sale
14 Repeater group AGM
21 Construction night
28 Morse & on the air

Dundee ARC
Paul, GM0BKC, 07846 412 862
5 Club night
12 Construction night
19 CW practice
26 On air night

Dundee Amateur Radio Club would like to congratulate four students who recently passed their Intermediate exam and now have new 2M0 callsigns. The photograph shows, from left to right, Ally, MM0DRA (Club President); Martin, 2M0KAU; Sam, 2M0HHH; Malcolm, 2M0INE; Alan, MM0EQE (instructor) and Gabriel, 2M0XZX.

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

Chester & DRS
Bruce Sutherland, M0CVP, 01244 343 825
5 Talk by construction competition entrants
12 Committee meeting
19 Surplus sale
26 Propagation, Dr Brian Austin

Mid-Cheshire ARS
Peter Paul Fox, G8HAV, 01606 553 401
6 Calibration evening + Foundation & Intermediate training
13 Review equipment in store + Foundation & Intermediate training
20 Committee meeting + Foundation & Intermediate training
27 Surplus equipment sale + Foundation & Intermediate training

South Manchester R&CC
Ron, G3SVW, 01619 693 999
7 Ron's CW clinic
14 Home construction techniques, Ged, G8RSI
21 Equinox surplus equipment sale with Peter, G0BHP
25 Technical forum
28 Review of your amateur radio New Year's resolutions with Dave, G4UGM

Stockport RS
Nigel Roscoe, 07973 312 699, info@g8srs.co.uk
5 Foundation/new licensee evening
19 Project night with Tom Spence, M0DCG

Workington & D AR&IT Group
Barry Easdon, G0RZI, 01946 812 092,
4 Club meeting and on the air
18 Phased verticals, Paul, M1PAF

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
4, 11, 25 On the air
18 Further development of an affordable ATU demo, Zoltan Derzsi

Denby Dale RC
Richard, M0RBG, 07976 220 126, m0rbg@talktalk.net
2 Foundation course at Pie Hall
6 Annual surplus auction sale with refreshments and licensed bar
13, 27 On the air, ±145.575MHz, 19.30
20 Start of 3 days operating G100RSGB from Cartworth Moor as part of RSGB Centenary Celebrations (no meeting at Pie Hall)

Sheffield ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
4 Social night + RSGB 80m Club Contest as G3RCM
11 My DXpedition to the Dominican Republic, M0GDX
18 CW night: group instruction and practice
25 AGM

Tynemouth Amateur Radio Club
Bob, M6KLO, mail@g0nwm.com

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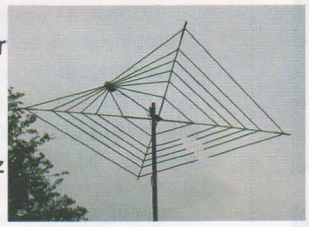

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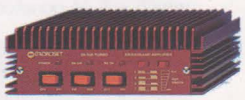

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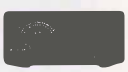

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2, 3 Operating G100RSGB Centenary Special Event Station
8 Low band DX from your garden
15 Mini antennas for QRP
22 Homebrew QRP
29 GONWM QRPp (milliwatt challenge) on air

Tynemouth ARC will be operating the RSGB Centenary Special Event station Gx100RSGB on Saturday 2 and Sunday 3 March. The club intend to be on all HF bands working SSB, CW & data (PSK63). It is also possible that they may run a 2m/70cm station. Details on how to claim your QSL card and information on the Centenary award can be found on the RSGB website, www.rsgb.org.uk/centenary.

Denby Dale Amateur Radio Society, who this year will be celebrating their 40th anniversary, has confirmed that the annual Mills On The Air event will take place over the weekend of 11 and 12 May. After another very successful event last year they are hoping for another large number of stations activating watermills and windmills throughout the UK and Europe. To see all the stations taking part or to register your own station see the DDARS website, www.g4cdd.net. To claim a certificate for working 10 or more Mills On The Air stations send a minimum of £5, which will be donated in full to The Society for Protection of Ancient Buildings, together with your log, to Gerald, G3SDY, or for full details e-mail g3sdy@sky.com.

Thwaite Mills Island, GB2TMI, operated by DDARS.

The four latest Foundation passes at the **Wakefield & District Radio Society** took their exam in January. From left to right they are Gerard Fleming, Victoria Fleming, Michael Sanderson and Peter Smith. The club would like to congratulate them all and the Training Team for this latest success.

REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, MOVRR, RM5@RSGB.ORG.UK

Aldridge & Barr Beacon ARC
Albert, G0KFS, 01922 614 169
4 Antennas for VHF UHF
18 AGM
Central Radio Amateur Circle
Martin Hallard, G1TYV, 07906 905 071, radio-circle@live.co.uk
14, 28 On the air from 20.00, 145.375MHz
16 Plug and play day at Barr Beacon from 10am (depending on the weather)
Coventry ARS
John, G8SEQ, 07958 777 363
1 Kiribati T32C
8, 15, 29 Project 2013 construction night
22 President's night
Gloucester AR&ES
Anne, 2E1GKY, 01242 699 595, daytime, www.g4aym.org.uk
4 DF hunt in the school grounds – you need a Top Band receiver and directional antenna, plus boots if it's muddy
11 HF operating
18 Informal meeting
25 No meeting – school closed
Stratford Upon Avon DRS
G0CHO, 01608 664 488, cousbey@theiet.org
11 Test equipment evening, John, G0JUQ – bring a rig for testing
25 Informal evening
Sutton Coldfield ARS
Robert Bird, spirit.guide@hotmail.co.uk
4, 18 Net on 145.250MHz from 7.30pm, all welcome
10 Wythall rally visit
11 On the air, natter and general get together
12 Net on 70.475.00MHz from 7.30pm, all welcome
25 On the air, natter and general get together
Telford & DARS
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@blueyonder.co.uk
6 Committee/Hamfest meeting & GX3ZME on the air, HF/2m
13 Main construction competition
20 Lenses – how and why, MORJS
27 AGM
Wythall Radio Club
Chris, G0EYO, 07710 412 819
1, 8, 15, 22, 29 Shack social
3, 10, 17, 24, 31 Club net on 145.225MHz, 20.00
4 Intermediate course; 80m Club Championships Data Contest
5, 12, 19, 26 Morse class, 19.45
5 Final rally preparation /144MHz UKAC Contest
9 Rally set up at Woodrush School, 14.00
10 Wythall RC Radio Rally at Woodrush School, Shawhurst Lane, Wythall, 06.00
11 Intermediate course mock exam, 20.00
12 Committee meeting & post-rally report, 20.30
13 80m Club Championships CW Contest, 20.00
18 Intermediate exam, 20.00
19 Circuit Wizard – it really is magic! –Chris, G0EYO, 20.30
21 80m Club Championships SSB Contest, 20.00
25 Curry night at the Monsoon, 18.30
26 Fun with the CQ WPX SSB Contest – Lee, G0MTN, 20.30
28 – 31 Wythall RC Easter Contest
30 & 31 CQ World Prefix (WPX) SSB Contest

The Special Event callsign GB1PER will be operated by members of the **Worcester Radio Amateurs Association** on 19 and 20 March as a demonstration station for the primary school at Perdiswell, Worcester. This is in participation for this year's National Science Week. Bands operated will be HF and VHF during school hours, with the intention to give as many junior children as possible the opportunity to get on the air. The event will also show how amateur radio encompasses the spectrum of the science curriculum.

Some two weeks later, GB1PER will be activated for the annual Airfields on the Air event on Saturday 6 April. This will be from the grounds of the school. The location is on the former site of the Second World War military airfield, which was the world's first municipal aerodrome and taken over 75 years ago by the RAF, finally closing in 1953. Despite being a relief landing ground, it was the wartime location for the Kings' Flight and a famous visitor was Clark Gable, who subsequently crash landed and skidded off the runway.

Gloucestershire County RAYNET recently undertook a Table Top Exercise with Gloucestershire Fire & Rescue Service (GFRS). This was as a result of discussions and a closer working relationship in the last few years – mainly from the floods that hit the county in 2007. Under the aegis of the Local Resilience Forum (LRF), good contacts were made with the GFRS management through the auspices of the Chief Fire Officer. Under a multi agency exercise held on the River Severn under the Watermark label in 2011, RAYNET provided the communications infrastructure overarching all participants, and it became quite apparent early on that we were able to technically achieve what was needed to co-ordinate a multi-agency operation. The extra provision of APRS in showing mobile traffic locations opened a few eyes and the group departed the scene with the knowledge that we were now counted as serious members of the LRF.

Through the persistence of their Operations and Planning Officer, Tony Ayres, MOTAY, the contacts with GFRS became more established and now are at a point where GFRS are installing amateur band antennas on their fire tower at a station in the Forest of Dean and are seriously looking at repeating this on some of their major sites county wide. A meeting

was held between RAYNET, operational management of GFRS and their IT section to see how a mutually beneficial working relationship could result. From this meeting, GFRS decided that they would like to initiate a process to develop a strategic alliance with RAYNET, but they needed to know their capabilities before moving to this stage.

To evaluate their capabilities, including strengths and weaknesses, they were invited to participate in a Table Top Exercise. The exercise, involving two teams of Group members, proved extremely worthwhile in being able to demonstrate their technical ability, problem solving under pressure, provision of support in areas where GFRS themselves had not seen such openings, and also to learn of their limitations. For example, in the county, only the full-time manned fire stations have generators for extended electrical outages – the retained stations do not. Their handheld radios are only 500mW output – not good in the somewhat rugged and heavily forested country.

It also highlighted some constraining factors in RAYNET's own plans. For example, how many members could be restricted by employer requirements if required on a call out? How many may have family responsibilities for children, the elderly, or infirm relatives and could not attend an extended timescale event? How aware are RAYNET of member capabilities, what equipment they carry in their vehicles on a full time basis, or how much would have to be obtained from home? Indeed, what vehicular capabilities do they have – how many can tow equipment if needed? How many are trained up in the operation of our two trailer masts?

Following on from this exercise, GFRS have formally approached Gloucestershire County RAYNET to initiate the drafting of the Strategic Alliance and the group has started an exercise to develop a more detailed database of capabilities as part of their planning to support GFRS. They intend to put a complete member database of knowledge, vehicles, training acquired, so that whoever of the Group management is handling the first phases of a call out, the initial activation of members with suitable equipment and background of setting up a control station can be deployed first, with a second phase then being brought up to standby as required. It became evident quite quickly that RAYNET would need to appoint a person as 'Event Logistics Officer' to handle welfare and consumables, and for an extended time event, to start up liaison with Zonal resources, for the resupply of operators.

Gloucestershire County RAYNET look forward to working with GFRS in the future, with plans now being laid for RAYNET operators to take their VHF marine licences to assist in requirements to support waterborne operations of both GFRS and their other Strategic Alliance partner, the Severn Area Rescue Association (SARA).

A large scale multi-agency exercise is planned in the region in the next few months and they look forward to working with our fellow LRF member agencies in providing an additional layer of communications resilience.

For information on the Group, please visit www.glosraynet.org.uk.

The Central Radio Amateur Circle started in February 2012 when four like-minded people got together to play radio. The main idea of the group was to find places to operate from and keep it simple. By the first get together they had grown to ten members and set about organising their first event, which was on Barr Beacon in March 2012. It was a good day playing radio.

Central Radio Amateur Circle on Barr Beacon

Ash, 2E0KAS passes the first exam.

The group was very active during 2012 and had a number of plug and play days on Barr Beacon, quite a few nights on the air and have taken part in Transmission 2012 for British Wireless for the Blind. In October they had their first exam and Ash, 2E0KAS passed with flying colours.

In November they had two sit the Intermediate exam and they also passed with high scores; well done to Ian, 2E0ZXQ and Eva, 2E0EFM. Now in 2013, the group has grown to 97 members from all walks of life and all licence classes plus short wave listeners. In the next few weeks they will be completing the club's first Foundation course. The training program offers online courses to facilitate the students' needs, meetings for practical assessments and the exam.

So with a number of events planned for this year, they encourage other amateurs to listen out for MXOPPC on the bands.

Ian, 2E0ZXQ and Eva, 2E0EFM pass too.

REGION 6: NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

Dragon ARC
Stewart Rolfe, GW0ETF,
07833 620 733
4 Club matters
18 Chairman's night

Wrexham ARS
Frank Bailey, M1EYH,
fcbailey20@btinternet.com
5 AGM
19 Cellnet communication

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
14 Using simple test equipment with your homebrew radio project, Simon, GW0NVN
28 Club night on the air on 145.500MHz then 145.550MHz

Llanelli ARS
Craig, MW0MXT,
01269 845 773,
craig@mw0mxt.co.uk
1, 4, 11, 18 GB4SDD on the air
4 Junk sale and club raffle
11 Club raffle
18 Social evening
25 Junk sale & club raffle

REGION 8: NORTHERN IRELAND

REGIONAL REP: PHILIP HOSEY, MI0MSO, RM8@RSGB.ORG.UK

Mid Ulster ARC
Brian Burns, MI0TGO,
muarc.secretary@yahoo.co.uk
5, 12, 19, 26 Shack night; Intermediate course continues
10 Review of the Club's involvement in the recent BBC high altitude balloon launch by Graeme, 2I0WGM
16 Intermediate exam
24 MUARC promotion at the Lough Erne Amateur Radio Club rally

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: LARRY SMITH, G4OXY, RM9@RSGB.ORG.UK

Burnham Beeches RC
Dave, G4XDU, 01628 625 720
4 AGM
16 Weekend event: DX picnic
18 Club visit to ML&S

Coulsdon ATS Steve Beal G3WZK, secretary@catsradio.org
11 Talk by Mike, G0JMI of Alton Antenna Arrays

Cray Valley RS
Malcolm Bryan, G8MCA, 07906 433 965
7 Annual construction contest, presided over by Chris, G0FDZ
21 Presentation on operating in the UKAC VHF/UHF Tuesday evening contests, Malcolm, G8MCA and introduction of rules for the new Cray Valley operating award

Crystal Palace R&EC
Bob, G3OOU, 01737 552 170, g3oou@aol.com
1 The curious story of the Crystal Palace lost railway, Barrie McKay of the Crystal Palace Museum

Dorking & DRS
Garth, G3NPC, 01737 359 472, www.ddrs.org.uk
26 Talk on radio control, Darren Harvin, M0PRV

Edgware & DRS
Mike, G4RNW, 02089 500 658, michael.stewart5@ntlworld.com
14 Really useful books, Steve, G0PQB
28 Aviation between the wars, Mike, G4RNW

Newbury & DARS
Rob, G4LMW, 01635 862 737, g4lmw@btconnect.com
2 Intermediate course tuition weekend
4 80m Club Championships DATA
13 80m Club Championships CW
21 80m Club Championships SSB
27 The history & future of the RSGB, Alison Johnston, G8ROG
30 WPX SSB (G7N at G3ZGC QTH)

Reading & DARC
Pete, G8FRC, 01189 695 697
14 A beginners guide to DXing, Don Field, G3XTT
28 Junk sale

Shefford & DARS
John Burnett, 2E0OAK, 07860 804 793
7 AGM
11 Committee meeting
14 Phased antenna arrays, Don, G4LOO
21 The Event, Stewart, G3RXQ
28 No meeting – Maundy Thursday

Southgate ARC
Mr K Mendum, G8RPA, g8rpa@arrl.net
13 Spring junk/surplus sale

Surrey Radio Contact Club
John, G3MCX, 020 8688 3322, secretary@g3src.org.uk
4 Surplus sale
18 Natter and fix it night

Sutton & Cheam RS
John, G0BWV, 020 8644 9945, info@scrs.org.uk
21 A brief history of airborne surveillance radar in the UK, Prof Simon Watts, G3XXH

Verulam ARC
Ralph, G1BSZ, 01923 265 572, g1bsz@aol.com
14 Social with GB3VH repeater group
19 Decoding RTTY on a PC, David, G3YYD

Wimbledon & DARS
Andrew Maish G4ADM, 02083 353 434
8 Members' reflections on 50 years of our radio society
29 No meeting – Good Friday

Amateur Television was the subject of a talk given to **Verulam ARC** in January by Phil, G8XTW of Dunstable Downs ARC and Dave, G8AOM of SW Herts UHF Group. It covered the history of ATV and the equipment needed for both analogue and digital operations. This was followed by a demonstration of the use of repeaters and the internet streaming service provided by the British Amateur Television Club (BATC). The meeting was also attended by members of the Dunstable Downs and Harrow Clubs.

Bromley and District Amateur Radio Club is planning to run an Intermediate course on three Saturdays – 6 and 20 April and 4 May. This follows their recent Foundation course.

If you are interested in any of their training courses, check out their website at www.bdars.org/training0206.shtml.

REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: MICHAEL SENIOR, G4EFO, RM10@RSGB.ORG.UK

Brede Steam ARS
Steve, 01424 720 815, m0nuc@aol.com
2, 5, 12, 19, 26 At the shack

Farnborough & DRS
Neville, G3SPD, 01252 404 816
1, 8, 15, 22, 29 2m net, 144.675MHz, 20.00, all welcome
4, 11, 18, 25 80m slow Morse net, 3.570MHz, 13.00; Top Band net, 1.995MHz, G2DX, 8pm, all welcome
6, 20 Slow Morse, 1.995kHz, 20.00, all welcome
13 Talk by Kevin, G7BCS
27 Maritime History, the Halifax event, Ken, 2E0DRW

Harwell ARS
Malcolm, G8NRP, 01235 524 844, info@g3pia.org.uk
12 Mini-Beam development, Mike, G0JMI
26 Shack activity night

Hastings E&RC
Gordon, 01424 431 909, www.herc.uk.net
27 RC model aircraft development + flight simulator, by 1066 Model Flying Club

Horndean & DARC
Stuart, G0FYX, 02392 472 846, www.hdarc.co.uk
7 Natter night/social evening
21 Mike from Alton Antenna Arrays

Horsham ARC
Alister, G3ZBU, 01932 242 243, www.harc.org.uk
7 Junk sale
28 Social at The Star, Rusper

Itchen Valley ARC
Liz, M0ACL, 02380 254 599, m0acl@ivarc.org.uk
8 AGM

Southdown ARS
John, G3DQY, 01424 424 319
4 Antenna construction, Alistair, G4RUL
6 Operating at Hailsham shack

Swindon & DARC
Den, M0ACM, 07810 317 750, www.sdarc.net
7 Activity night
14 Amateur radio astronomy, Brian Coleman, G4NNS
21 Activity night
28 Closed for Easter

Worthing & DARC
John, G8FMJ, 01273 593 232
3 Monthly breakfast meeting at the Goring Café, 9am
6 Surplus equipment sale
13 Discussion evening + 80m CC-CW contest
21 80m CC-SSB contest
27 GX3WOR on the air evening

The **Lymington Community Centre Radio Club** (M0LCC) recently concluded another very successful Foundation class with all four candidates passing. Congratulations to Peter, M6HYT, Allen, M6CFY, Mike, M6MZZ and Owen, M6OAH. Four candidates from the previous Intermediate course are also coming to the end of an Advanced class.

Peter and Allen during the Morse appreciation session.

An Intermediate level course is expected to commence after Easter. Further detail on any of their training course, please e-mail richard@hamandchips.com.

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Mike G3SED – our boss, recently awarded the ROTAB Trophy for 'outstanding lifetime DX achievement' by RSGB President Dave Wilson M0OBW

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BRAND NEW! GUARANTEED price match GUARANTEED

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Rugged 100W Output Power HF/6m Transceiver

- TX Range: 160 - 6 meters
- RX Coverage: 30 kHz - 56 MHz
- Operating Modes: USB, LSB, CW, AM, FM
- New large colour TFT display panel

£2399

FT-950	HF/6m 100W + ATU/DSP Base	£1264
FT-897D	HF/VHF/UHF All Modes Portable	£799
FT-857D	HF/VHF/UHF All Modes Mobile	£699
FT-450D	HF/6m 100w Base/Portable	£849
FT-817ND	Low Power All Mode Portable	£549
FTM-350R	Dualband VHVF/UHF Mobile	£599
FT-8900	Quadband 2m/6m/10m/70Cms	£385

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Kenwood TS-990

Flagship HF/6m Transceiver

- Covers all Amateur Bands from 1.8 - 50MHz
- Dual TFT display panel with band scope
- Dedicated triple DSP's for main & sub receivers
- Up to 200 Watts output

£6599.95

TS-590S	100w HF/6m + ATU/DSP..Base	£1199
TS-480SAT	100w HF/6m + ATU..Mobile	£779
TS-480HX	200w HF/6m + ATU..Mobile	£879
TH-D72E	Twinband Handheld + APRS/GPS	£429
MC90	Deluxe Desktop Microphone	£189.95
SP23	External Loudspeaker	£69.95
YF107SN	Narrow 1.8kHz SSB Filter	£109.95

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DX-SR8 HF Transceiver - with QRP output facility!

- Transmit: 1.8 - 30MHz Amateur Bands (5MHz optional add £25 cost) RX: optional 135KHz to 29.9999MHz
- TX: SSB, CW, AM, FM
- Power: 100W SSB/CW/FM - 40W AM
- QRP – 0.1 to 2W output variable
- Built in CW Keyer
- Dual VFO, 600 Memory channels
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- Repeater shift for 10M, CTCSS
- Requires 12V DC supply (not included)

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DJ-G7E Tri-Band Transceiver

- Covers 2m, 70cms & 23cms
- Super wide band receive 500kHz to almost 1,300MHz
- Modes: AM, FM, WFM
- Memories: 1000
- CTCSS/DCS encode/decode
- Internal Vox control

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DR-635

Advanced Twinband VHF/UHF Transceiver

- Full Duplex operation 145/433MHz
- Power 50W VHF/35W UHF adjustable
- Built-in Duplexer for single Antenna operation

£299.95

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200W Amp

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HLA-300V+ w/fans

300W HF Mobile Amp

- Frequency: 1.8 - 30MHz
- Power: 300W
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Solid State HF Amplifier

- Power: 250 Watts PEP
- Range: 1.8-30MHz
- Modes: AM/FM/SSB/CW

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HLA 150-Plus+Fans	150w 1.8-30MHz	~~£349.94~~ £299.95
HLA 300 Plus	300w 1.8-30MHz	£369.95

VHF Mobile Amplifiers

KL 144	45w VHF 145MHz	£79.95
KL 145	100w VHF 145MHz	£129.00
VLA 100	100w VHF 145MHz with Fan	£249.00

50MHz Mobile Amplifier

VLA 150	100w 50MHz (6m) all modes	£199.95

MIDLAND

Midland CT-790

Dual Band Transceiver

- Frequency: 144-146 MHz & 430-440MHz
- FM radio receiver
- Modes: UHF-VHF, VHF-VHF, UHF-UHF
- RF power: 5W VHF/4W UHF
- 128 storable channels

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Midland CT-210

VHF Handheld

- Frequency: 144 - 146MHz
- RX with mod (136 - 174MHz)
- 50 CTCSS & 105 DCS codes
- 128 memory channels
- Wide/Narrow 25KHz/12.5KHz

£69.95

Midland CT-410

UHF Handheld

- Frequency: 430 - 440 MHz
- RX with mod (400 - 470MHz)
- 50 CTCSS & 105 DCS codes
- 128 memory channels
- Wide/Narrow 25KHz / 12.5KHz

£69.95

Base Antennas

X30	Dual Band 144/430MHz-150W 1.3M	49.95
X50	Dual Band 144/430MHz-200W 1.7M	59.95
F22	144MHz - 200W 3.2M	79.95

Mobile Antennas

NW-2000	Dual Band Mobile 200W 98cm	29.95
NR-770S	Dual Band Mobile 100W 43cm	24.95
NR-770R	Dual Band Mobile 200W 98cm	24.95

NEVADA - Cable Specialists

Ecoflex 15

100 metre drum	£539
Price per metre	£5.99
PL259 connector (Part: 7350)	£8.95
N type connector (Part: 7395)	£9.95

Ecoflex 10

100 metre drum	£260
Price per metre	£2.89
PL259 connector (part: 7378)	£5.95
N type connector (part: 7367)	£6.50
BNC type connector (part: 7379)	£6.50

Aircell 7

100 metre drum	£179
Price per metre	£1.99
PL259 connector (part: 7390)	£2.65
N type connector (part: 7392)	£5.25
BNC type connector (part: 7391)	£5.25

Aircell 5

100 metre drum	£125
Price per metre	£1.39
PL259 connector (part: 7760)	£2.25
N type connector (part: 7700)	£3.95
BNC type connector (part: 7720)	£3.25

Aircom Plus

100 metre drum	£328
Price per metre	£3.65
PL259 connector (part: 7378)	£5.95
N type connector (part: 7367)	£6.50
BNC type connector (part: 7379)	£6.50

Westflex 103

100 metre drum	£139.95
75 metre length	£112.50
50 metre length	£75.00
Price Per metre	£1.50

RG-213U – Mil Spec

100 metre drum	£116.00
50m length	£64.50
Price per metre	£1.29

RG-213tm – Economy version

100 metre drums	£99.00

RG-Mini 8 (Super XX)

100 metre drum	£59.95
Price per metre	£0.65

RG58/CU – Mil spec

100 metre drum	£39.95
Price per metre	£0.45

450 Ohm Twin Feeder

100 metre drum	£89.00
Price per metre	£0.99

300 Ohm Twin feeder

100 metre drum	£76.50
Price per metre	£0.85

Flexweave Antenna Wire

100 metre drums	£49.95
Price per metre	£0.55

Coated Flexweave Antenna Wire

100 metre drums	£59.95
Price per metre	£0.98

Mil Spec Kevlar Antenna Wire

Very strong, ultra light weight, green colour, as used by the military

100m drum £89.95
Per metre £0.99

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Nevada HF Antennas – Kevlar Wire

Windom	Pro-full Size, 80 - 10, 132ft	£79.95
Windom	Pro-Half Size, 40 - 10m, 66ft	£69.95
G5RV	Pro-Full Size, 80 - 10m, 102ft	£69.95
G5RV	Pro-Half Size, 40 - 10m, 51ft	£59.95

Nevada Pro-high quality baluns

8L-6T	6:1 Balun 1kW (Peak)	£59.95
8L-4T	4:1 Balun 1kW (Peak)	£59.95
8L-9T	9:1 UN-UN Balun (for end fed Wire)	£59.95
DPC-01	High Quality Dipole Centre	£14.95

SIRIO QUALITY ANTENNAS

Sirio HF Base Antennas

Sirio SY27-3	3 El 28 MHz Yagi Beam	£84.95
Sirio SY27-4	4 El 28MHz Yagi Beam	£99.95
SY68-3	3 El Beam for 70 MHz (4m)	£79.95
CX4-68	Vertical Base Ant 70MHz(4m)	£69.95
Tornado	Vert 50MHz 5/8 wave Antenna	£49.95
Vector 4000	Vertical Ant (26-28MHz)	£69.95
2008	Vertical (26-28MHz) 5/8 wave	£69.95

Sirio VHF Base Antennas

SPO-145-5	144MHz vert 5.15 d8i (3mtrs)	£129.95
SA270LN	144/432MHz 5.35/7.95d8i (2.7m)	£99.95
SA270MN	144/432MHz 4.15/6.35d8i (1.78m)	£69.95
SA270SN	144/432MHz 3.15/5.45 (1.3m)	£59.95

Sirio Mobile Antennas – (SO-239)

HP-2070	144/432MHz-445mm-1/4 & 5/8	£29.95
HP-2070H	144/432MHz-1080mm 2 x 5/8	£36.95

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AT588UV

Twinband VHF/UHF Mobile FM Transceiver

- 145/433MHz (2m/70cms)
- Up to 50W adjustable power output
- Full CTCSS/DCS

£249.95

AT-5189

70MHz - 4m Amateur band covers 66-88MHz

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AT-5555 Ver. 6

28MHz All mode Transceiver

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ATT-588

2m (145MHz) 60w transceiver.....£129.95

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Top of the range quality meter with large display

- 1.8-200MHz
- 20/200/2kW

SPECIAL ~~£129.95~~ £119.95

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CN101L

Accurate, easy to read cross needle meter

- Covers HF & 2m
- 1.8 – 150MHz
- 15/150/1.5kW

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More Daiwa

CN103LN	SWR/PWR 140-525MHz..N Type	£79.99
CN801VN	Swr/Pwr 140-525Mhz..N Type	£99.99
CS201A	2 Way Ant Switch..SO239 Type.	£24.95
CS201G11	2 Way Ant Switch N Type.	£29.95

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Nevada PSW-50

40-50 amp Switch Mode Supply

- Input Voltage: 240v Output Voltage 9-15v DC Adjustable
- Current Limiting and Short Circuit Protection
- Large Meter Shows Volts/Amps status

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More Nevada Power Supplies

PS-40M	35-40 amp Linear Supply	~~£139.95~~ £116.95
PS-30M	25-30 amp Linear Supply	~~£99.95~~ £89.95
PS-30	25-30A Switch Mode Supply	~~£89.95~~ £79.95
PS-30H	25-30A Switch Mode Supply	~~£79.95~~ £69.95
PSW-07	Switch Mode Supply	~~£29.95~~ £26.95
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Advanced Wireless weather station for the real enthusiast. Monitors Wind speed, Direction, Temp, Humidity, Rainfall. Highly accurate top of the range unit.

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Fully Featured Wireless Weather Station with new style LCD display panel and Solar transmitter

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- Indoor / outdoor temp °F / °C + Max / Min
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REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

Appledore & DARC
Brian Jewell, M0BRB, 01237 473 251
18 AGM
Bristol RSGB Group
Robin, G3TKF, 01225 420 442
25 Microwave projects, Chris Bartram, GW4DGU
Cornish Radio Amateur Club
Steve, G7VOH, 01209 844 939, G7VOH@btinternet.com
6 Committee meeting
7 Main club meeting
21 Workshop evening
Exeter ARS
Nick, 2E0NRJ, 01363 775 756, info@exeterars.co.uk
4, 18, 25 HF net on 3.675MHz at 19.45
5, 12, 19, 26 2m net on 145.575MHz at 19.45
7, 14, 21, 28 4m net on 70.425MHz at 19.00
11 VHF fox hunting planning meeting in Moose Centre at 19.00 with Keith, G6NBU
25 CW practice, films and videos in Moose Centre at 19.00
Plymouth RC
Rob James, 2E0ONO, robert-james@virginmedia.com
12 Natter evening
Poldhu ARC
Eric White, G0RJH, 01326 564 690, eric.white@talktalk.net
12 A beginner's guide to the Raspberry Pi, G3MCD
Riviera ARC
Alan Wyatt, G2DXU, rivieraarc@gmail.com
1, 8, 15, 22, 29 2m net on 145.425MHz from 8pm
5, 12, 19, 26 Club meeting and MX0RIV on the air 7.30-9.30pm
Saltash & DARC
Brian, M0BHG, 01752 844 321, m0bhg@yahoo.co.uk
7 Talk on Carradon Hill repeaters
21 Club HF rig operating night
South Bristol ARC
Andrew Jenner, G7KNA, 07838 695 471
7 DX Challenge, Tom, M3TWJ
14 Social networking
21 Spring table top sale
28 Open house and on the air night
Thornbury & South Gloucestershire ARC
Tony, G0WMB, 01454 417 048, tonytsgarc@btinternet.com
1, 8, 15, 22 Friday 2m net at 20.00
6, 27 Rally planning meeting
13 On the air
20 GPS investigations, Paul, 2E0PSM
Torbay ARS
Dave, G6FSP, g6fsp@tars.org.uk
1, 8, 15 Natter night and 80m net
22 Presentation and buffet evening
29 No meeting – Good Friday
Yeovil ARC
George Davis, G3ICO, 01935 425 669
7 Members' mini talks
14 DVD: the secret life of radio
21 Simple transmitters, G3MYM
28 On the air

With the latest Foundation licence success on the **Isles of Scilly**, the number of amateurs on the islands has increased by 400%. In the photo, from left to right, you can see Ian, G6BJJ (instructor), Jeremy Russell, George Pearson, Peter Williams, Iain McCulloch, Rhona Holland (EPO IoS Council) with help from Chris, G8RXA (assistant instructor/photographer) and John, M1IOS (island resident not in the photo) for his help with the HF practical work.

After many months of trying to set up and run a Foundation course on the islands, Ian, G6BJJ from SW RAYNET, with the help of the Isles of Scilly Council, Chris, G8RXA and local island resident John, M1IOS, was finally able to hold a successful course in January. The further good news is that there are another five candidates eager and waiting to do the course and hopefully this can be arranged soon.

Congratulations and well done to Jeremy (Jez), George, Peter and Iain.

REGION 12: EAST & EAST ANGLIA

REGIONAL REP: MARK SANDERSON, M0IEO, RM12@RSGB.ORG.UK

Bittern DX Group
Linda, G0AJJ, 01692 218 562, secretary@bittern-dxers.org.uk
28 Club meeting at The Roman Camp Inn, Aylmerton, NR11 8QD, 8pm
Braintree & DARS
John, M5AJB, 01787 460 947
4 Morse evening: keys, programs, on the air
18 Baluns and their construction, Melven, G0EMK
Bredhurst Receiving and Transmitting Society
Charles G4VSZ, 07982 244 788, secretary@brats-qth.org
3 Rainham Rally, doors open 10am
14 Club night, talk on the history of KW Electronics
Cambridge & DARC
Ron, G3KBR, 01223 501 712
1 Pre-rally meeting
8 New club equipment demonstration
22 A modulation gadget, Mike, M0BLP
Coalhouse Fort ARS
Tony Reynard G7HJT, 07976 553 345
31 GB1CHF on the air (11-5pm) for Motor Cycle Day
Colchester Radio Amateurs
Kevan, 2E0WMG, 07766 543 784, kevan2e0wmg@live.co.uk
21 Inter club quiz
Darenth Valley Radio Society
Bob, M0RAW, 01322 663 804, to m0raw-bob@talktalk.net
13 Talk by Keith, G8VJG
27 The secret telephone exchange, Mike Wallace, G8AXA
Dover RC
Pete, M0PKH, peter.halloway@sky.com
6 Antenna analysers, Ian, G3ROO and Pete, M0PKH
13 Natter night
20 Raspberry Pi, Matt, M1CMN and Rob, G4FXE
27 Talk on APRS on 2m and the HF bands, Matt, M1CMN
East Kent RS
Karl Davies, M1DFM, 01227 710 120, karl.davies@talk21.com
4 Talk by Bob MacDonald
18 Club used equipment sale
Felixstowe & DARS
Paul, G4YQC, pjw@btinternet.com
4 Flash, bang, wallop, Colin, M5AEH
18 AGM
Harwich ARIG
Kevan, 2E0WMG, 07766 543 784 kevan2e0wmg@live.co.uk
13 Talk on software defined radio, James, M0ZZO
Hilderstone R&EC
Chrissie Turner, hilderstoneclub@gmail.com
14 Training and construction evening, Patrick Kirkden, 2E0CPZ
19, 21 National Science Week activities at Charles Dickens school
23 Trip to Bletchley Park and National Radio Centre
28 Work of RAYNET, David Townsend, G0WVA
South Essex ARS
Dave, G4UVJ, 01268 697 978, g4uvj@btinternet.com
12 The night sky, Bruce, G1JJS
Thames ARG
Pete Sipple, M0PSX, 07940 579 116
1 Chain Home towers, Andy G1GKN at Jubilee Hall, Canvey Island
3 Club net on GB3DA, 8pm start
West Kent ARS
Keith G4JED, info@wkars.org.uk
11 Surplus equipment sale

2013 got off to a cracking start for **Hilderstone Radio Club** with the first session of the Foundation course having John, G7SXJ explaining the problems of interference and EMC to five eager candidates. This was followed by John, G7OHO using a simple circuit to illustrate current, voltage and power. The meeting proper started with the chairman running through the forthcoming exciting events. Saturday 12 January was the second session of the Foundation course featuring transmitters and receivers, the VHF contact as well as antennas and feeders by Patrick, 2E0CPZ.

On 19 January the club operated from the Ramsgate Lifeboat Station and London Array Wind Farm presented a cheque for £200 to the club for the RNLI.

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On 19 January the club operated from the Ramsgate Lifeboat Station and London Array Wind Farm presented a cheque for £200 to the club for the RNLI.

On 23 March the club will enjoy an outing to the fascinating Bletchley Park and National Radio Centre. The excellent news that the club will be hosting the RSGB100 callsign special event was announced and initial preparations began.

Coalhouse Fort is a Victorian coastal defence fort set in parkland on the north bank of the Thames. A suitable place for family days out, it is currently under restoration with regular guided tours providing excellent views over to Kent and an historic insight to sea and air defence of London. **Coalhouse Fort ARS** are expecting to put GB1CHF on the air on 31 March for the Motor Cycle Open Day. Listen out for the station, particularly HF SSB & SSTV and 2m FM. Visitors are very welcome.

www.coalhousefort.co.uk/web/files/index.html.

In December 2012, **Harlow & District Amateur Radio Society** held a Foundation exam for those members who had completed their Foundation course. Three candidates passed and gained their Foundation licence. In 2013, the club will be running further Foundation courses.

Visitors are welcome to come to club meetings, which are held every Friday evening between 7.30 and 11pm. Tea, coffee and biscuits are available.

Essex Ham is a group that is closely associated with both **Thames Amateur Radio Group** and **Chelmsford ARS**. The hold an informal net on Monday evenings on GB3DA. This net provides a platform for newly licensed amateurs to have their questions answered and help them set up in the hobby. All amateurs are welcome to join the lively debates about various aspects of the hobby. For more information see www.essexham.co.uk/.

Braintree and District ARS held two meetings in January. The first, on the 7th, was a natter night. The evening was used to find out what, if anything, the members had received in the way of radio related Christmas presents. Sadly, none of the members loved ones had come up trumps! The rest of the evening was spent discussing the club diary, forthcoming events and planning started for the RSGB Centenary station at the local shopping centre. The meeting was ended with the last of the mince pies. The second meeting in January, due on the 21st, was a victim of the weather and was cancelled. As everyone was notified by e-mail, a 'club night on the air' was suggested. The used the local club natter frequency (145.375MHz) and started at 8pm. Throughout the evening quite a good number of members called in an many subjects were discussed, some technical and some not so technical and, of course, the weather was one of the topics. It was a good way to make up for a lost club night.

The **Camb-Hams** are planning a US FCC licensing exam session in Cambridge on Saturday 27 April 27th at 2pm. If there are any US citizens, residents, or people for whom the CEPT reciprocity doesn't work (like anyone who is not a citizen of the country issuing their European licence) then this could be the opportunity to get a US call. Details from Martin, G3ZAY, g3zay@btinternet.com.

REGION 13: EAST MIDLANDS

REGIONAL REP: STEVE BODEN, G4XCK, RM13@RSGB.ORG.UK

Derby & DARS
Richard Buckby,
radio@dadars.org.uk
5 Junk sale
12 Committee meeting
19 AGM
26 On the air

Loughborough & DARC
Chris, G1ETZ, 01509 504 319
5 Annual dinner
12 Open forum on radio rallies
19 Video night: Avro Vulcan
26 Practical evening

South Kesteven Amateur Radio Society
Nigel, M0CVO,
01476 402 550
6, 20 Informal evening

In January, **South Kesteven ARS** held their prize giving followed by their AGM. In the photo, the prize winners can be seen happily displaying their trophies. From left to right they are, Stewart, M0SDM who received the SKARS UKAC 70cm Champion trophy, Konrad, M6KVF who received the trophy for most promising newcomer of 2012 and Graham, 2E0GLE who received the

SKARS UKAC 2m Champion trophy. Congratulations to all three of them.

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THINK ITS TIME TO TIDY up your Morse key connections? NEW GOLD PLATED UNIVERSAL CABLETIDYS for most BUG's and PADDLES, VIBROPLEX, JA7GHD,etc 40mm to 60mm spaced connections. See www.g3liv.co.uk email:johnny@melvin.com tel: 0191 2843028

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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

PERSONALISED EMBROIDERED BASE BALL CAPS, Polo shirts and Sweat shirts. With your name and call sign, club logo contact Bill M0WBH at email: billm3wbh@btinternet.com or www.tintagel-crafts.com

MODERN MILITARY SURPLUS. Unused antenna kit designed to survive the North Atlantic. Fernpatch Engineering Ltd. www.yachtradio.co.uk

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YAESU FT1000MP-MV 200W transceiver in excellent condition. I'm now retiring from HF radio. Non-smoker. £1200 ono + plus P&P. Terry, G4XOP 01726 63048 terry.g4xop@btinternet.com Cornwall.

New for 2013. Latest Baofeng UVB5, superb 2m/70cm handie transceiver, including Li battery, base charger, beltclip and strap. See mselectronics.biz for full specifications. ONLY £49.00 each p and p £5.00. Contact MS Electronics 01924 495220

Aerials

8 BANDS 400 WATTS NEIGHBOUR FRIENDLY The Rotary Dual Beam Pro & The I-Pro Home Vertical. Portable DXing-aerial choice is crucial-Knowledge is power, Search: I-Pro Traveller GOKYA "Amazing" Review Contact Carl G4GTW for this months special offers: 01489 789960 www.proantennas.co.uk

M0CVO ANTENNAS for all your amateur radio antenna needs. Full details at: http://www.m0cvoantennas.com

Wire Winders: super for portable, contest and holiday antennas. No more tangled wires! Easy to use. £2.49 each + P&P. www.sotabeams.co.uk 07976-688359.

"WESTERN HF 10" 67ft wire dipole 160-6m, full details lookup m0bzi at: www.qrz.com buy direct: m0bzi@hotmail.co.uk or 07748331458 reviews at: http://g0kya.blogspot.com/2010_08_01_archive.html or http://www.eham.net/reviews/detail/9424

VORTEX ANTENNA SYSTEMS UK Manufacturer and hardware supplier. Delta Loops, Yagis, Monoband and Multiband, OWA Arrays, Bespoke Designs. Antenna parts and mounting solutions. 6082-T6 Metric Tubing, Stainless U-Bolts and much more. www.vortexantennas.co.uk or 07943 871893

G4TPH PORTABLE MAGLOOPS. ML40HP mk11 tunes 40m –15m, New ML20 mk11 tunes 20m-10m full details at: www.g4tph.com

Equipment

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376 email: radiorepairs@btconnect.com

Computer Software

PROGRAMMING CABLES & SOFTWARE FOR YAESU RADIOS Http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

CONTEST LOGGERS - SD by EI5DI. Free and Unrestricted in all RSGB HF Contests. www.ei5di.com

Miscellaneous

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147KHz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

'GITE, VOSGES EASTERN FRANCE at JN28RJ for up to 13 persons. Registered for those handicapped and/or blind. Roman ampitheatre and Mosaic Museum both ½ km. High spot 375m central for tourism (see web-site). Good take off has 2m/70cm colinear plus over 40m space. Visit www.apollon-gite-grand.fr or Tel:00 33 (0) 670 968 765'

PAFOS, CYPRUS. Pafos, 2 bed villa. Simple HF station 300m ASL. www.domsvilla.co.uk. Addiscombe ARC in residence for BERU 2013

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

HOLIDAY WITH YOUR AERIALS! Self-catering, smoke-free twin-bed studio cottage, near the middle of long 3-acre garden. Sleeps 2. Peaceful, electrically quiet rural area. Non-amateur owner OK with (big!) aerials. £250 p/w (Sat-Sat). Diana, 01308 485 301 (W-Dorset).

Cards & Design

QSLERS SPECIAL OFFER till end of January, 1000 full colour qsl cards £47inc postage. 07720 580968 QSLers@aol.com

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.com

"QUALITY QSL CARDS FROM £29/1000, full colour cards from £45/1000. For samples /enquiries /easy payments contact Charles MØOXO, 60 Church Hill, Royston, Barnsley, Sth Yorks S714NG ; Tel 07900 500775 Email charles@m0oxo.com/ Web www.ux5uoqsl.com/

Classified advertisements 58p per word (VAT inc.) with a minimum of 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
Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

Business Cards

For cost effective Business Card advertising call Chris Danby on 01603 898678 to find out more

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FREE MEMBERS' ADS

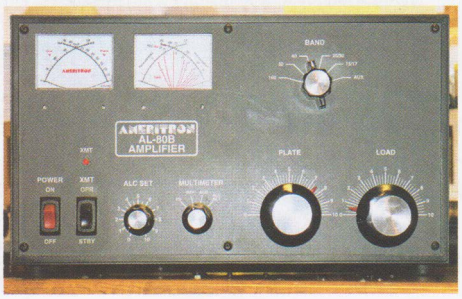
Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 90).

FOR SALE

A HOLIDAY HOME to combat stress – and help Combat Stress! G3PAI's cottage in rural Burgundy. No charge – honest! – just donate to Combat Stress. See www.charity-cottage.org.uk for details.

AMERITRON AL-811 HF linear amplifier, good condition, with manual and original packing, £320. David, G4ERW, 01233 860266, david.lurcook@btinternet.com (Ashford, Kent).

AMERITRON MODEL AL-80B 1,000W PEP / 800W CW amplifier in excellent condition. I am a non-smoker. Prefer buyer inspects / collects or carriage / insurance extra at cost. £550 ONO. Phil, G3SWH, 01934 832 736, phil@g3swh.demon.co.uk (North Somerset area).



BRAND NEW Diamond CR-8900 4 band mobile whip, PL259/SO239 connector, £80. Saphir TSB-3301 (clone of Comet GP-6) 2m & 70cm white stick, length 3.07m, 6.5dB (144MHz), 9.0dB (430MHz), power 200W, never used outside, £80. Collection if possible. Alan, G3VLQ, 01935 422 973, merv.al@btinternet.com (Yeovil, Somerset).

CLARK SCAM 12 MAST, complete with support legs, pump and tools. Buyer to dismantle and arrange own carriage, £100. Steve, G7JCF, 01986 798 524, steve@sboldvic.demon.co.uk (Woodbridge).

CUSHCRAFT MA5B MINI BEAM + rotator, buyer collects, £520. All other items + p&p or inspect / collect. FS-2 dual foot switch, £25. EP-920 PSU, £20. Compaq desktop computer, Win 7, model CQ5226UK (approx 30 months old), excellent condx, £175. Ken Gray, MM0AWJ, 01592 757 831, gm7tyn@gmail.com (Fife).

DRAKE TR7 competition grade HF transceiver with CW filter, MS7 matching speaker, Astatic microphone and PS7 power supply. Full service manual with extender boards. One owner, non smoking environment, little used, £400 ono. John, G3IGV, 0120 873 202, (Cornwall).

EDDYSTONE RXs. IMR 54, £125. 880/2 rack mount, £125. EA12, £295. 940, £100. All with manuals. Collect only from Stratford-upon-Avon. Richard, GM0OGN/P, 01789 293 375 (Stratford-upon-Avon).

FLEXRADIO 1500 SDR transceiver. QRP 160-6m, excellent condition, new July 2012. With leads, *PowerSDR* software and manual, in original packing. Great fun to use. £460 including recorded postage. G4MKR, 07708 744 380, g4mkr@sparkle-wsd.co.uk.

FT-920AFC 100W xcvr in excellent condition, one owner from new, non smoker, £900 + p&p or buyer collects. Kevin, M0VIE, m0vie@tiscali.co.uk (Crewe).

HW-32 AND HW-12 SSB Tx/Rx, £50 each. TRIO 510 PS, U/S, £50. Sommrkamp FLDX-500 SSB Tx, £90. Yaesu FR-101, working, intermittent display, £90. Marconi CR-300/1 LF/HF Rx, £35. AR88LF, £60. FM test No 2, £20. A/C VHF valve Rx, £30. C Young, 01637 875 848, rcry100@yahoo.com (Newquay).

I HAVE A complete set of *RadComs* 1969-1999 free for anyone wishing to pick them up from Aylesbury. Prefer to take the complete lot, not split. Nigel Pritchard, G8AYM, 01296 432 144, nigel-pritchard@o2.co.uk (Aylesbury).

ICOM IC-9100/UX9100, 1200MHz unit fitted, 1yr old, used only 50 hours, Icom IC-E80D dual bander (unused), Comet H-422 4-band trap dipole with 1kW balun, 2yrs old, dismantled, stored. All boxed, with manuals, £3,000 OVNO. Prefer buyer inspects and collects. Alan Nicholls, G0HEL, 01380 871 088 (Trowbridge Wilts).

ICOM IC-R7000 Rx, 25-999.999, 1025-1999.999MHz, AM, FM, NFM, SSB, GWO, inc handbook, £250. Allen, G8YMR, 01684 773 572, a_snow@sky.com (Bredon).

JAYBEAM TB3 TRIBANDER. Unused, original packaging, £250, buyer collects. Nick, G3VNC, g3vnc@uk6.net (Cheddar).

KENWOOD FT-680s HF SSB transceiver inc 50MHz, £250. Collect from Buckingham or will post at cost. Also parts for HF PA (high voltage components). See www.winslowart.org.uk/sale.html for details. Geoff, G3NPI, 01280 812 195, g3npi@btinternet.com (Buckingham).

LDG AT-1000 PRO II with 17 months transferable warranty, no scratches, non-smoker, cost £499, will sell at £350 or exchange and money for a Palstar AT-2K ATU, must be in good condition. MOCVS, 01629 823 025, hamradio12@gmail.com (Matlock, Derbyshire).

MFJ-949E MANUAL TUNER, unused, still boxed. Not required. Buyer collects or will post for charge. £100 ONO. Peter, M0PCC, 07749 755 376, bishoprump@yahoo.co.uk (Croydon).

RACAL BCC-39 HF xcvr VIU, £175 ono. MEL PRC-319 Turf Unit, £80. Turf Extender, £75. All VGC. All + carriage (prefer buyer collect on VIU). Warren, M0WLS, 07831 521 586 (Sutton).

***RADCOM* 1966 TO 2000.** Complete set, all in RSGB Easibinders – excellent condition. Offers? Buyer collects. Ron, G4IZS, ronald.sexton@btinternet.com (Dursley, Glos).

ROHDE & SCHWARZ SCR signal generator, 1000MHz – 1900MHz in four ranges. Up to 19dBm o/p, free running but fairly stable, with vernier frequency adjust. O/p power is continuously variable via vane-type attenuator. Very heavy, £30. Grant, G8UBN, 07881 825 561, g8ubn@amsat.org (Basingstoke).

SHACK CLEARANCE. MFJ 200W random wire ATU model 16010, £30. MFJ mobile HF matcher model 910, £20. Miracle Whip ant for FT817, £50. Wonder Wand ant MK111, £50. Many other bits, please e-mail for full list. David, G0FVH, 01202 383 411, david.dolling1@ntlworld.com (Poole, Dorset).

SK SALE OBO G0UCQ, who died before the equipment was used. Kenwood TS-2000X, £1,550. PS-60, £290. Pro Set Elite 6, £160. FS2 PTT, £35. V-2000, £80. G5RV, £20. MX-2000 triplexer, £60. Poles, wire etc, £180. 2 Morse keys, £30. Alinco DJ-596 Mk 1, £80. Caroline, 01942 740 531, gater.caroline@yahoo.co.uk (Wigan).

TS-850S, owned from new. All filter options fitted, matching power supply and speaker PS52 and SP31, paperwork, no split. Buyer to collect, £750. Bruce, G3WCE, 01692 538 794, g3wce@grimblepoos.co.uk (North Walsham).

TS-930 HF XCVR. Clean rig (non smoker owner), good runner, auto ATU installed but not working. Comes with original box and manual. Downsizing. Preferably buyer inspects and collects. Sensible offers please. Bob Leask, G3XNG, 01234 782 443 (Bedford).

WOUXUN KG-UVD1P 2m/70cm hand portable, hardly used, £65. Has a number of East of England repeaters and some simplex channels programmed in. John Rollason, G3WCO, 01279 876 607 (Chelmsford, Essex).

YAESU FR-50B Rx, £90. LAR HF omni match, £50. Kenpro KP-100 keyer, £80. Katsumi EK-150 keyer, £70. Katsumi MK-1024 memory keyer, £95. Zetagi DL-61 1kW dry dummy load, £80. All in good condx. Nigel, G4KZZ, 01723 890 786, nipro@btinternet.com (Scarborough).

YAESU FT-757GX HF 100W multimode xcvr. Covers 160-10m inc WARC bands. Lovely condition, boxed, complete with Yaesu MH1-B8 hand mic, power cable and manual, £350 OVNO. Prefer buyer collects. Martin Rhodes, G3XZO, 01789 740 073 (Stratford-upon-Avon).

WANTED

AN INFRARED CONTROLLER for a Kenwood UD-501/UD-551M hi-fi system. Model name: RC-MB5 – only! Mr W E Hunt, G0SZX, 01393 423 658 (Exeter).

WANTED FOR RESTORATION AND PRESERVATION. Early valve or spark amateur equipment, ephemera, photos, also RAF, Army wartime communication equipment, accessories, ephemera. Any condition considered. Martyn Wright, G4RLF, 01722 743 270, www.g4rlf.co.uk (Salisbury).

STEPPIR YAGI model DB18E Also wanted Radio Structures mast such as BM30 (at least first 3 sections) or similar mast with a base section of 50x50x50 cm, with a matching base plate. Anton, MW0EDX, m0edx@yahoo.com, 07791 145 923 (Welshpool, Powys).

ICOM IC-756 Pro 2 or 3. Must be good condition. Bill, 2E0BWX, 07577 971 919, bill.ward1001@btinternet.com (Edwinstowe, Notts).

LOWE HF-150 radio case or perhaps a non-working complete radio? Chris, G8BKE, 01425 615143, g8bke@tesco.net (New Milton).

HELPLINES

I am looking for any info on the SAMWELL & HUTTON 'Q' METER Type 45 Sno 139 from around 1960, especially the set up and calibration procedure. Any help very much appreciated; expenses reimbursed. Thank you. Vic, G2CQX, 01743 860 526, QTHR.

RALLIES & EVENTS

2 MARCH - LAGAN VALLEY ARS RALLY – Village Centre, Ballynahinch Road, Hillsborough. OT 11.30, TS, B&B, C, CP. Jim, GI0DVU, 028 9266 2270.

3 MARCH - BRATS RAINHAM RADIO RALLY – Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. TI, OT 10.00/9.30, C. Trevor, G6YLW, 07717 678 795, trev@wig1.co.uk.

3 MARCH - CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB RALLY – Wood Green Animal Shelter, King's Bush Farm, A1198 London Road, Godmanchester, Cambs PE29 2NH. TI S22, CP, OT 10.00, £3. TS, B&B, LB, C, DF, SIG, FAM. David, M0ZEB, 01353 778 093, rally2013@cdarc.co.uk.

3 MARCH - EXETER RADIO & ELECTRONICS RALLY – America Hall, De La Rue Way, Pinhoe Exeter EX4 8PW. OT 10.15/10.30, £2. TS, B&B, C. Pete, G3ZVI, 07714 198 374, g3zvi@yahoo.co.uk.

3 MARCH - SPRING MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, civil, military & vintage radio equipment, vehicle spares & more. Rod Siebert, 01270 623 353, or by e-mail from coldwatr@hackgreen.co.uk [www.hackgreen.co.uk].

5 MARCH - FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB DESKTOP SALE - Friskney Village Hall, Church Road, Friskney, Lincolnshire PE22 8RD. OT 7.00pm (traders 6pm), £1.50, Tables £3.50. Free tea & coffee, raffle. Ian Donnelly, 2E0XOD, 07554 362 020. [www.felcc.com].

10 MARCH - WYTHALL RC RADIO AND COMPUTER RALLY – Woodrush Sports Centre, Shawhurst Lane, Hollywood, nr Birmingham B47 5JW on the A435, 2 mi from J3 M42. TI S22 (V44), CP, OT 10.00, £2.50. TS, C, B&B. Chris, G0EYO, 07710 412 819, g0eyo@blueyonder.co.uk. [www.wrcrally.co.uk].

23 MARCH - LAUGHARNE RALLY – Millenium Memorial Hall, Laugharne, Carmarthenshire SA33 4QG. OT 10am – 2pm, £free, free trader tables and flea market, C. Matthew Twyman, GW6KOA, 01994 427 581 or by e-mail from matthew.twyman63@btinternet.com.

23 MARCH - DUTCH NATIONAL RADIO FLEA MARKET – "Autotron", Rosmalen, just off A59 motorway. TI PI4SHB, 145.500MHz, CP, OT 9.00, €7. TS, FM, C. Details by e-mail from info@radiovlooienmarkt.nl. [www.radiovlooienmarkt.nl].

24 MARCH - DEVON & CORNWALL HAMFEST – The Engine House, Compton Park, Callington PL17 8EA. TS, SES, CBS, SIG, CP, FAM, CS. Dereck, M0YDW, disco5live@btinternet.com.

24 MARCH - LOUGH ERNE AMATEUR RADIO CLUB ANNUAL RALLY – Share Discovery Village, Lisnaskea, Co Fermanagh BT92 0EQ, N Ireland. Access from Erne/Shannon Waterway. OT 11.30, CP. B&B. TS, LB, C, DF. Contact Iain, 028 6632 6693, iain@learc.eu.

7 APRIL - CAMBRIDGE REPEATER GROUP RALLY – Foxton Village Hall, Hardman Road, Foxton, Cambridge, Cambs CB22 6RN. TI, OT 10.00 (traders 7.00), £2. TS, B&B, C, DF. Lawrence, M0LCM, 01223 711 840, rally2013@cambridgerepeaters.net. [www.cambridgerepeaters.net].

7 APRIL - NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION (Blackpool rally) – Norbreck Castle Exhibition Centre, Blackpool FY2 9AA. TI, CP, OT 10.15/10.30. TS, B&B, SIG, MT, LB, C, DF, RSGB book stand. Dave, M0OBW, 01270 761 608, dwilson@btinternet.com. [www.narsa.org.uk].

7 APRIL - SOUTH GLOUCESTERSHIRE AMATEUR RADIO RALLY – Scout Activity Centre, Woodhouse Park, Almondsbury, Bristol BS32 4LX. TI S22 (V44), CP, OT 10.00. B&B, C, CBS. Mike, M1DPB, 07806 310 095, southglosradiorallycoordinator@gmail.com. [southglosradiorally.org.uk].

21 APRIL - WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park Racecourse, Staines Road East, Sunbury on Thames, 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].

This list shows all rallies and events we are aware of as of press deadline. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to gb2rs@rsgb.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e-mail (to gb2rs@rsgb.org.uk) then we suggest you set your e-mail program to request a 'read' receipt so you can be sure we've seen the details. We also recommend you check the details are correct in *RadCom* and tell us if not.

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 P W Davies, G0BHI	1/1/2013
Mr J J Ryan, G0GIS	
Mr A B Sammons, G0HBC	5/1/2013
Mr K N T Ward, G0JUD	1/1/2013
Mr H Wright, G0LKB	
Mr B Eastick, G1AVF	
Mr E Parvin, G2ADR	
Mr A H Wreford, G3EHZ	28/12/2012
Mr J F Cowling, G3HWM	29/1/2013
Mr T J Fishpool, G3KEF	16/1/2013
Mr W J H Eaton, GM3KIG	2/1/2013
Mr J H Ruff, G3MOA	4/2012
Mr W Bryan, G4BMV	26/12/2012
Mr L J Stubbs, G4DBX	11/12/12
Mr J J Wilkins, G4GEA	
Dr F A Delaney, G4GKT	10/10/2012
Mr J T Heesom, G4TQH	1/1/2013
Mrs I Paterson, GM4YNA	14/1/2013
Mr W G Learmonth, G4YZE	13/1/2013
Mr A P Farmer, G6BD	24/12/2012
Mr R J Young, G7ERL	12/2012
Mr D A Holden, G8DPW	8/2012
Mr N Henderson, GI8HXY	21/12/2012
Mr J C Thwaites, G8PWO	
Mr J McCutcheon, M0JMC	
Mr P Creteau, M1FBQ	11/1/2013
Mr C H Lodge, M3YYH	1/2013
Mr D S Faul, VE3TIJ	9/12/2012

OBITUARIES

As part of the improvements to the RSGB website, an obituaries section is being opened at www.rsgb.org/sk and we welcome obituaries from clubs or individuals when someone sadly passes away. Please send submissions by e-mail (only) to sk@rsgb.org.uk. All submissions will be moderated.

SILENT KEY ENTRIES

The Silent Keys column is separate from the obituaries section. To notify the RSGB that a Member has passed away (and their subscription should end and they should be listed in Silent Keys), please e-mail sales@rsgb.org.uk or telephone 01234 832 700 and then select option 1. We will need to know the deceased's name, callsign or RS number and, if possible, date of death.

28 APRIL - 29th YEOVIL QRP CONVENTION – Digby Hall, Hound Street, Sherborne, Dorset DT9 3AA (adjoining the central shopping car park). TI S22, CP, OT 9.30. TS, LEC, B&B, C, DF. Steve, G7AHP, 01803 666 407, steve@g7ahp.co.uk.

6 MAY (BANK HOLIDAY MONDAY) - DARTMOOR RADIO RALLY – Tavistock College, Crowndale Road, Tavistock, Devon PL19 8DD. Free CP, OT 10.15/10.30, £2, TS, B&B, SIG, C, DF. Viv, 01752 823 427, vivwatsondrc@aol.com.

17 – 19 MAY - DAYTON HAMVENTION® – Hara Arena, Dayton, Ohio, USA. CP, OT 8am, $20-$25, TS, huge FM, SIG, DF, LEC, C, CBS, WIN, US exams, FAM, W8BI SES 40/20/10m & IRLP 4267. E-mail international@hamvention.org. [www.hamvention.org].

2 JUNE - SPALDING & DARS ANNUAL RALLY – The Sir John Gleed Technology School, Halmer Gardens, Spalding, Lincs PE11 2EF. TI S22, free CP, OT 10.00. TS, C, CBS. John, G4NBR, 07946 302 815, rally-secretary@sdars.org.uk. [www.sdars.org.uk].

9 JUNE - 12th JUNCTION 28 QRP RALLY – South Normanton Alfreton and District Amateur Radio Club in association with the G QRP Club. Alfreton Leisure Centre, Church Street, Alfreton, Derbyshire DE55 7BD. 10 mins from M1 J28 and the A38. TI S21, OT 10.00. TS, SIG, C, LB. Anya Lawrence, 2E0BQS, 0115 930 7322. [www.snadarc.com].

SPECIAL EVENTS STATIONS

These callsigns are valid for use from the date given, but the period of operation may vary from 1 - 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Details published here are kindly provided by Ofcom.

Date	Callsign	Phonetics	Location	Bands	Keeper
05/03/2013	GB0BFD	Brentwood field Day	Brentwood	L27	G6HHP
09/03/2013	GB5CC	Commonwealth Contest	Isle of Man	LH	G4XUM
23/03/2013	GB1CMR	Clansman Military Radio	Hereford	LHV2	G0PTR

16 JUNE - 26th NEWBURY RADIO RALLY - Newbury Showground, next to M4 J13 in Berkshire. TI S22 (V44), free CP, OT 9.00 (visitors), 8.00 (sellers), £2 visitor, £10 CBS pitch. WIN, C, DF, TS, FM, CBS, SIG. See G7N taking part in the 6m contest. Contact rally@nadars.org.uk. [www.nadars.org.uk].

28 – 30 JUNE - HAMTRONIC SHOW, FRIEDRICHSHAFEN – Messe, Friedrichshafen, Germany. TS, FM, CP, SIG, LB, C, DF, LEC, CS. Large RSGB book stall. [www.hamradio-friedrichshafen.de/html/en].

30 JUNE - WEST OF ENGLAND RADIO RALLY – Cheese & Grain, Bridge Street, Frome, Somerset BA11 1BE. CP, OT 10.00, £2.50. TS, RSGB book stall, C, DIS. Shaun, G8VPG, 01225 873 098, rallymanager@westrally.org.uk. [www.westrally.org.uk].

2 JULY - FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB DESKTOP SALE – Friskney Village Hall, Church Road, Friskney, Lincolnshire PE22 8RD. OT 7pm (traders 6pm), £1.50, Tables £3.50. Free tea & coffee, raffle. Ian Donnelly, 2E0XOD, 07554 362 020. [www.felcc.com].

6 JULY - BANGOR AND DISTRICT ARS RALLY – Donaghadee Community Centre, County Down BT21 0HB. OT 11.30, £3. TS, B&B, SIG. Bill, GI4AAM 02891 816 707, bill.langtry@btinternet.com. [www.bdars.com].

7 JULY - BARFORD NORFOLK RADIO RALLY – Barford Village Hall & Green, Barford, Norwich NR9 4AB, TI S22, CP, OT 9.00 £1.50 (U16s free). C, DF, WIN, TS, B&B. Contact radio@dcpmicro.com. [www.norfolkamateurradio.org].

7 JULY - CORNISH RAC 50th MOBILE RALLY – Penair School, St Clements, Truro, Cornwall, TR1 1TN. TS, B&B, C, TI, CP. OT 10.30, £2. Steve, 01209 844 939, g7voh@btinternet.com. [www.gx4crc.com].

7 JULY - 17th RED ROSE QRP FESTIVAL – Formby Hall, Alder Street, Atherton, Manchester M46 9EY. Free CP, OT 11.00, £2 (U14 free). TS, SIG, B&B, DF, LB, C. Les Jackson, G4HZJ, 01942 870 634, g4hzj@ntlworld.com.

14 JULY - MCMICHAEL RALLY AND BOOT SALE – Reading Rugby Club, Holme Park Farm Lane, Sonning Lane (B4446), Sonning on Thames, Reading RG4 6ST, just off the A4 east of Reading. TI, free CP, OT 9.30, £2. LB, C, SIG, WIN, TS, CBS. Pete, G8FRC, 01189 695 697. [www.McMichaelRally.org.uk].

21 JULY - AMATEUR RADIO IN THE COUNTRY – Upton Bridge Farm, Long Sutton TA10 9NJ. Amateur radio, QRP & homebrew in a country setting. TS, FAM, SIG. Tim Walford, G3PCJ, walfor@globalnet.co.uk.

28 JULY - HORNCASTLE SUMMER RALLY – Horncastle Youth Centre, Lincolnshire LN9 6DZ. OT 10.00/10.30, £1.50, DF, C, free CP. Tables £5, free power. Tony, G3ZPU, 01507 527 835, G3ZPU@yahoo.co.uk.

11 AUGUST - FLIGHT REFUELLING ARS HAMFEST – Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset. BH21 3DA. TI S22, CP, OT 10.00, TS, CBS, LB, C. Details hamfest@frars.org.uk. [www.frars.org.uk].

18 AUGUST - RUGBY AMATEUR TRANSMITTING SOCEITY ANNUAL RADIO RALLY – Princethorpe College, Princethorpe, Rugby CV23 9PX. OT 10am – 4pm, £2, CP, TI, C. Tony, G0OLS, 07759 684 411, rally@rugbyats.co.uk. [www.rugbyats.co.uk].

26 AUGUST Bank Holiday Monday - HUNTINGDONSHIRE ARS RALLY – St Neots Community College, Barford Rd, St Neots PE19 2SH. OT 10.00, £2, TI (S22, V44), CP, CBS, B&B, C, TS, DF. Clive Burchell, G3NKQ, 01480 810 473, clive.burchell@btinternet.com.

15 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. Mike Dixon, 01803 557 941, rally@tars.org.uk.

22 SEPTEMBER - 24th GREAT NORTHERN HAMFEST – Barnsley Premier Leisure Complex, Queens Road, Barnsley S71 1AN or follow the brown Metrodome signs. GNHF in association with SYRG. OT 10.30, £3.50. DF, TS, SIG, RSGB book stall, LB, C, FAM. Ernie, G4LUE, 07984 191 873. [www.greatnorthernhamfest.co.uk].

27 & 28 SEPTEMBER - NATIONAL HAMFEST – brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). Free CP, TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB book stall, RSGB Services & Committees, DF, FM. [www.nationalhamfest.org uk].

11-13 OCTOBER - RSGB CONVENTION – The full convention programme of lectures for all interests will be available on the website later in the year. Principal sponsor Martin Lynch & Sons. [www.rsgb.org/rsgbconvention].

20 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. Jim, GM7LUN, 01896 850 245, gm7lun@qsl.net.

10 NOVEMBER new date - WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park Racecourse, Staines Road East, Sunbury on Thames, TW16 5AQ. TI, free CP, OT 9.50/10.00. TS, FM, B&B, SIG, C, DF, WIN, LEC. Paul, M0CJX, 08451 650 351, info@radiofairs.co.uk. [www.radiofairs.co.uk].

RSGB MEMBERS' ADVERTISEMENTS

RSGB Members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the e-mail address.

2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or Membership number, telephone number and postal town, in that order.**

3) The Ad may not contain more than 40 words, excluding the information in (2), and maybe edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.

4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but Members may re-submit the same advert each month if they wish.

5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in anyway. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.

6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.

7) The RSGB believes that it is inappropriate for Members trading in radio equipment in any way to place Members' Ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.

8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.

9) Members' Ads are accepted and published in good faith.

10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

16 NOVEMBER - HALTON & DISTRICT RADIO AMATEURS RALLY – The Heath Business & Technical Park, Runcorn, Cheshire WA7 4QX. OT 10.00, £1. TS, B&B, C, DF, SIG, cash machine, prize draw. All proceeds after costs to charity. George Low, G0RLF, 07919 935 725 (daytime), by e-mail from g0rlf@talktalk.net or on the internet at www.haltonradiorally.webs.com.

24 NOVEMBER - 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, free CP. Details from Glenn, G4FVL, by e-mail to chairman@catsradio.org.

1 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. Mark, G0GFG, 01388 747 497.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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

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

RSGB MEMBERSHIP

Annual rates from 1 January 2011

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

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

Student (21-25). . . . . Free
Ham Club (under 21). . . . . Free

Subscriptions include VAT where applicable.
Special arrangements exist for visually impaired persons. Details and membership application forms are available from RSGB HQ or see www.rsgb.org/join.

YOUR RSGB

This page provides names and contact details for Board Members, Regional Managers, Committee Chairmen and Honorary Officers. Members seeking advice and guidance on any aspect of Amateur Radio of the Society's work are free to contact the relevant person below. But before doing so, please do check the comprehensive FAQs on the RSGB website, www.rsgb.org/faq/ to see if your question is 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 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 Hosey, MI0MSO,
e-mail: rm8@rsgb.org.uk
Region 9 – L Smith, G4OXY, e-mail:rm9@rsgb.org.uk
Region 10 – M Senior, G4EFO, 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 – S Boden, G4XCK, 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, M0JAV, 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
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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 read the advice. www.rsgb.org/tutors/pdf/good_operating_practices.pdf & www.rsgb.org/operating/ethics/docs/ethics_and_operating.pdf

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

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

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

WEBSITE

Main website: www.rsgb.org
Members Area: www.rsgb.org/membersonly

Log in using your callsign in lower case as the user name and your membership number, without the leading zeros (see your *RadCom* address label) as the password.
If you need to update your membership details, please visit www.rsgb.org/amend.

BEACONS

Martin Harrison, G3USF

I would be grateful if you could find space to correct and amplify a passage in my article on beacons in the February 2013 *RadCom*. The pioneering GB3IGY beacon operated from Well Hill between March 1958 and March 1959. Its successor, GB3VHF, opened at Wrotham in 1960, relocating to Fairseat in April 2010. For a fuller record see www.g0afh.com/gb3vhf/GB3VHFhistory.html.

CAN SOMEONE SOLVE A MYSTERY?

Roderick Williams, GW8YPR

I shall try to keep this letter short, but it surrounds the mysterious disappearance of G(W)4PQE from the airwaves some ten plus years ago. I got to know Eric Clayson many years ago when he was living in Hele Bay, Ilfracombe. In those days he was into 2m FM. I lived in Talgarth to the east of the Brecon Beacons, where I still live. I could get a signal to Ilfracombe by firing my beam antenna over the peaks of this range of mountains that were some 13 miles away. Likewise, Eric could put an end stopping signal into my shack on just a few watts or less. Eric also used to hook up with the Welsh radio hams in the coal mining valleys, many of whom I could not get a signal to.

Eric visited me on at least two occasions and got a liking for Wales and he eventually up sticks and came to live on this side of the Bristol Channel. Because of this I actually lost touch with him unless I caught up with him via the West Wales 2m repeater on the rare occasion. I know he moved at least twice, possibly three times, whilst in South Wales. He was into working 80m and kept in touch with the radio amateurs around Glyneath and Swansea, his old 2m friends. Then one day no one ever heard from him again. I contacted the lads around the Neath area who remembered my days on 2m and they asked me whatever happened to Eric.

I even had a recent enquiry via e-mail asking if I had found out where Eric went? All they could tell me he was last heard of living at Talley near Carmarthen, I even contacted the vicar there a few years ago who was helpful but after a few weeks he drew a blank after asking his parishioners.

So there the story ends but I just wondered if someone somewhere knows whatever happened to G4PQE? If he had moved on I am sure we would have heard him on 80 looking out for the Welsh nets. The sad conclusion is he may be silent key.

IT'S RADIO JIM – BUT NOT AS WE KNOW IT!

Lionel Sear, G3PPT

The HF bands are facing an inexorable rise in pollution from digital sources to the extent that ham radio for some in built up areas is becoming impossible or at best severely impaired. However, the digital age might just offer limited succour for those so afflicted.

Those who have visited the wide band WebSDR internet site at the University of Twente* will have been impressed by the facility that allows 256 simultaneous listeners to tune anywhere in the spectrum from VLF to the 10 metre band.

This suggests to me that it would be possible to set up simple HF receivers in quiet spots that are free from noise pollution but that have an internet connection and friendly farmers may be able to help here. I would suggest that it would be feasible for the audio bandwidth of, for example, the QRP or narrow band digital modes section of one of the HF bands to be streamed up to a website and thus be made available for reception on a simple internet facility that could be as simple as a cheap Android device. Two to three kHz of bandwidth would allow a considerable number of simultaneous QRP CW or digital mode QSOs.

By this means it would be possible to transmit from a noisy location and receive via a quiet one. Much of the self education and satisfaction derived from experimentation with equipment and aerials would still be in place.

The reception facility would have to be located close enough to the user so as not to be subject to propagation differences.

I can see no obvious licensing constraints with the internet approach. There is another possibility whereby the audio could be retransmitted for local use on one of the VHF/UHF bands but this might be much more contentious and licensing would definitely be an issue.

*http://websdr.ewi.utwente.nl:8901/

NEW USERS – M6 CALLS

Ray Stewart, M6FAX (and proud)

A lot of older amateurs seem to me look down on the lowly M6 calls. I have heard them say on air, "Oh a 'Lucky Bag' callsign. I had to do this and that to get mine; they give 'em away now". However, the Halifax and District Radio Society are to be applauded for running a newly licensed members net on a Wednesday night from 7.30pm.

More radio clubs should be encouraged to do this then a lot of recently qualified amateurs would be happier using the bands. I think a lot of them are somewhat afraid to get on the air for fear of sounding daft and inexperienced, only to have some crusty old callsign berating them for bad operating practice. Come on people, we all need to learn. Give us a chance. Oh yes, by the way, I'm 60 this year so not a young lad, just young at heart – and I am studying to take my Intermediate exam.

You make a very valid point that everyone had to begin somewhere and that the Foundation Licence is a first step on what will hopefully be a lifetime of learning and development in amateur radio. We need to encourage more initiatives such as the one you describe by Halifax and District Radio Society and it is encouraging to see more clubs in the Around Your Region calendar offering M3 and M6 nets. Club nets are also an ideal way of encouraging those who are only just coming back into the hobby after a long break.

Graham Coomber, G0NBI, RSGB General Manager.

WAB ON 2m

John Fitzgerald, G8XTJ

Two metres is mighty quiet these days unless you count the Activity Contests on the first Tuesday of the month and a few big RSGB contests. I do all my WAB collecting on 2m as I started in the halcyon days of the 1980s when it could be difficult to find a clear frequency on SSB in the evenings. Those were the days when the late and much lamented Bob, G1SMI went out mobile with an eight-element quad on the car roof, which he rotated by turning the car round! Many of us were collecting in those days with the leaders being Roy, G1NUS, G6GNW, G1EUU, G1SMI and G6XLL. The leaders collecting from home were the aforementioned Laurie, G6XLL, G6UMP, G1DMS and G8XTJ, who all worked 2000 areas or more from home.

I had never claimed an HF award until last year when I claimed the Follow the Torch Award as I was unable to get even the Basic on 2m.

It is all much more difficult nowadays as there is much less general activity on 2m for a variety of reasons. It is useless to whinge about the changed licensing requirements but they have made a big difference. Some SOTA activations are on the band but many are FM only (not a mode I use) and some complain that they can get no contacts on SSB on forums. If you ask them what they are using they say a vertical. It seems to me that perhaps instructors are not explaining that SSB contacts on 2m are horizontally polarised, perhaps because the instructors have never been on the band themselves. Maybe we should campaign to get this include in the syllabus? Of course, there are plenty of experienced SOTA men activating on SSB, especially G4ERP and G4OIG.

Anyway, this is a commercial for those of us collecting on 2m, who include G2BOF, G4JZF, G0RQL, G0TRB, M6WSB and M0JDK. Incidentally Laurie, G6XLL is still collecting historic areas, mainly in GM! There may be others but these are the most frequent recent claimants on VHF.

I would like to invite all WAB enthusiasts with 2m facilities to come on the band during 2013. Perhaps the RSGB Centenary Award will bring some activity otherwise working 15 new areas a month for a minimum of 10 months for the Calendar Award will be difficult.

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.

How can you help? Come on the air on the one remaining net on 144.345MHz SSB at 8.30pm on Friday or 10.30am on Sunday where you will often find G2BOF, G6XLL and G8XTJ. This frequency is not monitored at other times unless we are notified in advance. Please e-mail us or use the Yahoo reflector to announce activity. If you are a club station operator in one of the RSGB contests make sure all operators know the WAB square as well as the locator. Come on in the WAB VHF contests and the RSGB activity contests to give away your square. Encourage SOTA SSB stations to use horizontal polarisation.

Incidentally, I do make a point of turning up on the HF nets when I can to give away my square and book numbers for those collecting for winter activity and other timed awards. My thanks to Brian, G0BFJ for coming on in the activity contests – I will work him one day!

We look forward to hearing you on 'Two'. Perhaps someone will show interest on 'Six' again.

Happy WAB collecting in 2013.

ANTENNAS IN THE ATTIC

G3MFO

Reading the letter in the February 2013 *RadCom* on antennas in the attic by G0VIE, I would like to pass on my experiences. Prior to my move to Hopton near Bury St Edmunds in Suffolk 9 years ago I had good outside antennas, but after moving I found out that I was unable to erect any form of poles or masts and did not have any trees in a small garden to hang any antennas on. My current antenna for the LF bands is a 126 foot doublet running round my garden fence at only 6 foot 6 inches high fed with 300 ohm slotted ribbon, which is fed back to my ATU via 4:1 balun. This was featured in June 2011 *RadCom*. It works reasonably well considering its height. So not being able to fix up any other antennas outside I decided to go into the attic. I decided to make up a series of dipoles for 14, 18, 21, 24 and 28MHz feed with a common 75 ohm twin feeder. The eves of my roof are 34 feet long, and from ground level are approximately 17 feet high (being in a bungalow). This was a ideal length for 14MHz. Using this as a supporting dipole I hung the other dipoles for 18, 21, 24 and 28MHz beneath it, spacing each dipole by 2 inches using 0.5 inch plastic pipe to separate the wires, and bring the twin feeder down into the shack to 1:1 balun and a short coax cable to my ATU. I then went about setting up each antenna to resonate in the middle of each band using an antenna analyser. Results were encouraging despite the orientation of the antennas, SE/NW, which made state side contact a little difficult. However, I get out around the Far East and into Europe very well on most bands. I run 400 watts into these antennas without any interference problems. It's worth a try if you, like me, have restrictions as it is surprising what you can work with the antenna being under the tiles.

WOT NO HT? – AN ELMER SAGA

Graham, G4FUA

I have just returned from the last of many visits attempting to repair a radio for a 98 year old man living out in the sticks near Wooton-under-Edge (Gloucestershire).

Cedric has an extremely old Cossor radio that he assures me was built from a kit (?) and will not let it out of his sight. It is housed in an oak cabinet with a lift-up lid. It has three valves of the 4/5 pin 2V type with no identifying numbers and 5-pin plug-in coil sets. On the front panel it has two tuning controls; these are labelled 'Aerial' and 'Detector'. No speaker, just S G Brown 4kΩ headphones – and no circuit diagram, of course. This is a TRF with a regenerative detector.

Here's my downfall, well very nearly: when I first arrived to look at it, I spotted the lead-acid accumulator and a grid-bias battery, but no 120V HT battery in sight. I ask him where he kept it (thinking he had an 'eliminator' stashed somewhere) and he said "Ah, that be that gas *thingy* in the cellar"! Sure enough there were 4 wires going through the window-frame, he pointed out the Aerial and Earth then the red-black, cotton covered, twisted pair and said "that be the High Tension". He led me down to the cellar (no lights, just a torch) and pointed to the corner. "That's the HT generator." *Generator?*

To cut a long story short and not linger on the shocks that it gave me; I have to ask, have you ever heard of a Milnes-Unit? – that's what he called it. It consisted of a cast-iron frame with ceramic bars supporting many rows of (what looked like) a hundred or more thermo-couples, each with tiny yellow flame under it. Many of the individual flames were either 'out' or diverted by corrosion debris. Oh yes, I forgot about the *perished* red rubber pipe coming from a *science-lab style* gas-tap – it crumbled to powder on touch…

For a few moments I contemplated cleaning it up, but realised it would never be 'approved' by any gas engineer. After much muttering and moaning from Cedric and further assurances from me that it really was beyond safe repair, I made a rash promise: to build him a mains power supply. Well, I had built them before… but will I never learn?

I returned a week or so later with a custom-built 2V / 7.5V / 120V PSU, decommissioned the Milnes-Unit and batteries and connected the new PSU. The radio sprang into life on medium wave; the voices from the headphones and the grin on Cedric's face made it all worthwhile. I dusted myself off and packed my tools and the Milnes-Unit into the car, leaving a happy Cedric listening – in a world of his own. Cedric's lad asked what he owed me, but I told him it was just so good to see how happy Cedric was. He thanked me and I left. But then… the following week, Cedric's lad (69 – same age as me) called me to say his dad reckoned the radio was picking up a lot of interference and he was having trouble trying to listen anything, also he could not get the Radio Bulgaria English service at all.

I returned and checked out the aerial and earth, cleaned all connectors, lowered the long-wire, wiped the grot off the insulators, replaced the rotten halyard (which had broken as soon as I touched it) and re-hoisted the antenna. After a couple of hours work it was no better! Cedric reckoned "It's that new-fangled power-supply of yours" – Oh [mutter] could he be right?

I had another PSU back home, part built; I finished building it and fitted in a larger case. I added a high quality mains RF filter input-socket and extra RF filters/ferrites on all outputs. I tested it on an old radio of similar vintage – he was right; my own radio was much quieter with the new PSU [more muttering]. I so hate messing up like that.

I returned to Cedric's that afternoon and fitted the new PSU. "So much better" was Cedric's verdict. But when he changed the coil-set, his response was, "still no Radio Bulgaria". This was when I had to break the news to him; while his radio had been unusable, BNR (Radio Bulgaria) had ceased their English (and other language) World Service on short wave. I told him that I also used to enjoy the late-night listening.

I don't think Cedric believed me, but when I returned home and checked on the internet – I found the announcement. Radio Bulgaria had actually ceased all short wave transmissions in February this year (2012). I printed out the announcement and sent it to Cedric's lad in the post.

Only now do I recall my personal motto: "Never volunteer for nut'in!"

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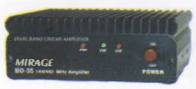

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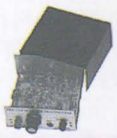

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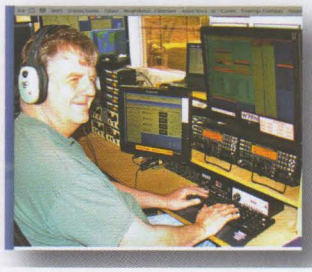

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