RadCom

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

NOVEMBER 2010
VOLUME 86
NUMBER 11

£4.25

That's Handy

New 2m and dual-band handhelds from Icom

1110

SPORT RADIO

Report on the ARDF World Championships

IOTA CONTEST

IT9EJW/P on the air from Lachea island, EU-166

EARTH OBSERVATION

Live images from space

SMD SOLDERING

You can hand-solder chips this small – we show you how

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YAESU

UK's Largest Stocks

NEW FT-DX5000 Series

The new FT-5000 series of transceivers has arrived. Available in three flavours, This new range embodies many features developed by Yaesu for their top range models - all with 200 Watts output!

FT-DX5000	Basic Transceiver HF-6m 200W	£4999.95 D
FT-DX5000D	With Station Monitor SM-5000	£5349.95 D
FT-DX-5000MP	With Station Monitor & Roofing Filters	£5799.95 D

HF Transceivers

Ask About Part Exchange Deals!

FT-2000	100 Watt 160 - 6m "Industry Standard" Rig	£2299.95 D
FT-2000D	200 Watt version of FT-2000 with built-in PSU.	£2899.95 D
FT-950	100W HF - 6m transceiver with DSP & Auto ATU	£1289.95 D
FT-450AT	100W HF - 6m with automatic ATU & latest updates	£699.95 D
FT-450	100W HF - 6m transceiver - great value.	£619.95 D
FT-DX9000contest	200W HF - 6m "formula one" contest machine	£4899 D
FT-DX9000D	Deluxe fully loaded base station	£8199 D
FT- DX9000MP	Amazing 400W "legal limit" radio	£8999 D
FT-857D	HF to 2m mobile. portable or base - up to 100W	£659.95 D
FT-817ND	HF - 70cms 5W all-mode transceiver	£499.95 D
FT-817BHIDSP	Fitted with DSP module exclusive to W&S	£599.95 D

VHF Mobiles & Handhelds

FTM-10SE	50/40W 2m/70cms stereo FM Mobile	£299 D
FTM-350E	Blue Tooth/GPS 2m/70cms FM Mobile	£529 D
FT-1900E	*NEW* 2m Mobile 65W	£129 D
FT-2900E	*NEW* 2m Mobile 75W	£139 D
FT-7900E	*NEW* 2m/70cm Dualband Mobile 50/45W	£229 D
FT-8800E	Dualband Mobile 50W / 30W	£299 D
FT-8900R	10/6/2m & 70cm Mobile	£359 D
VX-3E	2m / 70cm Handheld Wideband receive	£149 D
VX-8DE	*NEW* Triple band 6m-70cms APRS etc	£389 C
VX-7R	Waterproof dualband handy (silver / black)	£279 C
VX-6E	2m/70cms handy, 5W Wideband Receive	£229 C
FT-60E	2m/70cms, 5W handy Wideband Receive	£169 C

FTM-350E

* *Bluetooth Ready*
* *Built-in Barometric Pressure Sensor*
* *Large Dot Matrix Display*
* *Selectable Eight Colour Display*
* *Extended Receive*

VX-8DE *NEW*

Triple Band Transmit 6M 2M and 70cms with 5W FM transmit power and 1W AM power plus wide Band receive from 0.5 - 999.90 MHz The VX-8D is a technological break through with Bluetooth Hands free operation with GPS/APRS and Real RF Dual wideband Receive. technology for decades.

FT-857D Best HF Mobile?

* *160m - 70cms*
* *Detachable head*
* *100W (to 6m)*

With a price tag of £659, this had to be the best HF mobile buy! Mobile, portable or even base - there is no competition!

Wuoxon KG-UVD1P

2m & 70cms Transceiver

NEW

A 5 Watt 2m & 70cms handheld with DTMF, CTCSS and DCS. Also has WFM broadcast. This keypad entry radio with LCD display is supplied with LI-ion battery and AC charger.

£89.95 D

West Mountain

Rigblaster PLUS The standard for an automatic switching interface. Your mic always works, no manual switching, no unplugging. USB operation.

£159.95 C

Rigblaster Pro Complete system designed to perfectly integrate PC & radio. Whatever the mode, this will provide the answer. Inc a complete set of leads.

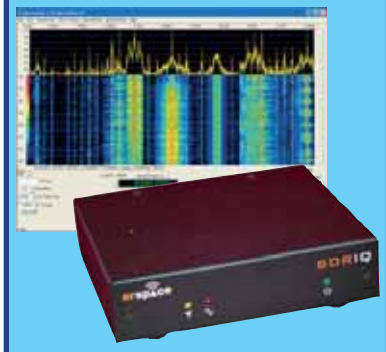
£279.95 C

SSB MastHead PreAmps

Range of high performance mast-head pre-amps with optional coax DC feed boxes. 6m - 13cms. Phone for prices.

RFspace SDR-IQ

Advanced Receiver Tunes down to 100Hz!



If you have been pondering about buying into SDR receiving, this design may be just what you have been looking for. Its ultra LF reception gives you the opportunity to explore a wide spectrum and the panoramic display gives great visual indication of activity. Just pllug into PC USB port - it is self-powered for easy setting up.

We are now employing RF Space SDR receivers for a military contract which is at present undergoing trials - testimony to RF Space design and performance.

£469.95 D

Pro-Set-Elite-6 *NEW*

The ProSet-Elite 6 uses the new HC6 element that is ideal for the latest transceivers with DSP tx audio EQ. Heil have published a list of recommended EQ settings for many popular radios.

Designed in the style of previous ProSets, you get dual headphones & adjustable boom mic. You need to add the appropriate AD-1 adaptor lead. Tell us your radio and we will supply correct one.

£179.95 C

For Icom radios, ProSet-Elite-IC is available. You get the same functions but element is matched for Icom. £189.95 C

ProSet continues for those who don't have EQ in their radios and is offered at a great price.

ProSet-4 or 5 £114.95 C
This is fitted with HC-4(DX) or HC-5 (Normal) insert. Needs AD-1

ProSet-Plus £189.95 C
This has dual inserts switchable

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

KENWOOD

NEW

TS-590S W&S are pleased to announce the new HF radio from Kenwood.
Expected November £TBA

HF Transceivers

TS-2000E £1489.95 D

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

TS-2000X +23cm £1749 D

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

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

Handhelds

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

VHF Mobiles **TM-V71E** £289.95 D

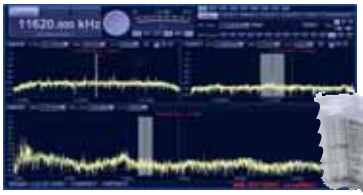
2m/70cm Dualband Mobile Transceiver. Features;- *Wideband Receive, Built-In Echolink, Simultaneous 2 Frequency Receive, Removeable Control Head, CTCSS Encode / Decode, 1000+ Memories, DTMF Mic.*

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

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

WiNRADiO® WR-G31DDC "Excalibur"

Receiver 9kHz - 49.995MHz **NEW**



"It out-performed my 100dB HP Spectrum Analyser"

Voted NEW "Number One" in RSGB Review

Meet the new industry standard receiver for serious HF work. Just plug into your PC USB port for a new experience in sensitivity and dynamic range. No hardware design can match the way that signals are extracted, demodulated and both visually and audibly re-produced. Serious DXer or casual operator, you will be amazed.

£649.95 D

NOW IN STOCK!
NEW AIRNAV RADARBOX-3D

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

Full Package **£489.95 C**

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

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

MicroHam Interfaces

microKEYER

Multimode USB Interface gives you radio control, dual-channel USB sound card, hardware FSK, digital voice keyer, improved WinKey CW keyer, true all mode operation, unparalleled auxiliary control.

£229.95 C

MK2R+

Two radio Controller gives you radio control, hardware FSK, flexible receive audio switching, digital voice keyer, WinKey 2 CW keyer.

£699.95 C

Diamond
Switch Mode Power Supplies

New Lower Prices!

GSV-3000

**Output voltage: 1 - 15V DC*
**Output current 30A continuous*
**Built-in cooling fan*
**Supply 230V AC 50Hz *Weight 9kg*
**Size 250x150x240mm*

£199.95 D

GZV-2500 **£139.95 D**
Output 25A, 5-15V DC, supply 230V AC
Switch mode over volts protected.

GZV-4000 **£189.95 D**
Output 40A, 5-15V DC, supply 230V AC
Switch mode over volts protected.

GZV-6000 **£369.95 D**
Output 60A, 1-15V DC, supply 230V AC
Switch mode over volts protected.

Ameritron Amplifiers USA Manufactured

AL-811XCE 600 Watts
3x 811A 230V AC.
£899.95 E

AL-82XCE 1.5kW QSK
2 x 3-500Z 230V AC.
£2729.95 E

AL-800HXCE 1.25kW QSK
1 x 3CX800A7 230V AC.
£3179.95 E

AL-1500XCE 1.5 kW
1 x 3CX1500 230V AC
£3469.95 E

ALS-500MXCE 500W
Solid State 12V @ 100A.
£949.95 D

Exclusively Imported by Us
Ameritron amplifiers are rugged with typical USA engineering. Valves still give more watts to the £ and lower distortion.

VIBROPLEX UK Distributors

V-CM A compact straight key with super movement.
£59.95 C

V-CW High quality iambic key in the style of Vibroplex
£149.95 C

Watson
Cross Needle Meters

NEW

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

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

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

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

Quansheng
Dualband Handheld

TG-UV2

NEW

The TG-UV2 is a dual band 2m/70cm handheld. It covers 136.00 - 173.995 - 400 - 469.995MHz & FM broadcast 88-108MHz. The radio includes 7.2V 2Ah Li-ion battery for extended life.

** 3 Power Levels: 5W / 2.5W / 1W * Steps: 5, 6.25, 10, 12.5, 20, 25, 30, 50 & 100kHz * CTCSS, DCS & 1750Hz Tone * Dual Watch * 200 Memories Alpha Numeric * 2 Deviation Levels * 2 Bandwidths * CTCSS & DCS Scan * Built-In LED Torch * Backlit Screen * PTT or VOX*

£79.95 D

Radio Works
Carolina Windom Ants

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

All windoms include WARC bands

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

Baluns

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

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

MFJ-998

W&S £649.95 C

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

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

MFJ-929

AUTO TUNER 1.8-30MHz 200W

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

W&S £209.95 C

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

MFJ-112B

World map clock.
Was ~~£32.95~~ Now £22.95 A

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

Butternut
Vertical Antennas

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

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

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

WATERS & STANTON

General Enquiries

01702 204965

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Online Catalogue

www.wsplc.com

Present

ICOM

Part Exchange that Old Radio - even dead ones!

That's right - we will even take ham radio items that are faulty or dead! With the coming VAT increase it makes sense to buy now and at the same time turn your unwanted ham radio gear into cash you set against the price of your new Icom radio. Just call us on **01702 203353 (Hockley) or 0845 5050128 (Scotland)**

IC-7600 *Transceiver*

The IC-7600 HF/50MHz transceiver is enhanced with some of the main features tried and tested on our flagship IC-7700/7800 models, highly regarded by Amateur operators world-wide. Add over 45 years of analogue RF circuit expertise and the result is the IC-7600, a new rig with outstanding performance and a multitude of innovative features including a newly employed double conversion superheterodyne system and dual DSP units and 3kHz IF (roofing) filter.

£3379.95 D

IC-7200 *Transceiver*

The IC-7200 HF/50MHz transceiver maintains all the traditions of high quality engineering that you expect from Icom. Rugged in design and easy to operate, the IC-7200 utilises the latest digital functions including digital IF filter, twin PBT and manual notch filter which are normally associated with more expensive models. The IC-7200 is ideal for field operation or at home in your shack and is designed to be one of the most practical rigs available.

£799.95 D

IC-7700 *Transceiver*

* *1.8 - 50MHz*
* *20W Output*
* *3 x Roofing Filters*
* *Dual AGC Loop*
* *7" Colour Display*
* *Dual USB Ports*
* *4-Way Antennas SW*

£5499.95 D

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

IC-7000 *Transceiver*

In your home or on the move, this radio is ideal for any occasion. The IC-7000E pack so many features and so much power into such a small space. HF-6m 100W, 2m 50W and 70cms 35 Watts. You get dual processors, multiple AGC loops, Twin pass band tuning, Digital IF filtering and Dual notch filters. You also get an extraordinary large and crisp colour display.

£1089.95 D

IC-E92D *D-Star Ready*

The IC-E92D is a waterproof dual band transceiver. The IC-E92D is ideal for D-STAR enthusiasts, active amateurs who are fans of outdoor pursuits or organisations that are looking for a simple GPS position reporting system.

The IC-E92D provides waterproof protection, equivalent to IPX7. If used with the optional HM-175GPS, the IC-E92D provides GPS position reporting functions in DV mode; GPS functions are fully compatible with the IC-E2820 series.

£369.95 D

IC-718 *Transceiver*

Aimed as an entry-level product, the IC-718 continues all the traditions of high quality engineering that you would expect from Icom. Conveniently sized and easy to operate, the IC-718 utilises all the latest RF and digital technology and is designed to be one of the most practical rigs ever! The IC-718 offers an excellent overall specification coupled with ease of use.

£519.95 D

IC-7800 *Transceiver*

* *1.8 - 50MHz*
* *20W Output*
* *3 x Roofing Filters*
* *Dual AGC Loop*
* *7" Colour Display*
* *Dual USB Ports*
* *4-Way Antennas SW*

£7999.95 D

A fusion of forty years analogue RF circuit development expertise, with cutting edge digital technology. The result is 110dB dynamic range, +40dB 3rd order intercept point in HF bands and other phenomenal performance features. 200 Watts output and +40dBm IP3.

ID-E880 *Transceiver*

The ID-E880 is designed to be easy to use and contain a new 'DV mode' feature which allows the operator to access D-Star repeaters in just two steps. The ID-E880 mobile is the successor to the ID-800H mobile. 50W dual bander with GPS capability, Airband receive etc.

£429.95 D

IC-E2820 *Transceiver*

The IC-E2820 dual-band mobile transceiver includes popular features such as VHF/VHF, UHF/UHF simultaneous receive capability, wideband receive, independent tuning knobs and a separate controller. In addition to this Icom has introduced new features including diversity receive capability, a full dot-matrix display and 50W output power in both VHF and UHF bands, all in one stylish mobile set.

£424.95 D

IC-E80D

VHF/UHF dualband, D-Star transceiver. The IC-E80D is designed to be easy to use and contain a new 'DV mode' feature which allows the operator to access D-Star repeaters in just two steps on Icom site.

£314.95 D

IC-E90

The IC-E90 multi-band handheld transceiver covers 50MHz, 144MHz and 430MHz bands and is equipped with a wide band receiver, which covers 0.495-999.990MHz in AM/FM/WFM modes.

£234.95 D

Other Radios

IC-910H Dualband + Optional 23cm Satellite Trnscvr	£1249 D
IC-910HX Dual Band + 23cm Satellite Transceiver	£1449 D
IC-2200H 2m FM mobile 65 Watts	£199.95 D
IC-R3 Scanner with TFT Colour Display	£385.95 C
IC-R6 Handheld scanner 0.1-1309.995MHz	£174.95 C
IC-R20 Scanning Wideband Receiver	£389.95 C
IC-R1500 Comms Rcvr 0.01-3299.999MHz	£449.95 C
IC-R2500 Dual Communications Receiver	£569.95 C
IC-R8500 Comms Receiver 100kHz - 2GHz	£1379.95 D
IC-R9500 Comms Receiver 0.005 - 3335.000MHz	£9999.95 D

IC-T70E *2m/70cm Handheld* NEW

The IC-T70E VHF/UHF dualband handheld transceiver is the successor to Icom's best selling IC-T7H. It has many impressive features including 700mW loud audio, long-lasting power, rugged construction, plenty of memory channels, all at a competitive price. In short, the IC-T70E offers practical dual band operation & ruggedness, updated for today's radio enthusiast

£159.95 D

IC-9100 NEW

VHF/UHF Satellite + HF + D-Star

100W on HF, 2m 75W on 70cms & 10W on 1296MHz.

Due In October!

£TBA

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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

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

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

Icom's new rugged IC-V80E and IC-T70E FM handhelds reviewed on page 70.

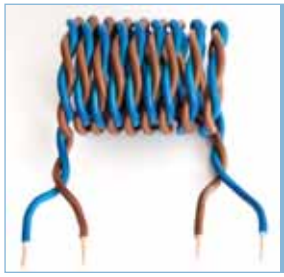
Photo: Icom UK.

News and Reports

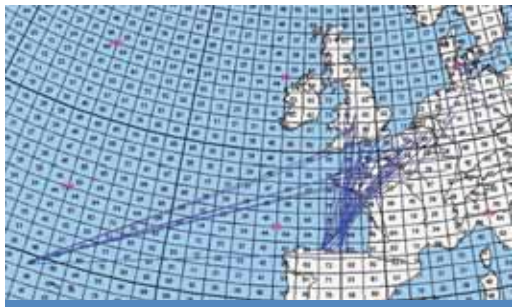
G4OBK/p operating in the 2010 RSGB NFD – see P16

Reviews

Features



It's a transformer… Design Notes, P58



Tropo opening to the Azores on 13 September – P52

Technical Features

24GHz portable – GHz, P54

Regulars

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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

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

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

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B Reay, G8OSN
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A Johnston, G8ROG - Region 9
G Keegan, G6DGK - Region 10
P Helliwell, G7SME - Region 11
P Brooks, G4NZQ - Region 12
J Stevenson, G0EJQ - Region 13

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

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

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

"We have all got to share the load"

Taking the headline from a recent government announcement, "We have all got to share the load", the Society has had to make the difficult decision to raise subscription rates by £3 across all grades from 1 January 2011. We are greatly aware of the financial pressures that we are all under during these recessionary times, however, for the RSGB to maintain the services that it provides to its members at the same level this rise is very necessary. Over the past few years the RSGB been increasingly more active in representing the interests of radio amateurs, be it with Ofcom or the UK government but also at European and World level. This has been necessary to ensure the maintenance of the spectrum allocation we enjoy, the protection of our spectrum plus negotiations to get more spectrum. Recent successes at 7MHz, the introduction of Special Contest callsigns, the continuing allocation at 5MHz lay testimony to this. You will have read in the pages of *RadCom* of our fight against the interference caused by the introduction PLA/PLT devices, all of this work bites into our income. The production of *RadCom*, recognised as the best Amateur Radio magazine in the world does not come cheap and is a key part of the membership provision. *RadCom* provides the very best articles and news, over ninety pages every month and, despite increasing costs, it is the Society's intention to continue to improve *RadCom* at every opportunity. Alongside of this you continue to enjoy the best advice available should you encounter any problems in the pursuit of your amateur radio hobby, and you have free use of the QSL Bureau. The RSGB also runs many contests and the IOTA Awards programme for you to participate in and enjoy. To help you locally you have your RSGB Regional teams, this is very much your national society local to you.

For the large majority of RSGB members, membership currently costs approximately 12p per day for Direct Debit payers and 13p a day for those continuing to pay by Standing Order or Cheque. The increase in the subscription fee represents adding another 1p per day to those figures. RSGB membership, I think you will agree, continues to represent extremely good value for money. There are a number of ways that can make payment easier. You can pay one sum up front annually if you wish or you can spread the payments, quarterly or monthly.

The Society appreciates greatly your support and we hope that even it these most difficult of times you will continue to support the RSGB in its work on behalf of its membership and the wider amateur radio community.

Peter Kirby, G0TWW
General Manager

Could you write for *RadCom*?

Have you got a technical idea that you think people should know about? If so, we'd love to help you get it down on paper and into *RadCom*. Every year, amateurs just like you get in touch and discover that it's surprisingly easy to become a published author - and we even pay a fee for everything we print!

We are looking for original ideas that can form the basis of a project or technical article. All you need is the ability to write basic English, sketch your drawings and perhaps take photos in focus. We provide the polish. Articles are technically checked and edited; our draughtsman re-draws circuit diagrams etc into our standard format. You get to see it before it goes to press - and soon see your name and project in the magazine for real.

If you've been tinkering with something that you think deserves a wider audience, please get in touch with Giles Read, G1MFG, *RadCom* Technical Editor, by e-mail to giles.read@rsgb.org.uk or telephone 01234 832 714 (direct line).

Notifying Ofcom of SKs

To avoid any distress when the annual RSGB Yearbook is published, relatives or executors of licensees who have become Silent Keys need to inform Ofcom accordingly. The Of346a form may be used to surrender the licence, available at: http://licensing.ofcom.org.uk/binaries/spectrum/amateur-radio/apply-for-a-licence/of346a.pdf

A copy of the death certificate is needed too. This is to guard against fraudulent submissions, which has happened in the past. If preferred a letter is acceptable requesting the surrender due to the licensees' passing but again a copy of the death certificate is required.

Once surrendered, the licensees details will be removed from the Ofcom database, which is provided by Ofcom for the RSGB Yearbook.

RSGB EMC Pages

The RSGB EMC Committee has now totally refreshed the RSGB website pages covering EMC matters. The new information contained in the pages should be of practical help to anyone experiencing interference on the amateur bands, or causing interference to nearby electronic equipment. Just as importantly, the site now contains a survey questionnaire to capture information about the extent of interference to amateur band reception. Please, if you are experiencing regular local interference to your reception, report it on the short questionnaire available under the "I am experiencing interference" pages. This will enable the RSGB to build a creditable database of interference cases, which will help in its discussions with Ofcom.

CONGRATULATIONS

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

60 years

G3HQX	Mr J Brodzky

50 years

G3BYV	Mr J Crerar
G3RED	Mr D C Sylvester
G3TGO	Mr B W Vaughan
GB3RN	Royal Naval Amateur Radio Society
GW4RYK	Mr A J Richards
RS23071	Mr MJJ Dawe
ZC4MT	Mr M E Townley

QSL Matters

DESPATCHES. This time of year sees a slowdown of incoming cards from overseas. It's a knock-on effect of holidays within other overseas bureaus. However, it is more than matched by increased UK holiday, /P and 'GB season' cards.

This month, 10kg packages went to Germany, France, Italy, Poland, Spain, Sweden and Norway, with smaller packs going to Algeria and Uruguay. We've also had a busy time meeting many callsigns at the National Hamfest and at the RSGB Convention. There's been excellent feedback on the updated QSL pages in the 2011 RSGB Yearbook, especially the QSL card design notes and examples – a must read!

DO YOU REALLY NEED A VIA? This practice has spread almost out of control and it is a significant contributor to slowing down throughput.

Here are some tips to help us help you:

- If you change your callsign, keep SAEs with your old call sub manager for up to 5 years.
- Club stations – change your info on QRZ.com.
- Keep envelopes for the club, portable activity or your personal call with the correct sub manager for that call. Simply change the mailing address when required, if the destination or person collecting the cards changes - don't use via.

Whilst this applies to receiving cards, it also applies to outgoing cards. Not including the QSL route for a rare station can delay your card for weeks whilst we find the route, or get time to check it out. If you've waited years before sending the card, the QSL route may no longer be available.

G3I, J, K AND G4W & X CALLSIGNS. Your volunteer QSL manager tells us that, sadly, he will have to dispose of around 4,000 uncollected cards that are more than 3 months old, for which he has no envelopes. These will have to go by the end of the year just to make room for the incoming cards next year. To avoid disappointment, check with John, G4WSX by e-mail to bambad.g4wsx@talktalk.net.

National Radio Centre Bletchley Park

DO YOU WANT TO HELP? The National Radio Centre at Bletchley Park will be opening at Easter 2011. The NRC will be the centre and focal point of amateur radio in the United Kingdom.

The NRC will be open over 300 days a year and to assist us in running the centre we are putting together a team of well motivated, enthusiastic volunteers.

The four areas we want to cover are the centre reception, general guides, archive and demonstration radio station operators. We are also seeking volunteers to assist with GB4FUN and the Bletchley Park Trust/RSGB joint educational outreach programme.

The Society will provide the training and the uniform and you will receive travelling expenses and meal subsistence when on duty.

Ideally you will live within a fifty mile radius of Milton Keynes.

If you are interested please write to The Manager, NRC Bletchley Park, c/o RSGB 3 Abbey Court, Fraser Road, Priory Business Park. Bedford. MK44 3WH or e-mail GM.Dept@rsgb.org.uk.

ERROR

In the July publication of *RadCom* on page 14, Harlaxton Gathering, we gave the name and callsign Billy, 2E0XAL. This callsign belongs to Glyn Davies, 2E0XAL and it should have read Billy, 2E1AXL. Apologies to both.

There is an error on page 15 of October's *RadCom* regarding the GR2HQ station's award. The awards certificate were actually given out for working them on 3 or more bands/modes, not 6 bands as mentioned.

The donation from the UK Cluster Working Group of £738.88 mentioned in the October issue was for RCF/GB4FUN rather than the Spectrum Defence Fund. Our apologies for wrongly placing the generous donation.

RSGB Launches Major Amateur Radio Survey

On 1 October at the National Hamfest in Newark, the RSGB launched a major survey of the UK amateur radio and SWL community. We want to know how you pursue your hobby, your interests from QRP to 'moon bounce', what bands you work on, are you a Contester? All the information that is necessary to see which way the hobby is moving in the 21st Century. The survey is web-based and takes about 15-20 minutes to complete. It is open to all, RSGB members, lapsed members, non members and short wave listeners. At the end of the first week over a thousand radio amateurs across the UK had completed the survey, this is very encouraging. You have plenty of time to go on line at www.rsgb.org/survey to complete the survey, which runs until 31 December. Early completion would be appreciated because we want to start the data collection process and keep you posted on the findings as the information comes in.

Although the survey is designed for the individual radio amateur, a second group of questions is being prepared, designed for club participation, so that club members can discuss at length their collective views. This will be distributed to clubs shortly. Please encourage all your fellow amateurs to participate as this is an important moment in amateur radio history. The results of the survey are sure to influence the direction and strategy the hobby will take over the next 20 to 25 years.

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.

2E0GAO	Mr G Bridge
2E0NYC	Mr S Vizor
2E0RXX	Mr G Acton
2E0WOL	Mr W Walther
G0VHL	Mr P Jones
G1FBW	Mr T Howchev
G1LXI	Mr R Denman
G1PQJ	P J Wilson
G4IJI	Mr M C Walker
G7RQD	Mr M S Folkes
GI7GKC	Mr Boyd
GM0UKI	Mr M Blunn
GW1UYW	Mr K R Wallis
KD8DTS	Mr M C Robinson
M0BXM	Mr D Grimshaw
M0DAG	Mr D Godden
M0GUX	Mr M J Potts
M0MSA	Mid Somerset ARC
M0SJJ	Mr S J Jones
M0TDE	Triode ARG
M3PGS	Mr P Stevenson
M3YON	Mr J M Harrison
M6AEA	Mr C Walsh
M6AGI	Mr R J Coombes
M6CKY	N Gamulea Schwartz
M6CWA	Mr G Moon
M6DKM	Mr W Molloy
M6DOB	Mr B Cowan
M6DOC	Mr A Davis
M6GPC	Mr G P Coleman
M6IND	Mr P Ind
M6JPK	Mr J P Knight
M6MAQ	Mr D Marlaw
M6MHC	Mr M Heaton Cooper
M6PEC	Mr B Clayton
M6RUP	Mr A Tomlinson
MI0RZA	Mr L Keane
MW6BAS	Miss BA Sweet
MW6TJH	Mr R Orchard
N0XP	Mr A J Feldmeier
N2JL	Mr J N Liter
OH2KW	Mr A Liimatta
OK7PM	P Misek
PY7004SWL	Mr A Ubirajara Da Silva
RS204372	Mr C A Porter
RS205542	Mr I Clarke
RS206673	Ms K Adams
RS206695	F Pressland
RS206697	Mr B D Vile
RS206698	Mr G Wellstead
RS206714	Ms J Campling-Coles
RS206743	Mr N J Bates
RS206750	Dr G Di Genova
RS206776	Mr P Matthew
RS206777	Mr A L Powell
RS206798	Mr P S Croxford
RS206805	Mr D A Stewart
RS206808	C Brown
RS206817	Mr L J R Verschooris
RS206822	Mr M Steele
RS206829	Mr S K Littlechild
RS206831	Mr P Obrien
VA7BY	Mr N J Rushton
VE3FQJ	Mr D L Hoare
W4GDC	Mr G Christian
ZB2JK	Mr J M King

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

2E0ENW	Mr E Wilson
2E0PHL	Mr P Probst
2E0RGL	Mr G Lewis
G0AIL	Mr D T Penny
G0DDX	Mr G J Wilkin
G0FDV	Mr D M Jardine
G0MKC	Mr W V Dunn
G0RPU	Mr J C Symonds
G0TDJ	Mr S R Smith
G0UOB	Mr A Chilinski
G1PKV	Mr J A Sennitt
G3DIH	Mr M R Browne
G4GOC	Mr M C D Mann
G4PZO	Mr S P Rawlings
G4YPC	Mr P Croucher
G4YQA	Mr M W Lawson
G6TXP	Mr A P Cronk
G7SOV	Mr C E Howarth
G8BJQ	Mr L Case
G8PZL	Mr D W Price-Bland
GM0TKB	Mr L W Thomas
GW4SUE	Mrs M A Hill
GW6EUS	Mr R N Williams
M0IKW	Mr G P Cannon
M0MST	Mr D P Rimell
M1CMR	Mr B P Jarvis
MM0SGQ	Mr SA Gill
N2APB	Mr G L Heron
RS182007	Mr J H Greaves
RS93752	Mr C Daglish

RSGB Half Year Accounts

For the six months ended 30 June 2010

At 30 June 2010, the net deficit before interest income and Spectrum Defence Fund donations was £14,636 compared to a deficit of £36,513 in the prior year. The net deficit was £4,183 compared to a net deficit of £31,288 in 2009.

Income is in line with expectations due in part to the recent subscription increase. To date, no sponsorship has been received from the RCF as the GB4FUN programme has been temporarily reduced.

Cost savings have been obtained in the Amateur Radio and Examination departments, which have contributed to the overall improvement, year on year, in the Total Contribution from Activities. Commercial costs are £19,369 lower than the previous half year but the majority of this is due to the phasing of activities, eg the Membership mail out that took place in the first half of 2009 was moved into the second half of the current 2010 financial year.

This half year has been very busy with three major activities requiring attention and funding:

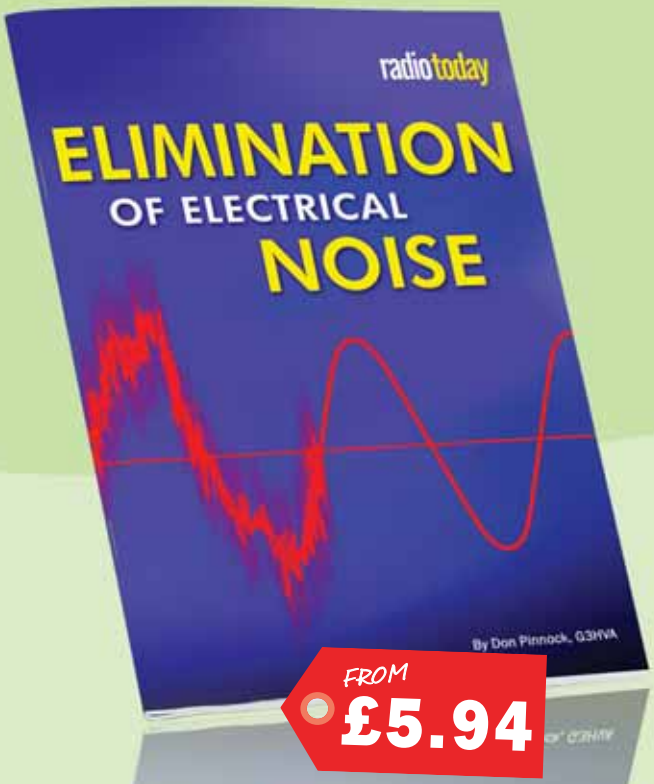
- The year commenced with the announcement of the Spectrum Defence Fund. This fund was launched towards the end of 2009 in response to the concerns of the Society and its members' to the PLA/PLT issue. Since 2009 donations of £17,617 have been received. Legal advice was sought on this matter and costs of £23,660 have been incurred. To 30 June 2010, net income and expenditure is £2,653.
- The National Radio Centre at Bletchley Park has been in progress since last year. The building has now been completed and the next phase, the interior design, is about to commence. The centre is expected to open at Easter 2011.
- We are conscious that to improve and increase the amount of work that we undertake we must find alternative sources of revenue. To this end we have recently appointed a fund raiser to attract funding for the running costs of Bletchley Park and GB4FUN. Once Bletchley Park is operational, GB4FUN will be re-located there so that when it is not on an RSGB visit it will enhance the Bletchley Park educational programme. To date, fund raising costs of £6,703 have been incurred and are included in Administration expenses.

UNAUDITED INCOME & EXPENDITURE ACCOUNT FOR THE SIX MONTHS ENDED 30 JUNE 2010

	30-Jun-10	30-Jun-10	30-Jun-09	30-Jun-09
Income				
Subscriptions	429,979		419,079	
RadCom Advertising	82,609	512,588	79,838	498,917
Books and Products for Resale		144,702		143,751
Sponsorship		4,250		15,000
Other Services - inc Examination Services		52,932		49,979
Total Income		714,472		707,647
Contribution from Subscriptions, *RadCom*, Publication and Services				
Subscriptions net of *RadCom* Publication Costs	320,679		306,208	
Amateur Radio Costs, net of Income, Sponsorship & Exams	(67,093)		(74,455)	
GB4FUN net of Sponsorship	(8,887)	244,699	(725)	231,028
Books and Products for Resale		38,791		38,228
Other Services net of expenses		5,943		5,786
Total Contribution from Activities		289,433		275,042
Less Non Activity Specific Overheads				
Commercial Costs		(60,917)		(80,286)
Administration		(185,150)		(177,049)
Personnel Costs		(3,352)		(2,683)
Office Costs		(43,530)		(44,185)
Landlord Costs		(11,120)		(7,352)
Net Surplus/(Deficit) from Activities		(14,636)		(36,513)
Interest Income		7,800		9,177
Irrecoverable VAT		0		(3,952)
Spectrum Fund Donations less PLA/PLT legal fees		2,653		0
Net Surplus (Deficit)		(4,183)		(31,288)

RSGB shop

NEW



FROM **£5.94**

radiotoday

Elimination of Electrical Noise

By Don Pinnock, G3HVA

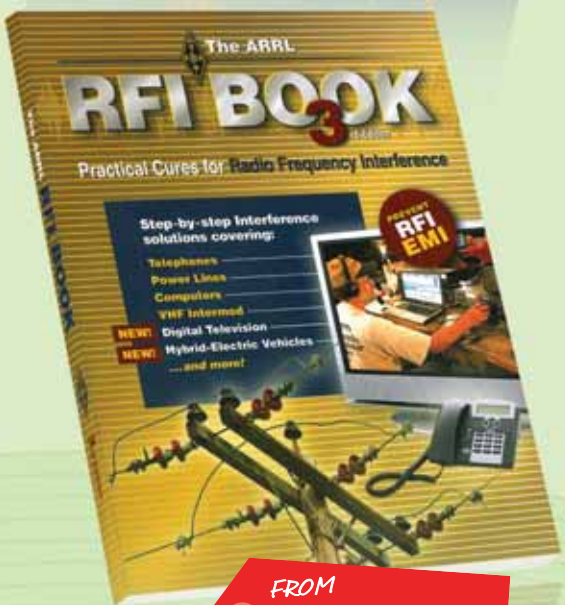
Many radio amateurs experience electrical noise problems and feel forced off the amateur radio bands. Don Pinnock, G3HVA is a firm believer that radio amateurs should deal with the problems rather than be forced off the air. *Elimination of Electrical Noise* therefore tells of Don's personal experiences and provides solutions to noise problems that will help many.

In *Elimination of Electrical Noise*, Don details the various types of noise, how it is generated and how best to deal with it. Faulty or maladjusted machinery or electronic devices can produce so much interference that normal reception is considerably affected. Even equipment operating below or close to International Standards can generate enough electrical noise to severely reduce the chances of a nearby amateur being able to enjoy his chosen hobby. Don describes how to track down a noise source, how to deal with it at its source, and how to put up defences in your own station to reduce noise entering via the mains wiring. He reports on his own experiments with selecting wire antennas that have increased immunity to external noise. And for those looking for a new house, there's advice on how to choose it from the point of view of noise.

If you suffer from electrical noise problems, Don's experiences and advice may well provide the solution you are looking for. *Elimination of Electrical Noise* provides the help you may need to take charge, tackle that noise problem and get the most from your hobby.

Size 240x174mm, 64 pages, ISBN 9781-9050-8661-0

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



FROM **£20.39**

The ARRL RFI Book – 3rd Edition

Practical Cures for Radio Frequency Interference

This new third edition of the popular *ARRL RFI Book* has been compiled by the highly trained experts of the ARRL and designed to give the best advice available on every type of radio frequency interference (RFI). From automotive to television, from computers to DVD players, from audio equipment to telephones, you'll find a step-by-step process for eliminating problematic interference in one convenient book.

The ARRL RFI Book begins with chapters on First Steps, EMC Fundamentals, RFI Troubleshooting Techniques before moving into various guides to specific areas of RFI. The reader will find practical advice on specific subjects such as, Transmitters, Televisions, DVD players, Computers, Stereos, Videos and Telephones to name but a few. There are even chapters covering External Rectification - "The Rusty Bolt Effect" and "Intermod" - A Modern Urban Problem. *The ARRL RFI Book* also includes resources for addressing new realities of digital cable TV and satellite systems, over-the-air TV signals, troubleshooting, and hybrid and all-electric vehicles.

If it's a device that can be affected by interference, including your radio receiver, you'll find practical cures in this book.

Size 210x275mm, 320 pages, ISBN 9780-8725-9091-5

Non Members' Price £23.99 **RSGB Members' Price £20.39**

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

www.rsgbshop.org

E&OE All prices shown plus p&p

Donate online at www.rsgbshop.org
Spectrum Defence Fund

GB2AC

In September, Appledore & District Amateur Radio Club put on a special event station for the Open Day at the National Trust Arlington Court and Carriage Museum located near Barnstaple in North Devon. Mike, G3PGA and Brian, G0RVS set up the station on Friday and operations began at around 9am on Saturday morning. The number of stations worked was not great, reflecting the poor propagation conditions, but was compensated by working two other National Trust stations, GB2LD and GB4KL, under very difficult conditions.

Interest from members of the public was very good with many enquiries made as what amateur radio was all about to serious interest on becoming a radio amateur.

Amateur Radio For All Plans

A pair of Pearl Anniversaries is planned in Fermanagh for April 2011. Amid celebrations of its thirty years of service, the Share Centre will host Lough Erne ARC's 30th radio rally. This annual gathering has been Ireland's major meeting place for northern radio amateurs and southern radio experimenters ever since this Fermanagh club's first rally in April 1982. The 2010 rally theme was low power radio with a talk broadcast on the internet that attracted world-wide interest. The 2011 rally theme, blending Club and Share aims, will be Amateur Radio For All, encouraging this culturally important technological pastime.

Some of the year's 26 new Foundation licensees from courses at Share were presented with Welcome to Amateur Radio certificates at the 2010 rally by Billy Pollock (right), himself 50 years licensed, callsign GI3NVW.

Open Lecture

On 2 November the Institute of Physics is holding an Open Lecture between 7 and 9pm at the Rutherford Lecture Theatre, University of Kent, Canterbury CT2 7NZ. The lecture will be given by Dr Ken Smith and is entitled "'Dafty' and Electromagnetism: What a Revolution". James Clark Maxwell was nicknamed 'Dafty' by his school and college contemporaries yet he not only established the electromagnetic theory of light but triggered off Einstein to establish Special Relativity.

South Cheshire ARS does CHOTA

On 11 September, members of the South Cheshire Amateur Radio Society took part in Churches and Chapels On The Air using the special event callsign GB2SPC. They operated from within St Peter's Church, Minshull Vernon, Crewe. Two stations were set up: HF just inside the door, next to the font, using a Yaesu FT-857 and a trap dipole for 40/80m that was suspended about 30ft high between the church tower and a tree and VHF near the altar using a Kenwood TM-231E and a 2m/70cm collinear on a 20ft pole in the churchyard.

A very enjoyable day and varied working conditions with some club members able to be there all day and others coming along to help out when they could. They are now looking forward to next year and have already discussed returning with the Vicar.

Christian, M6TKS and Aaron, M6PSP operating the HF station next to the font.

Tamworth Foundation Success

In September, Tamworth ARS held a Foundation course for two candidates and both passed with flying colours. From left to right are Bob, G1BCZ, Ian Perkins and Robert Nicholson.

Chiltern DX Club Committee

At its recent AGM, the Treasurer for the past seven and a half years, Nigel Cawthorne, G3TXF stood down. The President, Neville Cheadle, G3NUG presented him with a commemorative plaque in honour of his services to CDXC. Nigel is staying on the committee to assist with some transition tasks.

Tony Bettley, G4LDL, who has been acting as secretary, was duly confirmed as secretary and Gordon Rolland, G3USR as Treasurer. All other members were re-elected to their current positions. Following the AGM, a BBQ was held in glorious sunshine and attended by 103 members and their partners.

CDXC is the UK's largest group of HF DX and contest-oriented radio amateurs, with a membership of 750. It promotes good operating both in DXing and contesting and offers financial support to major DXpeditions as well as publishing a bi-monthly magazine *The CDXC Digest*. More information can be found on the club website, www.cdxc.org.uk.

CDXC AGM and Summer Social was attended by over 100 members and their guests. Photo: G3TXF.

Farnborough & District RS

The club has had a third successful year of amateur radio exam courses, covering Foundation, Intermediate and Advanced. The latest Foundation course resulted in six successful candidates. All have expressed a desire to complete the Intermediate course before the end of the year. In the photograph from left to right are John, G3KND instructor, Robert Beasley, James Cassar, Andrew Beasley, Colin, G8BCO, lead instructor, Keith Jones, Rex Moldoveanu and Nigel Valvona. Congratulations to them all for obtaining exceptionally high pass marks.

Scunthorpe Steel CHOTA

For the Churches on the Air weekend Scunthorpe Steel ARC put on a station at Belton Parish Church using the callsign GB5BPC. The station was inside the church along with displays of many of the pastimes and hobbies carried out in the village.

The antenna was a 264ft doublet with the centre attached to the flag pole atop the church tower at approximately 70ft. The 450Ω ladder line was dropped down through the bell tower and finally to the clock room where they had an auto tuner. Many of the 150 stations worked said they were the strongest station on the band.

Many children – and some grown ups – passed greetings messages and received a special certificate to confirm it. QSL cards have been printed and will be sent out through the Bureau.

Region 6 Club of the Year Winners

At the September meeting of Meirion Amateur Radio Society, the members were pleased to welcome RSGB President Dave Wilson, M0OBW. Dave's visit to Meirion ARS was to present their Region 6 Club of the Year award. The award came after a very busy year for MARS, during which they raised funds for the RNLI (through SOS week) and for the Help for Heroes charity, plus numerous other events, where the club staged demonstrations of amateur radio to promote our hobby. September's meeting was well attended and in addition to the award, Dave gave a short talk and presentation to the members about the role of the RSGB. The photo shows Dave presenting the Region 6 award to Simon Poyser, MW0GSR, club chairman. The club is on the web at www.meirion-ars.co.uk.

GB5RSB

In September a dedicated band of Sheffield Amateur Radio Club members manned a special event station to celebrate the Sheffield Royal Society for the Blind's 150th Anniversary. On the preceding Sunday, Steve and Peter erected a G5RV antenna on a 20 foot mast, which itself was on the flat roof of the 60 foot high new building that houses not only the Sheffield Royal Society for the Blind but dozens of University students. The thought did cross both their minds that there might be RFI/EMC problems with the students but since GB5RSB operations were to be daytime only (10am-3.30pm), it was felt that this would not be an issue as most of the students had yet to 'come up' for the new term.

The station was simple: a G5RV antenna, with 34 feet of twin feeder and 60 feet of 50Ω coax, feeding an Icom IC-706 Mk2 G running 100W on all bands from 80-10m. In addition, a large display of photographic material about Sheffield Amateur Radio Club, amateur radio in general and the RSGB was on show. Good signals were put out far and wide from the station but sadly the local receiver noise level was S6 to S7 almost all the time so many of the stations calling were not heard. Nevertheless, 40m turned out to be the most reliable band, especially during the late mornings and many European countries were worked. Conditions on the higher bands were quite poor but the highlight was an SSB contact, on Friday lunchtime, with VK3UZZ on 20m via short path. Spotting GB5RSB on the DX cluster usually brought lots of callers within a few seconds. The problem was hearing them! Just short of 200 stations were worked in the five days.

The station was visited during the last afternoon by two local dignitaries, the Lord Mayor of Sheffield and David Blunkett MP, a former Home Secretary and still MP for the Sheffield Constituency of Hillsborough and Brightside. Mr Blunkett spent some fifteen minutes with the SARC Chairman Peter Day, G3PHO, discussing what a fine hobby amateur radio is for visually impaired people and he also expressed genuine concern when the subject of PLT interference to this and other radio services was brought up.

All stations worked will be sent a special QSL in due course.

Photo: Keith Gudgin, G0CXP.

Carlisle Exam Success

Carlisle & District ARS recently ran Foundation and Intermediate exam courses. Both were rewarded with exam success. The photograph shows, in the back row, Bernard VanNvil, Foundation, Barry Thompson, Intermediate, Malcolm Steele, Foundation, Philip Boxx, Foundation, Garry Ingham, 2E0FMC, invigilator. In the front row you can see Colin, G6LSO, Pauline English, invigilator and Harry, 2E0ZYF, Invigilator. Photo by Steven, M5FAB, invigilator.

Triple Success

The photograph shows Midland Amateur Radio Society member Phil Barber who has now passed all three amateur radio exams and can be seen here holding his Advanced pass certificate. His instructor was Ron, M0WSN. Midland Amateur Radio Society has now started the next course.

Advanced Course Starting Soon

North Wakefield Radio Club is about to start an Advanced exam course, to be held on Tuesdays from 7 to 10pm. The club expects to run about 12 to 14 weekly sessions leading towards the exam in February 2011, although candidates can take a later exam date if they feel they need a little extra time and tuition.

If you require further information, contact Chris Street by e-mail to secretary@g4nok.org.uk.

GB0KEW Steam Museum

Whitton ARG took part in Pumping Stations on the Air at Kew Bridge Steam Museum. They were supported by the RSGB Regional Manager Alison, G4ROG, who acted as their 'meet and greet' and explained the role of the RSGB to the public.

The Club HF station operated on 80, 40, and 20m and was kept busy on both days with radio enthusiasts from around the world calling in. The public were able to hear the two way conversations as they had a prominent position within the museum. A check log can be found on their web page so you can check your contact with GB0KEW.

The radio station used an Icom IC-765 Pro III with matching ATU and 400W amp plus a G5RV that was fixed from the very top of the museum tower down to a old steam beam by the car park. Many stations were worked and Whitton ARG is looking forward to receiving their QSL cards that they will display at next year's event.

Railways on the Air

Despite the driving rain and high winds at the end of Railways on the Air weekend, members of the Bittern DX Group retreated into a goods truck to draw the raffle in aid of the Norfolk and Norwich Association for the Blind. Emma Purdy, the Volunteer Services manager from NNAB, drew the winning tickets. The top prizes were all for family days out at various attractions in the North Norfolk area including the Muckleburgh Collection at Weybourne. This year £700 was raised by the group by selling tickets at three events attended by the public, North Norfolk Country Fair, Castles and Stately Homes on the Air and Railways on the Air.

The railway truck, which was designed as a guard's van fitted out to carry racing pigeons, had been fully restored to its original splendour and was one of the few places at Holt Station that offered shelter from the torrential rain.

The Activation of IO81FP

Rhondda Amateur Radio Society recently took their amateur radio station to the summit of Bwlch. Near the summit is a lay-by, which was to be the base for operations. The lay-by was empty so the three cars all pulled in and set about erecting antennas – everything from an Outbacker style antenna with mag mount to a Chap-stick MP-1 manual screwdriver with radials. During the afternoon the two operators were able to work and hear rare DX on 17m. When one station battery went flat the IC-706 was transferred to the other station. In this configuration, they worked their best DX – Bob, VP8LP in Stanley on the Falkland Islands (Grid GD18BN), a distance of 7809 miles. The output power was little more than 20W for this contact.

More Exam Results

Brede Steam ARS have four students who have successfully passed their Foundation exam. They sat their exam in October at the First Brede Scout Groups hall. One of the candidates is a Scout with the Group, Isabelle, her brother Louis and father Dan also took their exam at the same time (see photo). The other candidate was John who applied to take the course on the day the club started the training. They are all looking forward to starting their training for the next level of exams. All the members of BSARS wish to take this opportunity to wish the four of them good luck for the future in amateur radio. Thanks go to Phil, G3MGQ and Tony, G4CUS for their time and skill in training. To find out when BSARS are starting their next course, e-mail m0nuc@aol.com or ring Steve, M0SSR on 01424 720815.

Field Day Activity

Kilmarnock and Loudoun ARC was active as MM0KLR/P on the weekend of SSB Field Day. This was the club's first time operating in the open section of the contest.

The team was Gordon, MM0GOR, Graham, MM0GHM, Ian, 2M0ISM, Barry, GM3YEH, Peter, GM7AAJ and Allan, GM3OZB. They had a good weekend and the weather was good with only a few rain showers during the night. At least the station was set up and taken down in the dry. Thanks to the club members who assisted with station building and also the farmer whose field they were operating from just outside the town of Newmilns.

Two more Intermediate Licenses

Horndean & District ARC ran its fourth Intermediate exam in September. Both candidates passed. Jason is now 2E0VMZ, and Mark is now 2E0CCW. The club would like to congratulate the successful candidates and thank the club's Intermediate licence tutors, Mike, G4PRG and Gerald, G3COO for the Intermediate course and all the exam team.

Epping Forest Festival

Loughton & Epping Forest ARS took part in the Epping Forest Festival in September. Operating as GB2EFF, many of the 25,000 visitors came to the LEFARS stand to view the display of radio related ephemera. Along with amateur radio info packs, they also presented many of our colourful certificates to youngsters who sent their name in Morse code.

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Activity From Leith Hill

Dorking and District Radio Society is making good use of the fact that it is the nearest club to Leith Hill in Surrey, the highest point in the south east of England at 967 feet. Usually on the second Friday (weather permitting) members operate a portable station using the callsign G7DOR/P on 2m (144.300 USB and 145.500 FM) and HF (3.772 LSB) using an Icom IC-910 and IC-706, with a 5 element Yagi for VHF and a doublet for HF.

Contacts and tests are welcomed; skeds may be arranged with Jon, G0GNA, by e-mail to jon.weller@btnternet.com.

The geographical references for the station at Leith Hill are 51.1757°N, 0.3697°W and NGR 139431. Its locator and grid square are IO91TE and TQ14.

LEFARS Foundation Course

In September Loughton & Epping Forest ARS held a weekend Foundation Licence course. This is the third staged by the club this and the 17th overall. All eight students passed. They are Wendy Henson, Steven Page, Paul Milton, Jason Salter (kneeling), Brian Hodson, Lauren Harris-Pugh, Darren McCarthy and Jennifer Sniezek.

Thanks to the LEFARS instructors and helpers Derek, M0XDC, David, G3ZXF, Ron, G6LTT, John, G8DZH, John, G1DJI and John, G0VEH (Lead Instructor). The next Foundation course is scheduled for the weekend of 15/16 January 2011.

Summer Social

The Midland Amateur Radio Society held its summer social at the end of September, organised by the new social secretary Jackie, 2E0JRF. The BBQ was a success and club members attending all had a great time and are looking forward to the Christmas event on 8 December. The photo shows Phil, M0PBA, Eddy, 2E0EUN, Jim, M1CPC, Jim, M3XJP, Ray, M0RAQ, Ron, M0WSN, Jamie, M6UKV and Tony, G6VQU.

Top Marks

The latest Intermediate exam student at Midland Amateur Radio Society was the most successful so far. Student Edward Underhill was their first ever 45/45 pass. He can be seen in the photo with his instructor Derek, G7ORT.

New Receiver

The Alinco DX-R8e is a new HF communications receiver that will be arriving in the UK in December. The DX-R8e will sell for around £500 and features an I/Q output that will allow it to be used as an SDR radio too, using free downloadable software. Covering 150kHz to 35MHz with IF shift, narrow / wide filters, memory scan and all mode reception, there are more details available at www.nevadaradio.co.uk.

Scouts Foundation Course

1st Astley Scout group based in NW Manchester has recently run its first Foundation Licence course. Congratulations to Scouts Matthew and Chris and leaders Shane and Boom for passing their exam and they can now call themselves 'Radio Scouts'.

A big thank you goes out to Ian and co. from the Simpson Radio Club in Manchester for tutoring and organising the exam. They are now looking forward to hosting their annual Jamboree On The Air event and, for the first time, have Scout radio operators. The group hopes to run another course over the winter and is now looking at ways to raise some money to purchase some new radio equipment so the Scouts can practice their new skills.

Chief Constable's Award

Alan Marwood, G8SSL has received the Chief Constable's Lifetime Achievement Award. Alan is a full time paramedic with the Nottinghamshire Ambulance service, but still manages to put in around 50 hours service a month as a Special Constable. He became a volunteer special constable in 1970 and two years later was awarded the Queen's Gallantry Medal for helping to arrest armed robbers who fired shots at him. Alan is well known on VHF and UHF in the Nottingham area and served on the RSGB repeater management committee until 2001. He is currently active on 23cm and HF QRP portable operation.

NEWS IN BRIEF

• On 27 September, ITU-R SG1 approved a new Recommendation on PLT. It defines the acceptable level of noise degradation for the amateur service as 0.5dB, above the noise levels as defined in Recommendation ITU-R P372. These levels of degradation were accepted because of the inputs made on behalf of amateurs world wide by the IARU.

Official Open Day

The Elderslie Amateur Radio Society had its official opening day in August. As it was also William Wallace day it seemed a good reason to get dressed up for the occasion! Wallace, a hero to the Scots, was born in Elderslie, hence the connection.

HF Field Day

In September, the Carmarthen Amateur Radio Society had a HF field day from Mynydd Llanllwni mountain in the hills behind Carmarthen Town. The QRA locator is IO72WA and the location is 1300 feet ASL. The purpose of the day was twofold, one to introduce new training members to radio operation and two for a club BBQ. The photo shows Julia Orchard as a Foundation licence trainee learning radio operation. Club details at www.carmarthenradioclub.org.uk.

HRH learns about Amateur Radio

Denny Morrison, GM1BAN, RSGB Regional Manager for Region 2, recently had the opportunity to tell Prince Charles about the time he contacted an American astronaut using amateur radio during a visit to Castlehill Heritage centre.

The centre provides a base for local radio amateurs and while His Royal Highness was speaking to Les Thomas and Denny Morrison he asked about the most distant place they had contacted and was told that Denny had managed to speak to American astronaut Bill McArthur a few years ago while he was travelling at 17,000 miles an hour 170 miles above the Earth. Photo and story from G. Calder, g.calder@nosn.co.uk.

CDXC Portable Rigs

CDXC now has three portable rigs that can be borrowed by CDXC and RSGB members. CDXC wishes to make these rigs widely available so as to encourage members to enjoy the delights of DXpeditioning. They are ideal for small teams and for IOTA operations. Each kit comprises Yaesu FT-450AT transceiver, MyDel MP 8230 switch mode power supply, Vibroplex Standard iambic paddle key, Heil ProSet 4 headset and mic, Heil HS-footswitch, documentation pack including detailed contents and waterproof Peli 1550 case. The kit weighs 13kg and the external dimensions of the case in are 52 x 43 x 21cm.

To enquire about borrowing these kits and finding out about the conditions of the loan please contact Neville, G3NUG, by e-mail to g3nug@btinternet.com.

CDXC are grateful to the following for sponsoring these rigs: Martin Lynch & Sons, Neville, G3NUG, the RSGB IOTA Committee, Vibroplex and Yaesu UK Ltd.

Shiny New Callsigns

In September, four members of Chorley and District ARS passed their Foundation licence examination. They are pictured with their pass certificates and now have their shiny new callsigns. From left to right: Chris, M6CPH, Christopher, M6RWN, Ness, M0NES, club membership secretary, with the club's youngest SWL, Joseph, M6JRZ, aged 12.

NEWS IN BRIEF

• Thunder Bay MCTS Centre, the Canadian Coast Guard Radio Station, proudly celebrates 100 years of radio service. Built by the Canadian Marconi Company in 1910, the new 'wireless' station, MUG Port Arthur, was the first and only Canadian Great Lakes Marconi station ever built.

During the November 2010, the Centre's amateurs will be operating special event station CG3MUG, to celebrate the 100th birthday. The regular Amateur Radio callsign is VE3VBA. There will be several options for Amateur Radio Stations and SWLers to obtain a special 100th anniversary CG3MUG QSL card. Details at http://my.tbaytel.net/va3rom.

A Solid Foundation at Warrington

September saw the successful finale of the first formally organised Foundation course, run by the Warrington Amateur Radio Club. The course, organised by Paul, G7ODJ and led by lead instructor Albert, G3ZHE, was held over two days at the WARC clubhouse in Bellhouse Lane, Grappenhall. The enrolled students studied very hard and this resulted in five successful passes in the recently approved Foundation examination centre. Students David, M6KDC, Andy Lennon, James Turner. Jason Preece, Hazel Smith can be seen proudly displaying their pass certificates presented by lead instructor Albert, G3ZHE and club secretary Paul, G7ODJ.

This achievement was not only due to the hard work of the students but also to the dedication of the instructors and assistants. These included Mike, G4VSS, Alan, G8WQE, Carmel, M3CFI, Vincent, M0LCR and David, M0TUB.

Twinned Clubs

In September, the Radio Society of Harrow hosted five members of their twinned sister club, F6KRK Radio de Saint-Quentin-en-Yvelines from SW Paris. Newly appointed RSGB Regional Deputy Manager Simon Bell, 2E0SBQ was there to welcome them to Harrow. The weekend activities included a visit to Bletchley Park, meeting members of MKARS and RAF Hendon Aircraft Museum and much socialising. A very enjoyable time was had by all who attended. In 2011 RS Harrow looks forward to being hosted by F6KRK.

RSGB NFD 2010

G4OBK/P from a summit in Yorkshire.

ENTRIES UP AGAIN. It is pleasing to report that the number of entries in NFD 2010 was, at 56, the highest since 2004 and 17% up on 2009. Entries in all sections were higher than last year, the Restricted section being up by one to 25 and the Low Power section by one to 13. Perhaps surprisingly given the difficulties clubs have been reporting securing support from their membership for NFD, the Open section was up from 13 to 18 entrants.

Types of participants varied from dedicated contest groups, to local clubs for whom NFD is part of the regular annual schedule of events, to basic singleton stations. Some treated it as a social event with a barbecue, others as part of a weekend in the open air doing a range of amateur radio and family activities, and yet others as an opportunity for operator training. Likewise the types of station varied for the very simple to the highly complex, requiring a lot of organisation and resources. A good example of the former was G4OBK/P, the station of the Travelling Wave CG, operated by Phil Catterall, G4OBK. Phil operated from a beach shelter a long way from the beach, atop a SOTA summit, Bishop Wilton Wold in Yorkshire. He powered his FT-857 station from three smallish batteries until forced off the air by midges, power running out and moths dive bombing the LED headlamp he was using for illumination!

In terms of continuity, 39 of last year's entrants took part again in 2010, and although 9 of 2009's participants did not do so this year, this was more than offset by 17 stations who were not on last year (of which at least 4 were first timers in NFD). One of those first timers was the entry by G6UW/P, organised by Ed, M0TBK. Ed is the son of Dave, G3TBK and, having supported the family station for many years, decided to go out on his own this year. Hopefully, we can look forward to some serious inter-family competition in future years.

SADLY MISSED. A sad piece of news is the death of Pat Perkins, G3MA who died in 2010. Pat provided what was probably the last surviving link with the very earliest days of NFD, having first taken part in the event in 1934. Thereafter he operated every year that the contest was held until 2008, after which he was incapacitated by a stroke. The Contest Committee and, I am sure, the whole of the UK contesting community offer Pat's family and his friends in Gloucester AR&ES our condolences.

LOG CHECKING. Adjudication was greatly simplified by the software tools now available. Most entrants are now familiar for the use of the robot for log submission: this allows many errors to be put right without adjudicator intervention. This year, for the first time in NFD, a new adjudication program developed by the Contest Committee's Mike, G0GJV was used for checking. This greatly simplifies the adjudicator's task by integrating the tasks of format converting overseas logs (which are generally submitted in STF format), rescoring logs to a common standard and deducting points for errors. These were previously separate activities and their outputs had to be brought together manually – a time consuming job. The adjudicator, of course, still has to make a human judgement on each contact identified by the program as a potential error, but the new program presents information in a way that makes that task easier. As usual, logs were exchanged with other Region 1 societies holding their CW Field Days the same weekend and this, together with check logs, provided a pool of over 550 logs from which contacts could be cross checked. A number of station inspections were carried out – many thanks to the inspectors.

Along with conditions, which are discussed below, the thing most entrants remember about NFD is the weather. This year seems to have been a real mixed bag. Several stations reported heavy rain whereas others commented on the consistent good weather. However, most reported it to have been a mix of rain and shine. One consistent theme was the occurrence of thunderstorms, mainly overnight, leading to heavy QRN that made things difficult on the LF bands.

CONDITIONS. Many of us were hoping that the long awaited upturn of the solar cycle would arrive in time for NFD 2010, but the sun did not oblige and we were again disappointed. Nonetheless, the total number of QSOs made by UK entrants was up by 7.9%. What is interesting is the breakdown across the bands. The LF bands (160 & 80m) were slightly down on QSO numbers compared with 2009. Conversely, the HF bands (15 & 10m), despite a low solar flux of 69, were way up, carrying almost double the traffic of last year. And the MF bands (40 & 20m), which are generally open for much of the contest and are therefore used when the more time critical bands are not viable, were around 12% down – probably because of the improved pickings available on the higher bands. Looking now at how things went on a band by band basis:

As usual, activity on 160m was fast and furious for a limited period. Activity ramped up rapidly from around 2045, peaking between 2115 and 2215 (all times in this report are UTC). Indeed, this period provided the highest hourly QSO rate of the whole contest for UK stations, with 1233 contacts appearing in the logs. This corresponds to approximately 0.25 QSOs per kilohertz per minute in the CW part of the band. Activity was largely over by 0300, tailing off completely by 0330 except for very occasional contacts during daylight hours as entrants mopped up other stations they had missed earlier. Although many stations complained that higher than usual QRN levels made things difficult, the total number of 160m contacts was less than 2% down on 2009. 43% of QSOs made by UK stations were intra-UK, 35% were with stations in Germany and the remaining 22% were from all around the rest of Europe. Although 26 countries were worked, no contacts at all outside Europe were made on the band.

80m followed a similar pattern to 160m, but activity started around an hour earlier and finished around an hour later. Peak contact rate was achieved between 2015 & 2115, thereafter remaining fairly steady at a level around 30% below the peak until around 0400, with the last QSOs (except for a few stragglers during the day) just before 0600. A total of 40 countries were worked on the band. Almost all QSOs were within Europe, two thirds being with the UK or Germany. However a dozen or so east coast North American stations, a handful of Asiatic Russians and a single Puerto Rican were also worked.

40m was the only band to carry significant levels of traffic for the whole 24 hours. As such, it provided a pool of contacts that could be made when the other bands were not delivering a good QSO rate. This is demonstrated by the distribution of contacts across the period: peaks of activity occurred between 1930 and 2015 (as the HF bands were closing and before the LF bands had opened) and 0345 and 0545 (when the reverse was true). There was a final increase in the last 45 minutes when stations were scratching around for stations they had not already worked on the other bands. Contacts with 55 countries were made, including all continents except Antarctica. Again, these were mostly with Europe but with a good sprinkling of North Americans (72 callsigns, providing 220 QSOs). DX worked included

Open section entrant G3TBK/P in Lincolnshire.

A simple Low Power station - G3HEJ/P.

MM0ROV operating GM3BSQ/P.

6Y, 9J, A6, UA9, VK6 (worked by 9 UK stations), YV and ZL.

20m was the band that provided the greatest number of QSOs (10,307) and also the highest number of countries worked (73). Although it was possible to make contacts throughout the whole 24 hours, less than 100 per hour were made between 2045 and 0545, and only the two 20m single band entries remained on the band overnight. Peak QSO rate was between 1915 and 2030. 90% of the contacts were with Europe and of the remainder, 34% were with North America, which was workable during 18 of the 24 hours: 37 states and 3 provinces appeared in the logs. DX worked included 9K, 9M6, A6, E2, J2, JA, LU, PY, V5, VK, VP8, VU, YV and ZL.

15m was a bit of a surprise this year. Despite the moderate solar flux, the number of QSOs was 69% up on 2009. The band was active from the start of the contest, peaking between 1630 and 1730 and dying away by 1945. The Sunday provided substantially more activity, starting from 0450 and lasting until the end, with a peak between 0730 and 0830. 94% of contacts were with Europe. The rest, apart from a handful of African and American stations, were Asian – the majority being Asiatic Russians. DX worked included 7Z, 9J, V5 and YV.

10m was in cracking form, providing its best performance for many years for many stations, with QSO numbers up 167% on last year and the band leader making over 300 contacts. Conditions seemed to slightly favour stations in the west of the UK. Peak activity was in the first hour of the contest dropping away thereafter and ceasing by 2000. On Sunday, contacts were possible for most of the day, starting at around 0615, and peaking between 0900 and 1000. 93% of contacts were with Europe. The rest, apart from two African calls (9J & V5), were with Asia, the majority being Asiatic Russians.

RESULTS AND TROPHIES. The results have already been published on the Contest Committee website at www.rsgbcc.org/hf/results/2010/nfd2010.shtml but, in summary, the results are as follows:

- In the Open section, the winner was Orkney ARC, GM3POI/P, up from second in 2009. Bristol CG G6YB/P was second, returning to the Open section after several years in Restricted. Newbury & DARS, G5XV/P was third, having entered a check log last year.
- In the Restricted section, last year's numbers 1 and 2 swapped positions. Three As CG, on their travels again and operating this time from Wales as GW0AAA/P, was the winner. Last year's winner, Flying Pigs CG, G0IVZ/P, was second, and Sussex Downs CG, G4FNL/P was third for the second year running.
- In the Low Power section, the winner was Reading & DARC, G3ULT/P, up from second in 2009. Newbury ARC, G3XVR/P was second, up from fourth last year. Another Reading & DARC entry M0AAA/P was third, moving up from 11th in 2009.

Trophies are awarded as follows:

National Field Day Trophy	GM3POI/P	Orkney ARC
Bristol Trophy	GW0AAA/P	Three As CG
Reading QRP Trophy	G3ULT/P	Reading ARC
Scottish NFD Trophy	GM3POI/P	Orkney ARC
Gravesend Trophy	G0IVZ/P	Flying Pigs CG
G6ZR Memorial Trophy	G6YB/P	Bristol CG
Frank Hoosen G3YF Trophy	M0HWC/P	Hadley Wood CG

STATION DETAILS. The most common transceiver reported was the Elecraft K2/3 series, with 12 in use. This was followed by six IC-756s and four members of the FT-1000 series. The rest, with the exception of a single TenTec Orion and, for the first time in NFD, one FlexRadio, were a wide assortment from the Yaesu / Icom / Kenwood marques.

Antennas followed what is now a fairly standard pattern. Open section entrants tended to use beams of various sizes for HF, and separate dipoles for the LF bands, whereas the most common Restricted and Low Power section antennas were doublets, usually around 270ft long, in either dipole or inverted V configuration. Use of auto ATUs was more prevalent this year. One group tried a quad loop for 40m, with switchable half wave stubs allowing it to be fed at either the side or base with the intention of providing either high or low angle radiation. They reported that the choice of feed point seemed to make little difference and that it performed equally badly either way!

Logging programs were dominated by *SD, N1MM* and *Wintest* (in that order), with a few other commercial or homebrew programs in use.

BAD LUCK STORIES. The weather, generators and equipment problems crop up every year as a source of banana skins for entrants –2010 was no exception. The weather provided something of a double whammy, with both rain and thunderstorms inconveniencing entrants. Several stations had to close down for varying periods due to thunderstorms: one actually had a lightning strike on their antenna (fortunately after the feeders had been disconnected) and another had their 160m ATU flashing over due to static. Many stations reported heavy rain and three had their tents flooded, one of which had to be bailed. Three groups reported generator failures (fortunately two of these were at either end of the contest and caused little disruption) and a fourth had generator-produced hash. Two stations had transceiver problems and had to change to a spare, while another had problems with chirp and poor keying. PCs weren't immune either. One overheated as a result of being located on top of the rig: and at the other extreme, another got water into the keyboard from a leaking tent.

And finally a cautionary tale. The writer's own club managed to avoid all the above problems – but instead was beset by injuries. Mike, G3VYI fell out of a barn while collecting the 20ft poles that our farmer kindly allows us to store there and hurt his arm (which, after driving 150 miles home, was found to be broken at the shoulder): he was unable to operate but did sterling service using the spotting receiver. Steve, G3UFY spent too long on his knees assembling the beam and exacerbated a previous injury which resulted in his knee swelling up alarmingly and needing to be wrapped in ice packs from the catering department. Fortunately Steve does not use the key with his knee (despite what he may sound like on the air) and he was able to operate, albeit in some discomfort. It's easy to forget that NFD can be a hazardous environment, so it's worth recalling the words from a certain 1980s police series… "Hey, let's be careful out there".

NEXT YEAR. That's all for this year: NFD next year is on 4/5 June – so get the date in your club and personal diaries now!

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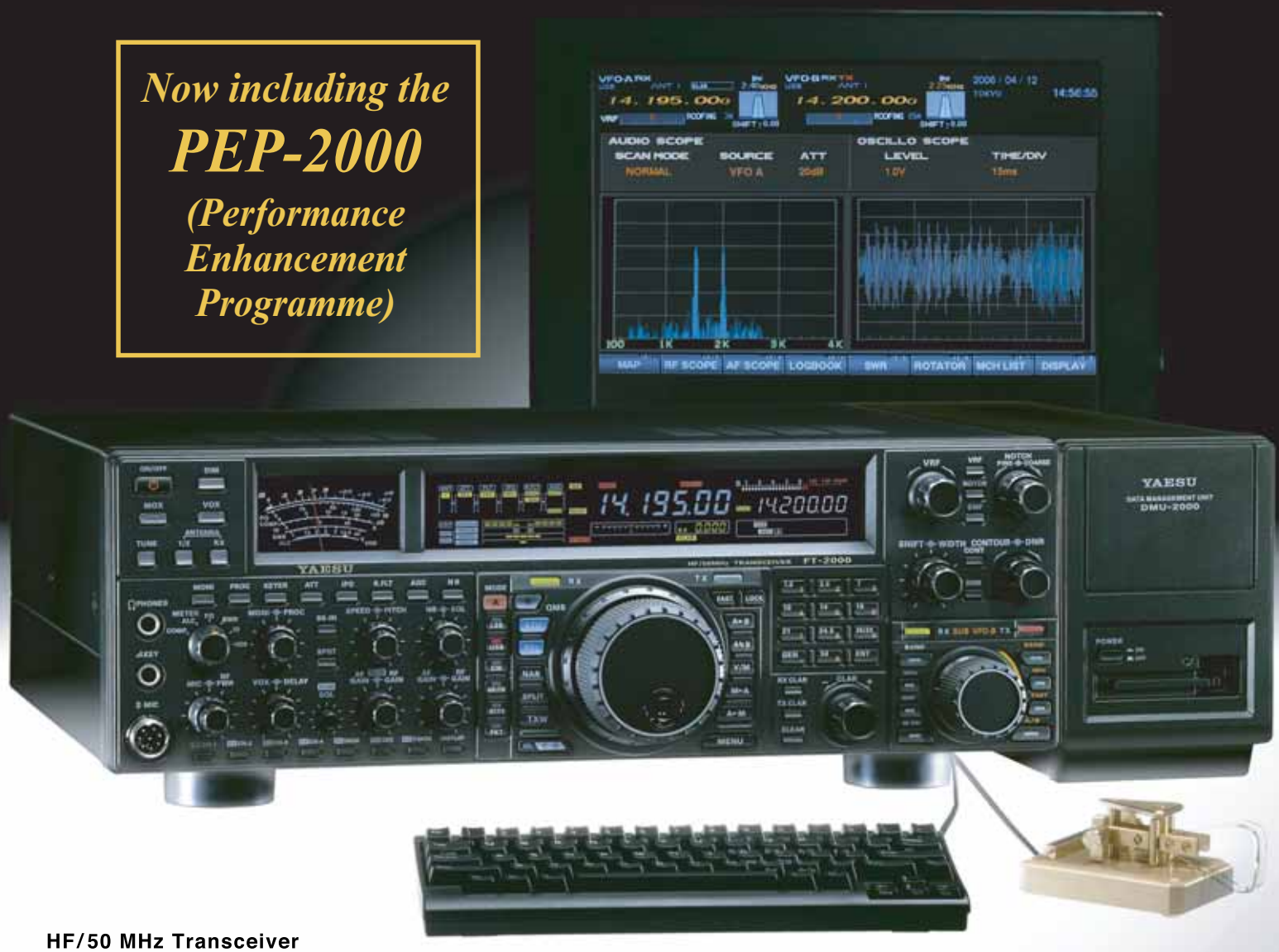

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Homebrew

We build some RFI/TVI filters.

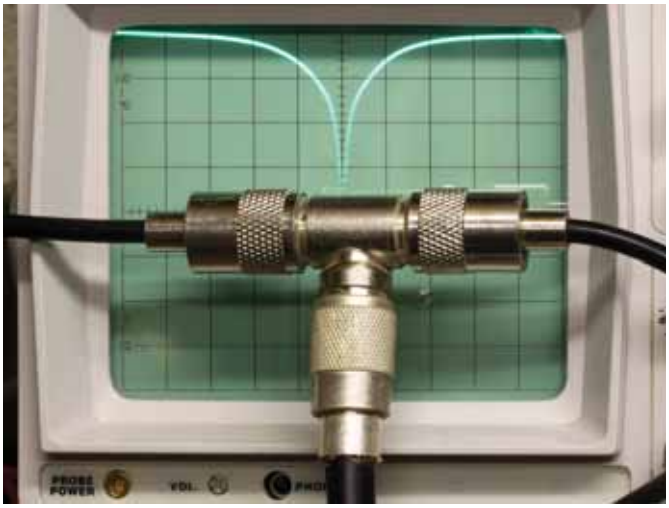

PHOTO 1: Testing a home-made stub filter on the spectrum analyser revealed a notch depth of well over 30dB.

EMC. Interference to or from radio equipment falls into the general category of electromagnetic compatibility (EMC). This is something of a misnomer where amateur radio is concerned: interference problems are usually due to an incompatibility rather than compatibility. For example, a stereo with poor immunity to RF might be said to be incompatible with amateur radio or, indeed, with any other radio transmitter that happens to be nearby. Such equipment is also likely to be vulnerable to interference from CB, police, taxi and other radio equipment. Interference problems are often caused by badly designed equipment. Even well designed equipment may cause problems if it is not properly installed or if it is operated incorrectly.

Most regulatory authorities set maximum limits for spurious emissions from amateur radio equipment. As an absolute minimum, you should ensure that spurious signals from your transmitter are well below the limits and guidelines specified by your licensing authority. Harmonics and other spurii in the VHF/UHF region could interfere with VHF broadcast radio, UHF TV and two-way radio systems. A well designed and adjusted HF transmitter is unlikely to interfere with distant VHF/UHF radio communications. Even where a transmitter is fully in compliance with regulatory requirements, RFI/TVI problems are likely to occur when radio and television receivers are in very close proximity to a transmitting aerial. A simple low-pass filter in the aerial feedline of your HF transmitter will ensure that your VHF/UHF harmonics are very well suppressed. A suitable filter was described in last month's Homebrew. Filters of this type are almost completely lossless at frequencies within the passband. The measured loss of my prototype is below 0.5dB from DC to 30MHz. Stopband attenuation is 52dB at 60MHz, >70dB from 75MHz to 250MHz and >60dB from 65MHz to 570MHz. There is no disadvantage to keeping such a filter in line at all times. RFI/TVI problems are rarely caused by a faulty transmitter, but it is always a good idea to make sure that your house is in order in case any problems arise.

There are several common causes of RFI/TVI. Mast mounted TV preamps can be very prone to overloading by strong signals from 2m or 70cm transmitters. Common mode RF current on TV aerial feeders can provide an easy path for RF to get into a television receiver. A very simple TV installation will have an aerial on the roof or in the attic that is connected to the TV by a long coax feeder. The mains earth or neutral line provides a low impedance path to ground where the TV power lead is plugged into the mains. This makes an ideal receive aerial for RF from a nearby transmitter. Unfortunately, this combination of a fairly long end-fed wire and a good ground connection also makes a very efficient transmitting aerial for propagating noise generated by the TV or any equipment connected to it. Modern TV receiving systems are often quite complicated with one or more TV sets, digital set-top boxes, cable TV connection, satellite receivers (which also have long coax feeders), distribution amplifiers, DVD or video recorders etc... Each of these separate units will have a power supply that is connected to the mains. The entire system forms a complex network of wires and ground connections. RF noise generated in any of the units is likely to be radiated via the mains wiring and aerial feeders.

Some broadcast radio receivers are quite prone to RFI problems. A typical receiver will be in a plastic case, which offers little or no screening of the circuitry inside. Even audio equipment that is not designed to receive radio signals can be prone to RFI. Poor screening of audio leads can lead to overloading of low level inputs. Speaker leads can make a good aerial for picking up RF. The classic stereo setup with the amplifier in the middle with one speaker on each side forms the speaker cables into a nice dipole for the HF bands. Cheap and nasty computer speakers are particularly prone to RFI problems, especially the occasional dum-diddy-dum-diddy-dum from mobile phones.

Where RFI is due to improper installation, it will often be possible to cure the problem by making a few simple changes. Using screened leads where they are required, re-routing cables to keep them away from the source of interference, adjusting the position of TV and radio aerials for better received signal strength can all help to cure or reduce interference. I remember one case where a TV was tuned to receive weak signals from a distant TV transmitter site. Simply re-tuning the TV to receive the same channels from a new local UHF transmitter completely cured the interference problem.

When interference is due to poor screening or bad equipment design, there will be fewer options available to the amateur. It is generally not possible or even advisable to make modifications to your neighbour's equipment. The best course of action is to try to keep the RF away from the affected equipment. Common mode current on TV aerial feedlines can be dramatically reduced by placing a ferrite core on the feeder and/or the mains earth lead. No modifications will be needed. If you use one of the special split cores that are designed for this purpose, you won't even need to remove the mains or aerial plugs so that you can fit the ferrite core over the cable.

SUPPRESSION AT SOURCE. Because of the large frequency difference between HF and VHF/UHF, it is relatively easy to suppress VHF/UHF harmonics from an HF transmitter. Suppressing harmonics and other spurii from VHF and UHF amateur transmitters can be more difficult. The second harmonic from a 6m (50MHz) transmitter can be particularly problematic because it falls in the middle of the VHF broadcast radio band (88-108MHz). A typical 6m transmitter will have second harmonic attenuation of somewhere between 50 and 70dB. This should be adequate for most situations. However, if a close neighbour is listening to a weak FM station on 100.2MHz, greater harmonic attenuation may be desirable. In the case of a 400W 6m station using a single ended valve amplifier with a PI output matching network, the situation could be much worse. Regardless of whether it is homebrew or commercially made, such an amplifier will typically have 2nd harmonic suppression of -40 to -50dBc (ie up to 40mW of 2nd harmonic). Clearly, additional filtering will be required if interference to nearby FM receivers is to be avoided. A simple fifth or seventh order LPF would improve harmonic attenuation by 30-50dB. This would be a perfectly satisfactory solution. However, there is an even easier way of removing 2nd harmonics from your transmitted signal.

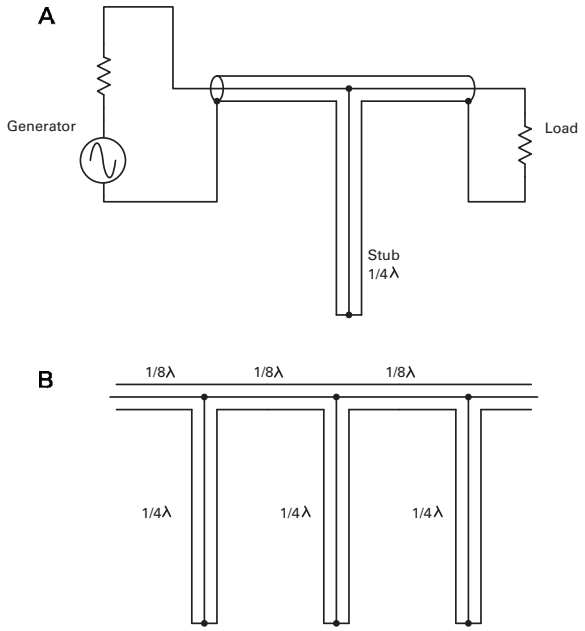

FIGURE 1: Notch filter configurations. (A) Using a quarter wavelength line as a notch filter. (B) Multiple stubs can be placed at 1/8 wavelength intervals to obtain a much deeper notch.

An open or short circuit length of transmission line can be used as a notch filter. A lossless quarter wavelength line with an open circuit at one end behaves like a short circuit at the other end. The same line with a short circuit at one end presents an extremely high impedance at the other end. A lossless half wavelength line with a short circuit at one end will behave like a short circuit at the far end. This is true regardless of the characteristic impedance of the line.

A COAXIAL STUB FILTER. **Figure 1A** shows how a quarter wavelength coaxial line can be used as a notch filter. The line length is a quarter wavelength at 50.1MHz. As the line is terminated in a short circuit at one end, the other end will appear as a very high impedance across the 50Ω line between the generator (transmitter) and load (aerial). This circuit behaves very differently at 100.2MHz, where the line is one half wavelength. The coaxial stub now looks like a short circuit across the line. My test circuit was based on a length of Westflex 103 coaxial cable. I used three PL259 plugs and an SO239 'T' connector where the stub filter is connected to the line. **Photo 1** shows my filter under test. I cut the coax stub to slightly longer than (75/f)*VF (where VF is the specified velocity factor, 0.85 for Westflex 103). I wasn't too surprised to discover that the resonant frequency was a bit lower than expected. I have yet to encounter a length of coax with an actual VF that is the same as the datasheet value. After trimming to resonance at 50.1MHz, the line length from the mating face of the PL259 to the open circuit end of the cable was 116cm. The distance from the mating face of the T connector to the centre line is about 2.5cm, giving a total line length of 118.5cm. A free space quarter wavelength is 75/50.1 = 1.497m. 1.185/1.497 gives a line VF of 0.791, at least for this particular length of line. There are several methods of measuring the resonant frequency of the coax stub. I used a spectrum analyser and tracking generator for this test. In some of our previous projects, I have used a simple GDO for the same purpose. If no test equipment is available, you can leave the stub end open-circuit and trim the line length for minimum received signal strength on your 6m receiver. Once the line is cut to the correct length, you can short circuit the open end of the line. This will move the notch from 50.1MHz to 100.2MHz. Filter losses at 6m are so low as to be unmeasurable. My single stub gives a notch at 100.2MHz of well over 30dB. **Figure 1B** shows how multiple stubs can be placed at 1/8 wavelength intervals along the line to achieve a much deeper notch. **Figure 2** shows a QUCS simulation of the single stub filter.

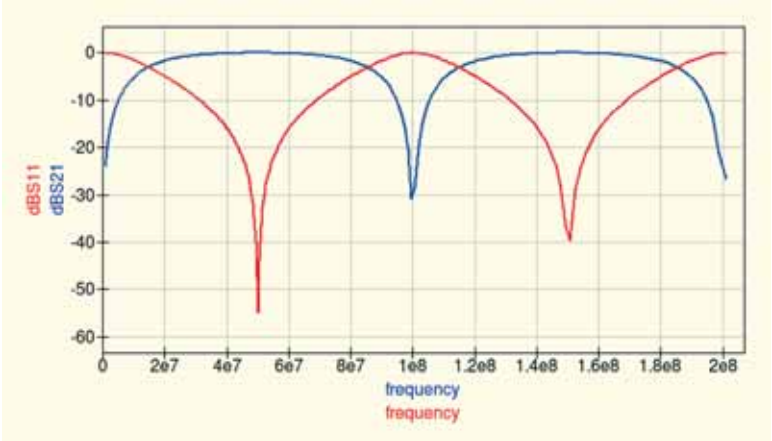

FIGURE 2: QUCS simulation of a single stub filter.

SOME RFI CASES ENCOUNTERED AT EI9GQ. First, a simple high pass filter. Three years ago, all was well in the EI9GQ living room. We had one main TV that was connected to the UHF aerial for the terrestrial channels and a satellite receiver that allowed us to receive the various free-to-air channels. Each of the other TV sets in the house had a simple whip or loop aerial that could only receive signals from the local UHF TV transmitter. A UHF TV preamp was used to boost some of the weaker signals from more distant stations. This simple system was remarkably immune to RF from my amateur transmitters. I could run the full legal limit from LF to VHF without any trace of TVI. This happy state of affairs came to an abrupt end when I replaced the aerial preamp with a new four way distribution amplifier. The new amplifier had good immunity to my HF signals, but running more than a few watts on 2m resulted in severe TVI. As the interference was equally bad on all of the four TV sets connected to the distribution amp, it seemed likely that the problem was caused by overloading of the TV preamp.

The TV aerial is connected to the amplifier by a very short length of coax. Placing a ferrite ring on this cable did nothing to solve the problem. DC power is fed to the amplifier via one of the four output cables. The power supply unit is well away from the TV aerial and my 2m aerial, so it is unlikely that RF is entering the amplifier via this route. Lifting the weatherproof cover of the amplifier revealed that the amplifier is inside a very well screened metal enclosure. The only I/O connections are via F-type coaxial connectors. I made up a very simple high pass filter, consisting of a pair of capacitors and one inductor in a T configuration. The filter circuit is shown in **Figure 3A**. The 6.8pF capacitors are disc ceramic types. The inductor is three turns of 1mm diameter copper wire wound on a 4mm former. This gives a centre to centre coil diameter of 5mm. Turn spacing is just under 1mm. This simple filter gives very high attenuation of HF signals below 30MHz.

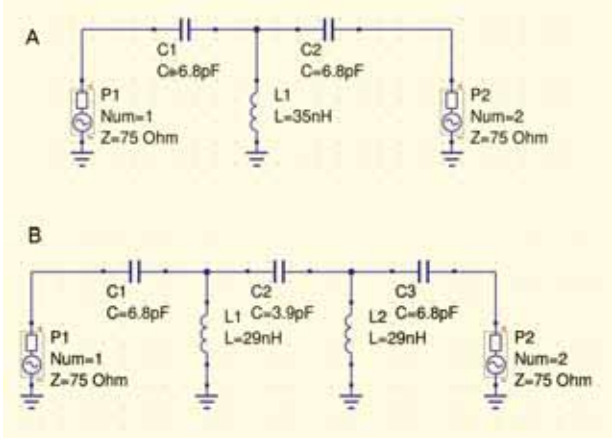

FIGURE 3: QUCS simulations of TV high pass filters. (A) Simple T configuration. (B) 5th order filter giving 30dB attenuation at 144MHz.

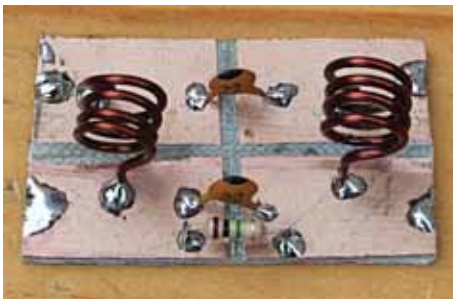

PHOTO 2: One of my prototype braid breakers (see Figure 4).

Attenuation at 144MHz is only about 10dB but, happily, this was enough to completely cure my TVI problem. The filter was built in a very haphazard fashion, by soldering the components directly to the ends of the coax cable at a point close to the amplifier input. As the aerial and the amplifier are both out of harm's way in the attic, my temporary lash-up is still exactly as it was left three years ago! **Figure 3B** shows a more elaborate 5th order high pass filter. This filter gives 30dB attenuation at 144MHz and 60-80dB attenuation of all HF signals.

A BRAID-BREAKER FILTER FOR UHF. I have recently been suffering from very severe QRM on the 160m band. The problem was traced to a TV set that is normally used as a monitor for a games console. Switching off the TV got rid of the QRM, but this left me with the problem of dealing with a very unhappy Xbox player. Unplugging the TV aerial lead provided a temporary solution. Obviously, a set without an aerial is not much use for watching TV programmes, but it still works fine for its primary purpose as a game console monitor. After several months of living with this compromise, I finally came up with a more permanent solution. A ferrite core on the TV aerial feeder gave some reduction in interference. The QRM on 160m was reduced from above S9 to about S7. This is a worthwhile improvement, but still not a satisfactory solution. It is easy enough to make an effective choke for HF or VHF, but a choke for the LF bands will need to have a very large value of inductive reactance. I could probably have cured this problem by placing a sleeve made from multiple ferrite

PHOTO 4: Wrapping my keyboard USB cable round a choke stopped it generating spurious characters.

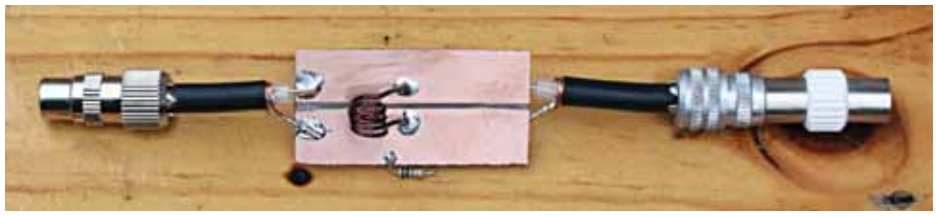

PHOTO 3: Simplified braid breaker using PCB tracks to provide the capacitance.

cores on the TV feeder. A simple high pass filter as used for the TV preamp won't work in this case because the interfering signals are being radiated by the outer conductor (braid or sheath) of the coax. A braid breaker type of filter is the best solution to this type of problem. **Figure 4** shows the schematic of such a filter. This is a balanced version of the classic 3rd order PI high pass filter. The value of L is chosen to have an inductive reactance equal to the line impedance. C has a capacitive reactance of half the line impedance. For a 75Ω filter with a cutoff frequency of 200MHz, suitable values for L and C are 60nH and 22pF. R is a high value resistor that provides a discharge path for any static build-up on the TV aerial. A value of 100kΩ to 1MΩ is suitable.

Several versions of the braid breaker filter were built. The circuit in **Photo 2** was built on a small piece of single sided PCB laminate. The PCB was cut into four copper islands of equal size using a hacksaw blade to cut through the copper foil. The components are mounted as shown in the photo. Both inductors are 4 turns of 1mm enamelled copper wound on a 5mm former. A pair of 22pF ceramic disc capacitors were used for C and a 1MΩ resistor was used for R.

As this is a simple filter with a very low loaded Q of 1, losses at frequencies well above the 300MHz cutoff will be very low. We can even afford to use a pair of non-ideal capacitors in this circuit. If the circuit is built on double sided PCB, the 22pF ceramic capacitors can be replaced by the capacitance between the top and bottom layers of the PCB.

A capacitor is a pair of parallel plates. The capacitance value depends on the area of the plates, the distance between them and the relative permittivity of the dielectric (insulating material). The formula for calculating the value of a capacitor is shown in **Figure 5**. The vacuum permittivity of free space is 8.854*10-12. The relative permittivity of

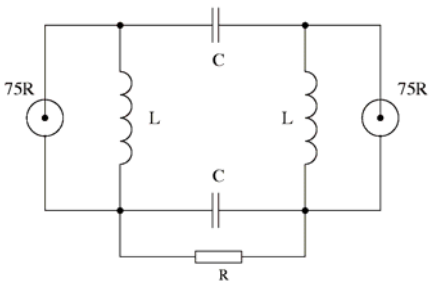

FIGURE 4: Braid-breaker filter for UHF.

FR4 or similar fibreglass board is about 4.7. Before building the filter, I did a few tests on some double sided PCB laminate (Maplin WF42). My PCB offcut is 153mm x 144mm. This is a plate area of 0.022 sq. m The dielectric thickness is 0.0016m. Using the Figure 5 formula, c = 8.854 x 10-12 x 4.7 x (0.022/0.0016) = 572.2pF. Direct measurement of the PCB using a capacitance meter shows a capacitance of 571pF. It is very rare to see such close agreement between theory and practice! These tests show that this type of board has a capacitance of just under 2.6pF per square cm.

The filter was built on a 3cm x 5.6cm strip of PCB. The copper foil is cut in half along the entire length of both sides of the PCB. This forms two separate capacitors, each having a capacitance of approximately 22pF. **Photo 3** shows the finished braid-breaker HPF. The two inductors are 60nH, as used in the previous design. One inductor is soldered to each side of the board as shown in the photo. Note that the input coax connection is to one side of the board, the output connection is to the other side of the board. The only direct connection between the top and bottom layers is the 1MΩ resistor. This filter has completely cured my 160m interference problem.

COMPUTER WOES. A new USB PC keyboard for the shack computer led to another RFI problem at EI9GQ. RF pickup on the keyboard cable caused random characters to be sent from the keyboard to the PC when I was transmitting on 160m. The high levels of RF in the shack were probably due to the fact that I was using an end-fed wire aerial. This led to a few embarrassing incidents when some of my friends received several pages of random gibberish from my instant messaging software! Wrapping ten turns of the keyboard USB lead around a high permeability ferrite toroid as shown in **Photo 4** completely solved this problem. The measured inductance of this choke is just over 300μH.

$$C = \epsilon_0 \epsilon_r \frac{A}{d}$$

FIGURE 5: Formula for calculating the value of a capacitor.

C is in Farads
ϵ_0 = permittivity of free space = 8.854×10^{-12}
ϵ_r = relative permittivity of dielectric
A is area in square metres
d is distance (plate spacing) in metres

RSGB Museum Surplus Sale

As previously announced in the October *RadCom* (RSGB Matters), over the next few months the RSGB will be placing a number of items that are surplus to requirements at the National Radio Centre on the eBay auction site. The best examples of equipment that showcases amateur radio communications over the years are being retained for part of the exhibition inside the NRC. Some examples of military equipment are going on loan to other exhibitions within Bletchley Park.

What remains is equipment that has been given to the Society over the years that is surplus to the plans for the National Radio Centre.

It ranges from coil winders to transceivers, amplifiers to microphones and home made equipment to headphones. Full details of the equipment that will be auctioned will appear on the RSGB website at www.rsgb.org/auction. Each piece of equipment has been photographed and described, the website will also tell you when this equipment will be put up for eBay auction so you don't miss the opportunity to bid for something you are interested in. The first auction will run between 25 and 31 October; check the RSGB website for details.

Here you will see just a few of the pieces you can bid on.

Icom IC720A all band AM/SSB/CW HF transceiver with general coverage receiver, no microphone. ICPS15 matching PSU.

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Check out **www.rsgb.org/auction** for full details of all the equipment to be auctioned and the dates that you will find this equipment on eBay.

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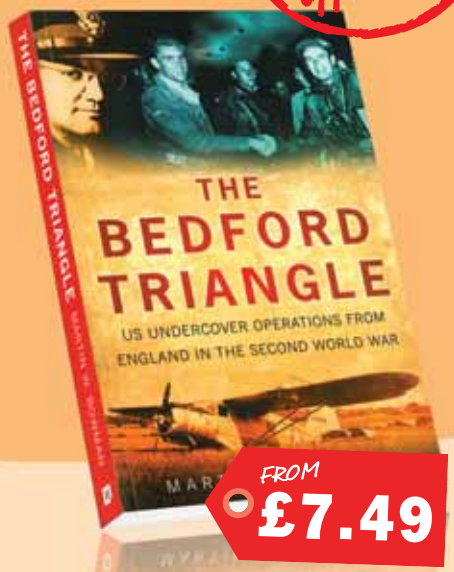


FROM £7.49

The Bedford Triangle

By Martin Bowman

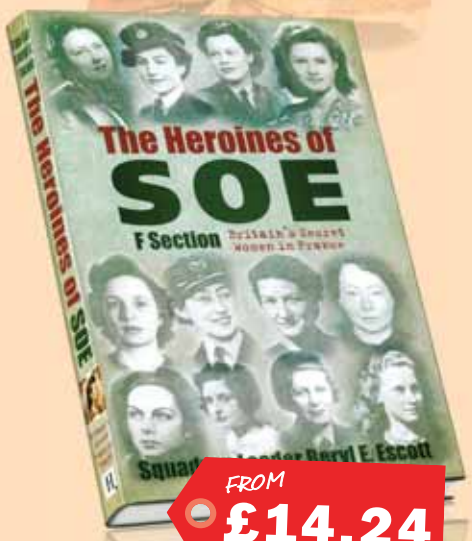
During WWII there was a part of the English countryside that had a reputation for those posted there simply disappearing including the famous band leader Glenn Miller. The Bedford Triangle is a book that tells the story of the activities carried out by the British Special Operations Executive (SOE), US Army Air Force (USAAF) and American Office of Strategic Services (OSS) in Bedfordshire during WWII.

The UK headquarters of the US Army Airforce Service Command, was located at Milton Ernest Hall and was at the heart of a network of top secret Allied Radio and propaganda transmitting stations, political warfare units and undercover British and American formations dealing in espionage and subterfuge. Drawing on revealing first-hand accounts, together with official documentary evidence the author's extensive research has revealed that Allied Secret Service organisations participated in even more unorthodox activities, such as clandestine propaganda and political warfare. For those interested in conspiracy theories The Bedford Triangle provides its readers with the shocking truth behind what really happened to legendary band leader Glenn Miller and his execution by the Allies.

During WWII Bedfordshire was a central part of the Allied clandestine activities against the Axis forces, The Bedford Triangle portrays this crucial role and is recommended reading for anyone interested in conspiracy theories and the Allied operations behind enemy lines in occupied Europe during WWII.

Size 124x199mm 240 pages, ISBN 9780-7524-5098-8

Non Members' Price £9.99 **RSGB Members' Price £7.49**



FROM £14.24

Heroines of SOE:
F Section: Britain's Secret Women in France

By Beryl Escott

The history of SOE's war in the shadows has been told many times and much is known about the men who fought in secret. However, less is known about the women who also risked their lives for Britain and the liberation of France. By 1942 Britain's Special Operations Executive (SOE) was in desperate need of new recruits for their dangerous missions in France and they turned to a previously unexplored group – women. These female recruits came from all levels of society and were often motivated by an idealistic love of France and a desire to play a part in its liberation. Many displayed unexpected qualities and were good leaders, others showed astonishing courage through terrible privations, and many of them died bravely and painfully.

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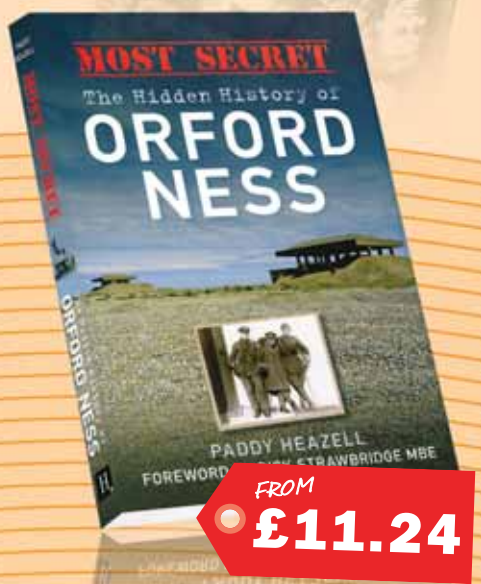

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Most Secret:
The Hidden History of Orford Ness

By Paddy Heazell

Orford Ness was so secret a place that most people have never even heard of it. Yet this remote stretch of the Suffolk coast has seen the development of Radar, testing of atom bombs, Secret US projects and much more in its eighty year history. This book details how Orford Ness developed from its WW1 origins testing and developing all manner of aerial weaponry through to highly secret radar projects of the cold war. From highly secret radar systems through the hand held WW1 bombs, bouncing bombs, rockets and even Cold War Atom bombs (without fissile material) and even the top-secret UK-US COBRA MIST project are all part of the Orford Ness history.

The role Orford Ness played in inventing and testing was crucial over the course of the twentieth century and this book published in conjunction with the National Trust recounts the history of one of Britain's truly historic sites.

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ATV

We focus on cables

CREATING A STATION. Logically, the most likely reader scenario has been to purchase or build a 23 or 13cm receiver and possibly the accompanying basic transmitter. The next stage is to find appropriate antennas and peripherals such as video monitor and audio amplifier for the receiver (a TV with A/V or SCART input being one solution) and, for the transmitter, a camcorder or similar. Consideration may also be given to RF power amplification. Then there is receiver/transmitter RF switching and control. Eventually all of these items will be considered but a receiver and basic transmitter are rather limited without an antenna and its directly associated RF feeder cable!

Antennas must be 'broad-band' for ATV, particularly so for analogue signals and for the bands above 70cm. Generally speaking, antennas used for narrowband SSB & FM operating are not suitable for ATV. One 23cm antenna from a well respected manufacturer has a -3dB bandwidth of 18MHz. It's fine for narrowband operations, but not ATV. Many such antennas are made with small diameter elements. Snow and even light rain can significantly detune these, reducing performance.

There are numerous types of antenna suitable for ATV, although they're not often off-the-shelf at a local emporium. Proven examples include the 3-6dBd omnidirectional Alford Slot, 'directional' and waveguide slots, 10-15dBd 'plate' antennas, 10-20dBd wide band Yagis and various parabolic dish and 'back-fire' configured antennas. There is just too much information to fit into this ATV column, especially if practical construction details are included, so in due course I hope to publish a separate article on Antennas for ATV.

CABLES. In the meantime, what about suitable RF cables? This is, unfortunately, an area where, generally, the more you pay the better the results. However, there are several approaches to the way you use RF cables that help provide good performance and minimise costs.

The larger the diameter of an RF cable the lower the losses but, as frequency increases, a 'waveguide' condition can occur in the cable. This leads to an 'HF cut-off', limiting the cable diameter for a given frequency. The dielectric/insulating material, capacitance, inductance and resistive losses also affect cable performance. A cable has a given maximum frequency and maximum power level – but you're unlikely to approach these below 5GHz on an amateur budget.

To minimise RF loss as well as cable cost, use the shortest possible cable length. There are several ways this can be achieved. The transmitter and receiver can be mounted up the mast within a few meters of the antenna(s). There are several problems with this, including weight and weather protection, although it helps with PA cooling. You'll also need low loss video, audio, power and control cables.

Frequency control is not too much of a problem – the I^2C signals to (for example) Comtech transmitters/receivers can be buffered over a surprising distance using the right driver ICs. Video and audio can be carried on small diameter RF cables, as the maximum frequency is normally below 5MHz. An alternative arrangement is to have the transmitter and receiver in the shack, with the RF pre- and power amplifiers up the mast. This reduces the number and quality of the RF and other cables required.

PHOTO 1: Main types of RF cable in use for ATV: l-r RG58, RG213, LMR400, Ecoflex15, LDF4-50.

A compromise way of saving cable losses is to locate the RF equipment in the loft. Video, audio and control cabling (or low power RF) etc can be brought up from the shack. One advantage is that it could be easier for maintenance – and it significantly helps with weather protection.

Table 1 shows a selection of cables in general use for ATV and their performance in selected amateur bands. Attenuation is quoted in dB per 10 metres. This is not always the case when searching for RF cable information; be sure to check before comparing figures from different sources. (Loss figures in Table 1 assume a VSWR of 1:1. Higher VSWR will increase losses. One useful website for cable loss calculation is www.ocarc.ca/coax.htm).

For overall performance, Ecoflex15 is probably the best contender. Cables such as LDF4-50 and 5-50 are often available on the surplus market, but the current cost of copper may have reduced availability. All the RF cables suitable for ATV need special-to-cable connectors. Their cost can be a deciding factor; for example, when buying surplus LDF cables, N type connectors can be £15-25 each – even as surplus.

New Ecoflex15 cable typically costs £5-6/metre (plus tax and carriage) and is usually only available in 10m minimum length. One good point with Ecoflex15 is that its minimum bending radius is 70mm, a great advantage when routing the cable into a building. Apparently there is a high quality solder-free N connector that has been specially developed for Ecoflex15. It is possible to modify 'standard' N connectors for several of the lower loss cables quoted in Table 1, however, this requires a high level of skill and workshop facilities.

Photo 1 shows the physical construction of these cables. Ecoflex cables have a PE-coated copper foil, and copper braid. LMR cables have an adhered aluminium foil and close weave copper braid. This gives a high immunity to RF leakage and pickup. A word of warning: there are cables that have a wound, non-adhered copper foil inside a loose weave copper braid. The foil is prone to fracturing with only a small degree of regular movement, losing continuity and performance. LDF cables have a solid copper sheath/screen, corrugated to provide a degree of flexibility.

CONTROLLERS. Several readers have asked me about the controllers used with the Comtech modules (as mentioned in the last column). My first response was "Which one?". There are several available, some include receive/transmit sequential switching. Yes, I do have preferences – along with those I make up myself. One contact suggested a particular PIC controller he was producing. This deserves a mention as it is specific to just the sequential switching control, making it a useful addition for switching PAs etc for applications other than ATV. I hope to review this unit in the near future. So the next column will jump to controllers and be followed by transmitter power amplifiers.

TABLE 1: Performance of various coaxial cables. (n/a = information not available).

Type	Impedance	Diameter	Velocity factor	Max frequency	433MHz dB/10m	1.3GHz dB/10m	2.4GHz dB/10m
RG58C/U	50Ω	5mm	0.66	n/a	4.28	8.93	13.87
RG59B/U	75Ω	6.1mm	0.66	n/a	2.44	4.54	6.53
RG213/U	50Ω	10.3mm	0.66	n/a	1.48	2.79	4.75
RG214/U	50Ω	10.8mm	0.66	n/a	1.47	2.7	4.65
Ecoflex15	50Ω	14.6mm	0.86	6GHz	0.61	1.14	1.63
LMR200	50Ω	3/16"	0.83	16GHz	2.19	3.8	5.08
LMR400	50Ω	3/8"	0.83	8GHz	0.83	1.45	1.93
LDF4-50	50Ω	1/2"	0.88	8.8GHz	0.47	0.84	1.18
LDF5-50	50Ω	7/8"	0.89	5GHz	0.26	0.48	0.68

Earth Observation for the Radio Amateur

As more amateurs become interested in propagation, studying the weather can provide extra information

NOAA polar orbiter image of the UK in July 2000. This image combines visible channel and the thermal channel data to produce a false-colour result. The 4km resolution of the APT data has been interpolated to 2km for this image. You can see the darker areas of the major urbanised areas (due to relative lack of vegetation). This data was recived directly. (C) EUMETSAT and NOAA, 2000-2010.

INTRODUCTION. Whether you just want to watch weather systems across the world, tackle the challenges of the new digital transmission formats, use some of the vast amount of data now easily available to help time your astronomy, sun-bathing activities or predict propagation, or simply experiment with the RF side, there's something in weather satellites to help you enjoy your hobby.

There are two types of weather satellite in orbit today that the amateur can receive – polar orbiters and geostationary.

POLAR ORBITERS. The first weather satellites were polar orbiting satellites carrying television cameras, but although today's satellites have a similar orbit, they carry a much wider range of instruments, including a 5-channel radiometer (called the AVHRR) providing both visible waveband and thermal waveband data. These satellites are in a relatively low orbit (around 800km) and have instruments providing resolution down to about 1km at the sub-satellite point. They carry 137MHz and 1.7GHz transmitters. The VHF transmission is of sufficient strength and narrow bandwidth that a tracking antenna is not required. The orbit is set so that the satellite is 'sun-synchronous', which means that it passes over the same point on the earth at the same time every day. In practice, two or three passes will be within range and you will get both a set of daytime and a set of nighttime passes. To provide more coverage across different times of day, satellites passing both during the morning and during the afternoon have been launched, so that in practice you can get several sets of data per day.

GEOSTATIONARY SATELLITES. The snag with polar orbiters, though, is that, even with several active satellites, you don't get continuous time coverage, so that you can't see the development of weather patterns as easily. To provide such coverage there are a number of geostationary weather satellites now operational and these satellites appear to be at a fixed location when viewed from the earth, hence they can provide day and night coverage of the region within their field of view. To provide worldwide coverage requires multiple satellites and today there are six main satellite groups covering the Americas, Europe and Africa and Asia operated by a number of different agencies, giving complete 24-hour coverage of the entire globe (except the regions near the poles).

RECEIVING POLAR ORBITERS. APT (Automatic Picture Transmission) is transmitted on the 137MHz band. The APT signal has been limited in bandwidth at the satellite by transmitting a reduced 4km resolution data from just two channels, rather than the full five-channel, 1km resolution data of which the satellite is capable. The digital data is converted to an audio-bandwidth analogue signal, used to amplitude modulate a 2400Hz carrier, which is then used to frequency modulate the satellite VHF transmitter. This makes the whole system more robust and less sensitive to Doppler shift during a pass.

Receiving the 137MHz transmissions is relatively easy. An omnidirectional antenna such as the turnstile can be used and amongst both homebrew amateurs and professional installations the QFH antenna is popular for its good response and added gain at low angles. There is a list of QFH references on my website **[1]**. As the signal bandwidth is some 35kHz, a scanner is not usually suitable. There are many receiver designs available for home construction, or you can buy a receiver such as the R2FX **[2]**, which is ready for computer control to automatically switch channels for the next incoming satellite. One problem in the UK is the presence of pager transmissions on 137MHz+, which means that you may be trying to receive a weak signal from space, while having a high-power pager transmitter on frequencies only a few tens of kHz away. Good band-planning by the UK authorities, eh? This may call for some good filtering, or for a receiver with very good strong signal performance. Luckily, such a receiver is available commercially in the R2ZX, which costs slightly more than the basic model.

Today, decoding the APT signal is almost universally done in software. There are a number of programs available to do this, with different emphasis – some on decoding alone with the best possible quality, others including the ability to upload automatically to your own website.

LRPT ON 137MHz. APT is due to be phased out on future weather satellites, and replaced with Low Rate Picture Transmission (LRPT), which should provide more data at a higher resolution. There is just one satellite sending LRPT at the moment, and there have been some successful amateur reception and decoding of this signal. It seems that the standards being used for this signal are still being developed.

HRPT RECEPTION ON 1.7GHz. The High Resolution Picture Transmission (HRPT) data is a digital data stream and today you must build your own system as there are no manufacturers left supplying the amateur market. The wider bandwidth of this signal

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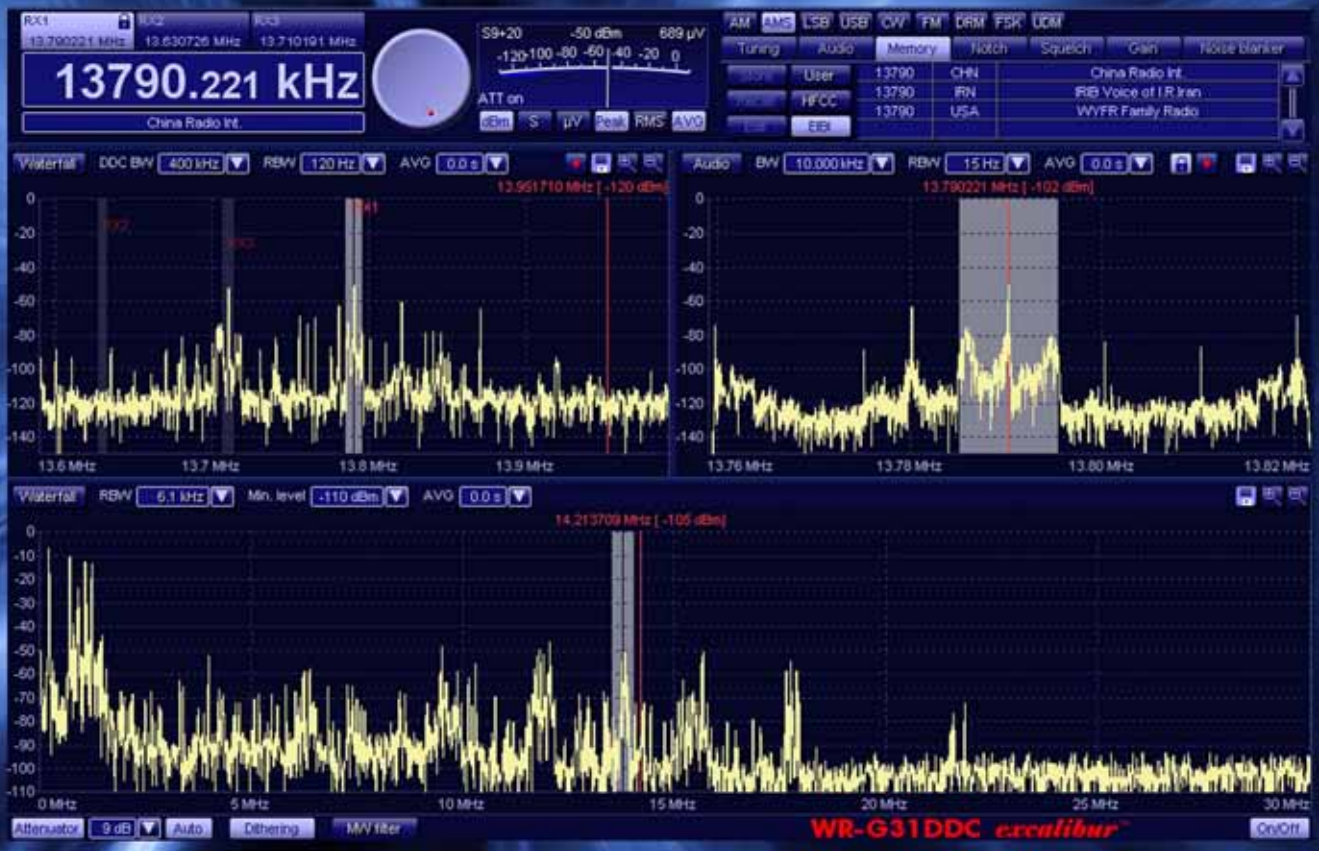

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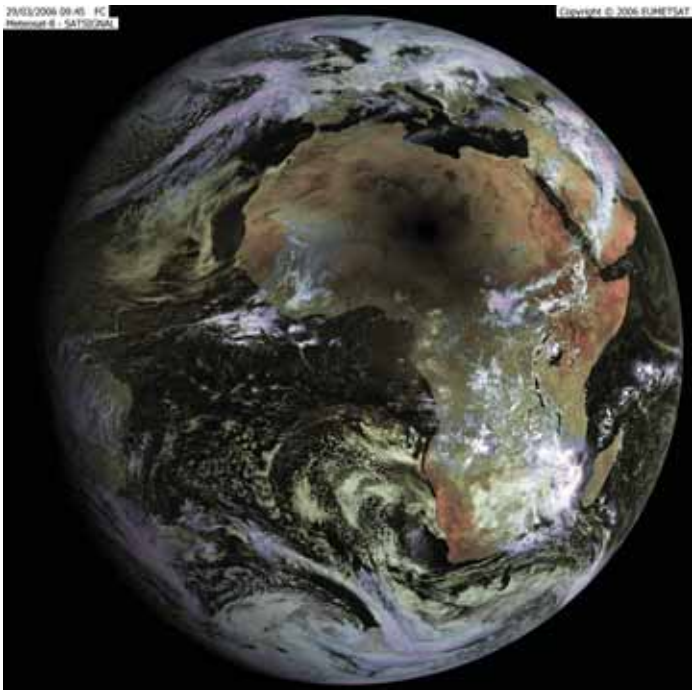

Full-disk image from the zero-degree geostationary satellite received over EUMETCast. The dark area over Africa is from the solar eclipse in March 2006. This data can be animated to show the progression of the moon's shadow. (C) EUMETSAT and NOAA, 2000-2010.

Late in 2009, data from the MODIS/AQUA polar orbiter was added to the EUMETCast data stream. This image was processed to show the snow that paralysed much of Eastern England on 10 December. (C) EUMETSAT and NOAA, 2000-2010.

(it provides five channels at 1km sub-satellite resolution) means that you need a higher signal level at the receiver for error-free reception and so some form of tracking antenna is required – a helix or dish (typically 90cm) is often used. I have seen the satellite tracked by hand, but this was only for a demonstration! To discuss HRPT reception, I suggest joining a Yahoo group such as GEO-Subscribers. You will find some hardware details on Rob Alblas' website **[3]**, including decoding software. You will also need software to driver your antenna tracker. Many people use my free WXtrack software. I offer an HRPT Reader program (in both free and registered versions) that can manipulate the five sensor channels in a variety of ways such as displaying derived dust and ash images.

AHRPT RECEPTION ON 1.7GHz. Advanced High Resolution Picture Transmission (AHRPT) is similar to HRPT, but of even greater bandwidth, presenting even more of a challenge for reception. In addition to the five channels at 1km resolution, there are several extra instruments providing advance atmospheric measurements. Currently, I know of no amateur reception – so there's a chance for you to be the first. This format is in use on the Metop-A satellite, provided by the European agency EUMETSAT, which provides the morning polar orbiter coverage. The transmitter on this satellite is only switched on over a limited region of the earth to limit the chance of radiation damage. The critical component responsible for this radiation sensitivity has been replaced for the follow-on polar orbiting satellites – Metop-B and Metop-C.

RECEIVING GEOSTATIONARY INFORMATION. Historically, the geostationary satellites used a very similar APT system to that of the 137MHz polar orbiter transmissions, making reception the relatively simple process of setting up a dish or helical antenna and perhaps using a down-converter in front of an existing APT receiver. However, the last WEFAX transmission was closed down some years ago.

The analogue WEFAX transmissions have now been replaced by digital transmissions with two different bandwidths, called Low Rate Information Transmission (LRIT) and High Rate Information Transmission (HRIT). Amateurs are just getting to grips with LRIT data, and Ed Murashie has published a series of articles in the Group for Earth Observation's quarterly magazine, GEO, describing his system.

Fortunately, although receiving some of the newer weather satellite formats is currently challenging, much of the data is now being sent over commercial broadcast systems such as those used for domestic satellite TV. Instead of sending digital video over the Ku-band (11GHz) link, digital data is sent instead, albeit with perhaps rather more protection against corruption than might be required for a TV soap opera! In regions where the outages due to rain and other weather phenomena might be excessive, the lower frequency C-band may be used instead. The most developed system is that in Europe, called EUMETCast, and other similar systems are developing in the Americas and Asia. The USA also has a satellite broadcast system called NOAAPORT.

EUMETCast carries all of the 12 channel high-resolution SEVIRI data from the zero-degree geostationary satellites (Meteosat-8 and Meteosat-9) covering Europe, Africa, and parts of the Indian and North & South Atlantic Oceans, with a repeat cycle of both 5 and 15 minutes. This includes visible waveband data with a 1km sub-satellite resolution. In addition, data from the main geostationary satellites across the world is relayed on an hourly basis, giving you global coverage. But there's more! The system also provides worldwide coverage of 1km resolution, polar orbiter Metop AHRPT data and an extended regional coverage of NOAA HRPT data received by several stations in Europe, providing near-real time reception, without the need for your own tracking antenna. All this is in addition to many meteorological and environmental datasets. As this easy-to-receive data is free to amateurs and education, you will understand just why it is so very popular!

In Africa, and South and North America, a subset of the data is available from a C-band (3.4GHz) service. In Europe, reception requires a satellite TV dish and either a card or USB box to convert the digital video signal into data that can be handled by the PC. The recommended dish size is 85cm, but many find a 60cm dish just adequate. EUMETSAT supply the TelliCast software to convert that data into files and the files can then be processed into images, animated and so on by further software. Both free and paid-for software is available. Examples of the decoded and processed data accompany this article.

One data set that I have yet to see used by amateurs is the radio occultation data from

the GRAS instrument. This measures the way in which signals from the GPS satellites disappear as they set and rise by the earth's limb as seen from the polar orbiter. This provides data on the ionosphere, and could perhaps be used a predictor of good conditions. Is anyone up for that challenge?

USER GROUPS. There are a couple of active user groups that you will want to join if you get interested in Earth observation. The groups actually work closely together, even though one is based in the UK and the other in The Netherlands.

Group for Earth Observation (GEO) [4] has been running for about seven years and has served its members in a variety of ways, including giving live demonstrations at numerous rallies and similar events across the UK. It publishes a high-quality quarterly magazine with articles from members, from various space agencies, and stunning images from across the world. GEO has organised a visit to the headquarters of EUMETSAT and ESOC, and presented many lectures to AMSAT and other groups. A GEO representative attends the Ofcom UKSG7 science users' spectrum frequency planning/co-ordination committee.

Werkgroep Kunstmanen [5] is based in the Netherlands and takes advantage of the compact size of that country to meet several times a year in Utrecht where a variety of projects are progressed. They have a very active membership and they publish a magazine (in Dutch) several times a year. You will find their antenna measurements are well done and very thorough, and a joy to read about.

WEBSEARCH

[1] Software from David Taylor: www.satsignal.eu/software/wxsat.htm
[2] R2FX and R2ZX are available from GEO: www.geo-web.org.uk/shop.html
[3] Software from Rob Albas: www.alblas.demon.nl/wsat/software/soft_msg.html
[4] Group for Earth Observation: www.geo-web.org.uk
[5] Werkgroep Kunstmanen: www.kunstmanen.net/

USEFUL INFORMATION

European satellites: www.eumetsat.int/Home/index.htm
NOAA polar orbiters: www.ncdc.noaa.gov/oa/pod-guide/ncdc/docs/klm/index.htm
QFH references: www.satsignal.eu/wxsat/equipment.htm#QFHlinks
APT Decoder: www.poes-weather.com/
SatSignal: www.satsignal.eu/software/satsignal.htm
WXSat: www.hffax.de/html/hauptteil_wxsat.htm
WXtoImg: www.wxtoimg.com/
Jakub Hruska: www.r00t.cz/Misc/LRPT
http://web.aanet.com.au/~ospiropo/meteor/lrptpage0.html
GEO-Subscribers: http://tech.groups.yahoo.com/group/GEO-Subscribers/

Using the MODIS data, James Brown was able to process this image over Iceland from 6 May 2010 to ephasise the volcanic ash from the Eyjafjallajökull that caused so much disruption to air travel. Interestingly, the dark trails at the top of the image are from aircraft, showing that this particular processing of multiple thermal channels can help distinguish between multiple dust-like features in the atmosphere. (C) EUMETSAT and NOAA, 2000-2010

Rob Alblas website: www.alblas.demon.nl/wsat/index.html
HRPT Reader: www.satsignal.eu/software/hrpt.htm
WXtrack software: www.satsignal.eu/software/wxtrack.htm

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Antennas

More on G3LDO's small loop testing methods

PHOTO 1: ZL1VL's 400 sq ft (37m²) of galvanised chicken wire counterpoise system, which gave a definite all round improvement to the performance of the Hustler 6BTV.

ANTENNA COMPARISON TESTING AND *WSPR*. In the January Antennas I described the experimental work of Walter Blanchard, G3JKV, who was testing a Hustler 6BTV on behalf of the Dorking Amateur Radio Club. Most of this work involved trying different radials and ground systems and conducting comparative performance tests.

This description brought a surprising amount of e-mail and an example was published in March Antennas; the experiences of Duncan Tribute, G1OEQ and his Hustler 6BTV, which he uses from a restricted site in Truro.

LETTER FROM NEW ZEALAND. Additionally Vince Lear, ZL1VL (ex G3TKN), sent me details of experimental work comparing a ground mount Hustler 6BTV vertical against full sized inverted V's for 20, 30 and 40m at apex heights of 29ft (9m). He goes on to say "I live in a typical suburban environment in Auckland and the aerial is not out in the clear, so my results are probably fairly typical of what the average ham can expect living in these sort of surroundings. The low height of 29ft is also probably typical for most hams with restricted space.

"When rapid switching of different antennas takes place (especially when one is a vertical and the other a horizontal) there will always be times when one antenna may have an advantage over the other depending on time of day, propagation conditions and of course distance. Sometimes the advantage can swing back and forth by the minute. The results below are a broad summary to give an overall idea of what I found was happening most of the time.

"20m: I found the inverted V dipole to be consistently better on just about every station; sometimes 2 S-units and sometimes more. On one short path QSO to G the Hustler got a 4/2 while the inverted V was 5/6 although the inverted V had a greater signal to noise ratio. GM3PPE in Kelso who also runs a Hustler did similar tests a while back and found his 20m inverted V at 30ft (9.1m) to be around 10dB better on average in the broadside direction compared to his Hustler at all ranges. His Hustler was mounted clear of obstructions.

"30m: There were times when the inverted V was slightly better (especially up to JA) but overall the two antennas seemed about equal on Europe and Stateside.

"40m: The Hustler was the clear winner at DX as obviously an inverted V at 29ft (9m) is just too low. In the late afternoon on the long path to Europe there were some weak EUs that could be copied on the vertical that were virtually inaudible on the inverted V.

"80m: I have not compared the Hustler with any other antenna at this QTH, but it has proved itself on DX at distances up to 5000 miles (JA) running just 100W.

"I feel if one is living in a suburban environment, ground mounted verticals are to be avoided on 14MHz and higher frequencies. However, they can work well on frequencies below 10MHz given a good ground. My original ground system comprised some 20 radials around 20ft (6m) long. This radial system was replaced with 400 sq ft (37m²) of galvanised chicken wire mesh, see **Photo 1**. At that point, I felt there was a definite all round improvement in the performance of the Hustler 6BTV. There was a reduction in the base impedance of the vertical showing lower earth losses with the wire mesh.

"Finally, I thought I would experiment with a 20m ground plane (spaced well away from the Hustler) using 2 quarter wave radials and with its base elevated 13ft (4m). The elevated GP was noticeably better than the Hustler by 1 and sometimes 2 S-units but I still felt the 20m inverted V at 29ft (9m) was better than the GP. I had taken the 20m inverted V down, so I was not able to do direct comparisons between the GP and the inverted V."

ANTENNA PERFORMANCE COMPARISONS. Some of you may be aware that a method I used to make comparison tests on antennas has been the subject of discussion, so in this column I will explain antenna testing in general and my QTH in particular.

The general layout of one half of my back garden is shown in **Photo 2**. The loop antenna in the foreground is being compared with the multiband rotary dipole on the roof.

The loop was mounted 2m above the ground well away from the house via a feeder comprising 43m of RG213 and 10m of RG58. The comparison antenna was an 11m high multiband rotary dipole on top of the house fed via 15m of RG213. This gave the dipole an obvious advantage but, in spite of this, the loop did very well on short skip contacts. Sometimes the loop gave the best results, other times the dipole did best although DX signals on the dipole were 2 to 3 S-points ahead of the loop.

As reported in September, VK5KLT [1] had some interesting findings and comments regarding the best location for a transmitting

TABLE 1: Part of the edited G3LDO transmission data from the *WSPR* web

Time	Frequency	SNR	Call	Locator	km	miles
QUAD						
14:52	14.097161	-15	NB3N	FM19ki	5875	3651
14:48	14.097149	-9	W3GXT	FM19ol	5844	3631
14:48	14.097199	-14	W0OGH	DM43ci	8502	5283
14:48	14.097163	-5	NB3N	FM19ki	5875	3651
14:40	14.097148	-15	W3GXT	FM19ol	5844	3631
14:40	14.097200	-11	W0OGH	DM43ci	8502	5283
DIPOLE						
14:32	14.097161	-18	NB3N	FM19ki	5875	3651
14:32	14.097156	-19	WA8KNE	EM90gg	6846	4254
14:26	14.097153	-18	KF1Z	FN33na	5282	3282
14:26	14.097128	-21	WA3DNM	FM29fw	5728	3559
14:26	14.097156	-20	WA8KNE	EM90gg	6846	4254
14:18	14.097197	-23	W0OGH	DM43ci	8502	5283

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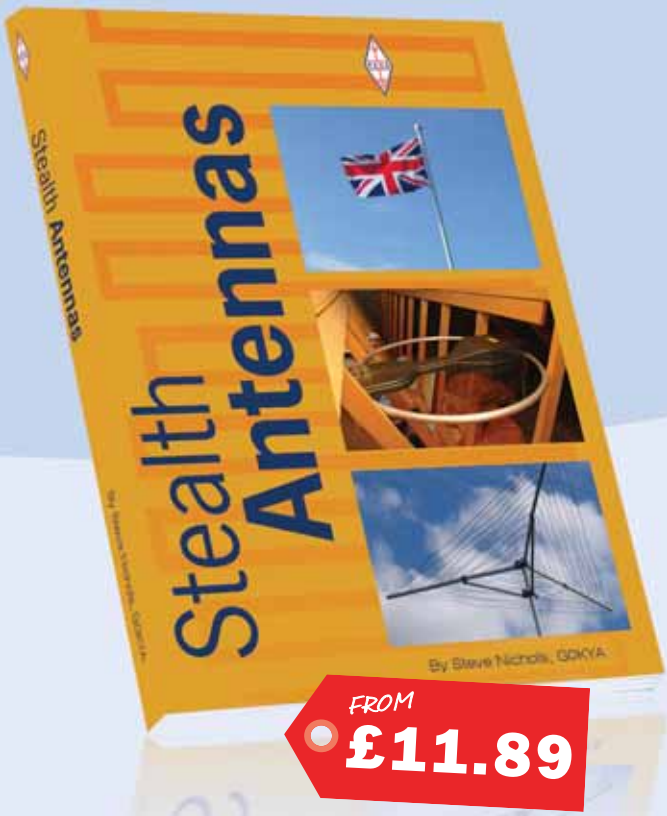

FROM £11.89

Stealth Antennas

By Steve Nichols, G0KYA

Tiny postage stamp-size gardens, intolerant neighbours, planning permission problems, living in apartments: these are some of the challenges facing the modern radio amateur when trying to get on the air. *Stealth Antennas* offers clear practical advice to those who might have thought they were unable to put up a suitable antenna.

Some think of amateur radio antennas and expect a 100ft steel lattice tower bristling with polished aluminium beams. For the rest of the radio amateur world, *Stealth Antennas* offers a wide range of antenna solutions to get your signal out. From using house rain gutters and drain pipes, or a magnetic loop in the loft, through to a tuned loop around the window frame a wide range of ingenious solutions are offered. Designs include magnetic loops, tuned wire loops, small verticals, zig-zag loaded dipoles, the W3EDP wire antenna, and even controversial designs such as the EH antenna. There are even reviews of a number of commercially-made stealth antennas. *Stealth Antennas* also looks at the best way to work DX with a modest station.

Stealth Antennas does not neglect VHF/UHF antennas. While easier to conceal because of their small size compared with HF antennas, what are the effects of mounting a VHF antenna in the loft? Roof tile absorption is discussed, as are the effects of detuning caused by copper water pipes or house wiring.

Many amateur radio operators are faced with the fear of interference being caused to televisions, telephones, hi-fi systems and anything with a plug on it. In these circumstances a stealth antenna may be the solution to allow you to get on the air or even the answer to your planning difficulties. *Stealth Antennas* has lots of original and ingenious antenna ideas for radio amateurs who might have thought they were radiationally-challenged.

If you are able to put up a 100ft tower and 6-element beam this book may not be for you. For the rest of us, *Stealth Antennas* should persuade anyone with an amateur radio licence that they can work the world without a beam, tower and linear amplifier.

Size 240x174mm, 208 pages, ISBN 9781-9050-8666-5

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Edited by Fred Handscombe, G4BWP

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loop antenna and that the bottom of the loop does not need to be more than a loop diameter above ground. He also noted that there is no significant improvement in performance when a small loop is raised to great heights; all that matters is the loop is substantially clear of objects in the desired direction of radiation and that mounting on an elevated roof ground-plane yields excellent results.

The important point is that "the loop should be substantially clear of objects in the desired direction of radiation". As you can see from **Photo 2** this isn't the case. I hope to repeat the comparison with the loop mounted on the flat roof of the house extension and fed with a short length of RG213.

WSPR. There is another interesting way that you can use to check the comparative DX performance of antennas. G3JKV mentioned the use of *WSPR* in the January Antennas. For those of you who have never heard of this before, *WSPR* (Weak Signal Propagation Reporter) **[2]** is a free software application that can enable your station to send and receive signals from similarly equipped stations worldwide.

The *WSPR* transmission contains the transmitter's callsign, locator and power (in dBm). Once set up, operation of *WSPR* is completely automated. The software logs every transmission you make, as well as all the decoded signals received.

Because participating stations usually upload signals that they receive in real time to a web server, you can find out within seconds of the end of each transmission exactly where and how strongly it was received. It is these reports that are of interest. My *WSPR* signals are shown in **Figure 1**. The station reporting the signals, together with location and distance from my QTH, are shown in each row. The most important information, the received signals, are reported as SNR (signal to noise ratio), rather than a specific signal level. Remember that these signals are very weak, often way below what is audible in the CW mode.

ANTENNA TESTS USING *WSPR*. I decided to use *WSPR* to compare the multiband trapped dipole on the roof with my multiband quad (located behind the camera that took Photo 1). These antennas have been in use for some time so I had a fair idea of their relative performances and the tests were more to assess how well *WSPR* performed as an antenna performance-measuring tool. *WSPR* can collect a considerable about of data in a short space of time so some method of selecting and processing the data is necessary.

G8JNJ has used this method, which he describes as follows: "What I do is transmit on one band with one antenna on a specific frequency, then swap antenna and frequency on the same band. I then download all the stations that have spotted me over a few hours from the *WSPR* website database.

						Power		Reporter		Distance	
Date	Call	Frequency	SNR	Drift	Grid	dBm	W	by	loc	km	mi
2010-09-02 13:58	G3LDO	14.097160	-19	-3	IO90st	+37	5.012	NB3N	FM19ki	5875	3651
2010-09-02 13:58	G3LDO	14.097158	-21	-3	IO90st	+37	5.012	DF2LV	JO44rs	798	496
2010-09-02 13:52	G3LDO	14.097155	-21	-4	IO90st	+37	5.012	WA8KNE	EM90gg	6846	4254
2010-09-02 13:52	G3LDO	14.097152	-13	-3	IO90st	+37	5.012	4X1RF	KM72ls	3504	2177
2010-09-02 13:52	G3LDO	14.097164	-26	-3	IO90st	+37	5.012	WO8LD	EM37jc	7081	4400
2010-09-02 13:52	G3LDO	14.097164	-14	-3	IO90st	+37	5.012	IZ6QIB	JN62qi	1411	877
2010-09-02 13:52	G3LDO	14.097197	-21	-3	IO90st	+37	5.012	W0OGH	DM43ci	8502	5283
2010-09-02 13:52	G3LDO	14.097146	-22	-3	IO90st	+37	5.012	W3GXT	FM19ol	5844	3631
2010-09-02 13:52	G3LDO	14.097150	-15	-3	IO90st	+37	5.012	M0ORE	IO90er	83	52
2010-09-02 13:52	G3LDO	14.097181	-16	-3	IO90st	+37	5.012	N6QW	CN88ob	7725	4800
2010-09-02 13:52	G3LDO	14.097164	+4	-4	IO90st	+37	5.012	8S1CW	JN65tm	1196	743
2010-09-02 13:52	G3LDO	14.097126	-21	-3	IO90st	+37	5.012	WA3DNN	FM29fw	5728	3559
2010-09-02 13:46	G3LDO	14.097156	-2	-3	IO90st	+37	5.012	DF2LV	JO44rs	798	496
2010-09-02 13:46	G3LDO	14.097150	-16	-3	IO90st	+37	5.012	M0ORE	IO90er	83	52
2010-09-02 13:46	G3LDO	14.097156	-12	-3	IO90st	+37	5.012	WA8KNE	EM90gg	6846	4254
2010-09-02 13:46	G3LDO	14.097164	-18	-3	IO90st	+37	5.012	WO8LD	EM37jc	7081	4400
2010-09-02 13:46	G3LDO	14.097180	-21	-3	IO90st	+37	5.012	N6QW	CN88ob	7725	4800

FIGURE 1: Screen dump of G3LDO signal reports by *WSPR*.

PHOTO 2: The antenna arrangement at the QTH of G3LDO.

"I then dump them into an *Excel* spreadsheet and sort by frequency and distance. That way I can separate out the transmissions that were on each antenna and plot different graphs against the reporting stations, which will be at the same distance for individual spots (for directional antennas you can also sort by bearing if required)."

I felt that the G8JNJ method required modification for my tests. First of all, I rotated both antennas so that their maximum gain patterns were headed northwest. With *WSPR* running, I connected each antenna in turn to the radio for a period of 15 minutes over a total period of one and a half hours. Not having the know how to download the *WSPR* data into *Excel* I downloaded the data as an image file (partly shown in Figure 1) and scanned it into a *Word* file using a character recognition application. Once the data was in *Word* I deleted all data except transatlantic reports and unwanted column data.

The data was then sorted into time slots that coincided with the time the appropriate antenna was used. An example is shown in **Table 1**. The most important data is the SNR; the smaller the SNR negative number the stronger the signal (-10 is better than -15). Table 1 only shows part of the picture. Altogether there were 59 signal reports, 33 for the dipole and 26 for the quad. The average signal reports for the dipole were –22.33 while the reports for the quad gave –15.38. This gave the quad a gain of just under 7dB over the dipole.

There are feeder losses to consider. The quad was fed via 53m of RG213 while the dipole was fed with only 15m of RG213. With an SWR of 1.3:1 the feeder losses of the quad and dipole were 1.4dB and 0.4dB respectively. This gives the quad an 8dB advantage over the dipole using this antenna testing method, about what you might expect.

REFERENCES

[1] www.qsl.net/vk5bar; go to 'Papers' and select 'Small (loop) antennas'.

[2] *WSPR*, written by Joe Taylor, K1JT. Obtainable at www.physics.princeton.edu/pulsar/K1JT

Start Here

We take a look at receive antennas

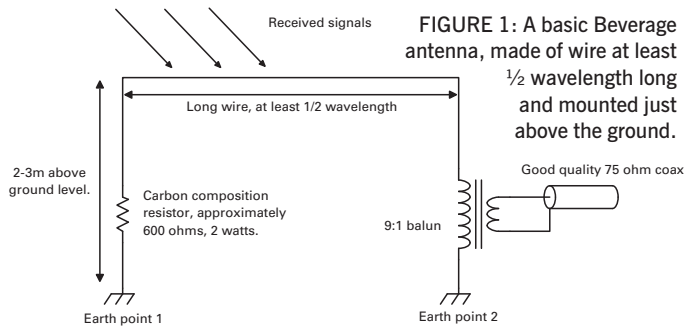

FIGURE 1: A basic Beverage antenna, made of wire at least ½ wavelength long and mounted just above the ground.

INTRODUCTION. Sometimes propagation can seem to be one way – either you can hear lots but work nothing or you're accused of being deaf! In this month's Start Here, we look at antennas for improving your receiving capabilities and how to use the antennas efficiently. While a detailed discussion of the antennas themselves is probably best left to a more specialised article, we hope to encourage you to experiment with your antennas and learn how it's still possible for amateurs to make a big difference to their station without breaking the bank.

WHAT IS A RECEIVE ANTENNA? The simplest description of a receive (Rx) antenna is one that has a good signal to noise ratio in general over a large segment of a band of your interest. In other words, the antenna is good at picking out the wanted signals even when there is an increase in the unwanted noise level (due to static, home electronics etc) on the band. Further, the antenna has this property across a large portion of the band you're interested in so there's no need to retune the antenna just because you moved 100kHz down the band. Unfortunately such antennas often do not have desirable characteristics like low SWR across the whole band, or they radiate RF very poorly. Thus we may use a form of switching system to alternate between our transmitting (Tx) and Rx antenna(s) for listening.

WHAT DO I GAIN FROM THIS? Depending on your choice of Rx antenna(s) you can gain in several ways. Some Rx antennas are fairly directional, such as the Beverage in **Figure 1**. By switching between several of these you can listen for better DX or attempt to manage QRM/N – if you've enough space. Other Rx antennas may receive signals arriving at different angles from your main antenna, thus by listening on the Rx antenna, signals may be stronger or you may be able to remove local interference that is arriving by groundwave.

COMMON RX ANTENNAS. Common Rx antennas include the Beverage and, more recently, Ewe [1] (see **Figure 2**). These are most often found on LF, 160m, 80m and, to some degree, on 40m. Often the main TX antenna is a form of vertical that radiates and receives (in theory!) in all compass directions at once. A Beverage or Ewe is then used on receive to selectively listen in certain predetermined directions such as North America/Japan/South America to improve reception of weak signals from those directions. The directions are predetermined by the direction that the antenna is physically built outside.

How you use your Rx antenna(s) depends on what type of radio you use. Some radios have dedicated Rx antenna sockets that you can select so that they automatically listen on them when in receive and switch to back to the main Tx antenna on transmit. If you don't have a radio with this feature, you'll need a manual antenna switch and have to turn it before transitioning from Rx to Tx and vice versa (*not* while transmitting!). There are some clever designs to interlock your radio to a set of Rx antennas to try and prevent you from damaging your equipment. It's best to try and figure out what type of system you're looking to implement and then see what designs are out there, experimenting to modify them to suit your own particular needs.

Caution: If you're manually switching, make sure that all operators of your station know which antenna to transmit into and also when it's safe to switch, ie not while still transmitting… It's also highly likely that your receive antenna will be physically located near to your transmit antenna. Therefore it will pick up a strong amount of your radiated RF (as well as other signals on the band). It's important not to let this get back into the station, particularly if you are using a second radio on receive. There are several designs out there that allow you to remove excessive voltages to ground before they reach your receiver and cause damage. Decide on your system and then read up on what protection works best for you.

CAN I USE RX ANTENNAS ON OTHER BANDS? Yes, there's nothing to stop you experimenting to find the right antenna to boost your received signals on the band of your choice. One common use of RX antennas is on 50MHz/144MHz where stations have a vertical or omni-directional antenna to listen (and perhaps transmit) on. This way, if there is a weak signal, you can switch to the directional antenna (often a Yagi on a rotator) so you can turn your main antenna or array more efficiently. Also, since propagation is somewhat less predictable, a quick change to a vertically polarised antenna may boost signal strength as the signals may have rotated while travelling.

COMMENTS. Experimenting is a key part of our hobby and it's often overlooked because of a belief that it requires too much time and effort for most amateurs. This is far from true. Nearly all amateurs experiment at some time, it's just debatable whether they realise they're actually experimenting! With this in mind, we would like to thank everyone who has written/e-mailed us feedback on Start Here; your comments are greatly appreciated and we look forward to hearing about some of your experiments.

Please note that our main contact address has now changed to jonathan.constable@uky.edu. Good luck with experimenting.

The Beverage antenna is named after the late Dr Harold Beverage, ex-W2BML. The Ewe antenna was invented by Floyd Koontz, WA2WVL and was first described in QST Volume 79, 1995. It is called the Ewe because it resembles an upside-down U.

WEBSEARCH

[1] Details of the Ewe antenna can be found in many places on the web including http://tinyurl.com/RC-1110-SH

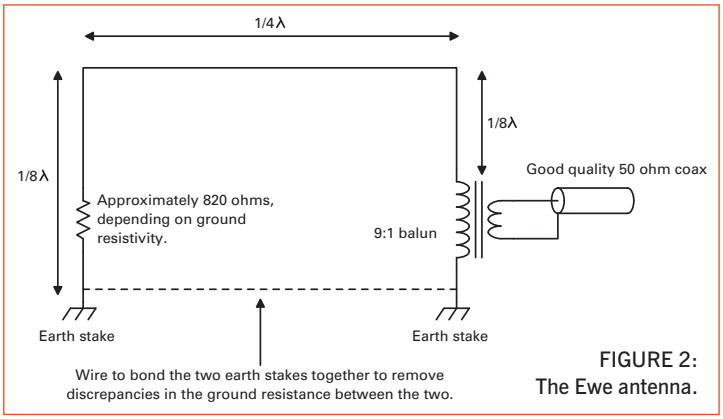

FIGURE 2: The Ewe antenna.

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etón Globe Traveler G3

An AM/FM/short wave radio with SSB and RDS

THAT TIME OF YEAR. I'm sorry but someone has to mention the word – Christmas. We are fast approaching the point where we start thinking about suitable presents for loved ones, or suggesting ideas of things we might like to receive. That's where this Members' offer comes in. The etón G3 is a compact radio that would be at home whether it's in the shed, kitchen window or taken away on holiday with you.

IN USE. If you are interested in a radio that gives you great domestic radio service when you are at home but can also give you a holiday radio where you can indulge in a little listening, perhaps on 20 or 40m, then you should read on. The G3 covers all the usual domestic broadcast segments but also is a general coverage short wave receiver from 150kHz to 30MHz (AM/CW/SSB) and a 118 to 137MHz airband receiver. If you are serious about your short wave or airband reception you may also want to consider the optional reel extension short wave antenna. This antenna is clipped to the telescopic one and then can be unwound and hung somewhere convenient to improve reception. You can, of course, connect your own antenna via the radio's external antenna socket.

So is it an instinctive radio to use or do you need to take the instruction book with you? FM broadcast, long wave and medium wave stations are quite easy to find. You can either punch in the frequency of your favourite station, tune around using the rotary control or use the auto tune up and down arrow. The display is easy to read and has a blue backlight, so you can keep track of the different functions. There's no need for repeated use of the instruction book! For amateur band listening, it's not that difficult either. Once you've decided where you want to start listening, the rotary tune control was the easiest method of tuning. Moving on to the air band and reception was certainly improved by the use of the reel extension antenna and the local airport was picked up quickly. It's not only for the airband that this antenna can make a difference. If you are trying to pick up weak signals, there's a definite advantage to the extra antenna length.

Additional 'goodies' that make this a great travel radio are things like alarms and a clock. These did require the instruction book, certainly for the first few times.

The sound from the radio was good, particularly on broadcast stations, which was a pleasant surprise. There's no shortage of memories either, so you could programme everything before you leave home, making holiday listening quicker and easier. A 3.5mm stereo headphone socket allows personal listening, and there's even a line in/out socket. If you choose to use NiMH AA cells to power the radio then the supplied 13A power supply can even charge the batteries within the set! Magic.

OFFER. So whether you are searching for that Christmas present or want to drop a few hints, check out the offer below for the Members' offer. You can never start shopping too soon!

2010 RSGB Elections

In this year's Board elections we have two candidates standing for one position. There are Regional Manager vacancies for five regions. Four regions have only one candidate, who are therefore elected unopposed. There will be an election for the fifth Regional Manager position, in Region 4, for which two candidates are standing.

All Corporate members are eligible to vote in the Board elections. Only Corporate members living in Region 4 are eligible to vote in the Regional election. Family Corporate Members are also entitled to vote and so will be sent a *RadCom* and voting envelope under separate cover.

In order to vote, read the biographies and personal statements of the candidates. You may cast your vote via the internet (www.votebyinternet.com/rsgb10) or by post. Cast your vote by ticking one of the two boxes in the Board election. Corporate members living in Region 4 may also place one tick against one of the two candidates for the Region 4 Manager post.

You may only use one voting option, via the internet or by post.

Board elections

THE FOLLOWING CANDIDATES ARE STANDING FOR ELECTION TO THE BOARD.

Phillip Brooks, G4NZQ

Candidate for election to RSGB Board

Date of Birth: 23 January 1945

CURRICULUM VITAE: First licensed in 1980 as G8XSQ then G4NZQ in 1982 and member of the Society since January 1978. Served as Deputy Regional Manager for Norfolk prior to becoming Region 12 Manager in 2005; and as Regional Council Board member since 2008 and Management Committee member since the same time. Instrumental in initiating the Regional Websites, rejuvenating the GB2CW service and introducing the Morse Competency Scheme. Have organised the GB2RS service in East Anglia continuously since 1994 and personally delivered 1,000 GB2RS broadcasts. Memberships include: Norfolk Amateur Radio Club, Essex CW Group, BATC and G-QRP Club.

PERSONAL STATEMENT: I have been a staunch supporter of the Society since 1978 and believe that its ability to liaise effectively with our Regulator and influence international bodies is vital for the success of our hobby.

During my time as Region 12 Manager it has been possible to develop wide and extensive contact with fellow amateurs of all interests and persuasions. This knowledge has enabled me to represent those diverse interests at Regional Council and Board meetings. I believe that dedication shown to different aspects of my recent involvement with the Society is proof of my future commitment to amateur radio.

Nominated by	Location	Known for (yrs)
Roger J Cooke, G3LDI	Norfolk	10
Rupert Thorogood, G3KKT	Somerset	4
Neil Whiteside, G4HUN	Cambridge	5
Murray Niman, G6JYB	Chelmsford	5+
Jim Stevenson, G0EJQ	Lincoln	8
Carlos Eavis, G0AKI	Bedfordshire	10
Leslie Butterfields, G0CIB	London	5
John Gould, G3WKL	Bucks	8 months
Brian Reay, G8OSN	Gillingham	5+
Angus Annan, MM1CCR	Stirling	5

Charlie Morrison, GI4FUE

Candidate for election to RSGB Board

Date of Birth: 28 November 1953

CURRICULUM VITAE: First licensed 1975 as GI8KZU, GI4FUE held since 1977 current Board member for Public Services, co-opted January 2010. Chairman of Greenisland Electronics Amateur Radio Society. Member of ARRL, IRTS, FISTS, UKSMG, CDXC, EUDXF and AGCW-DL as well as RSGB. Other callsigns held – OK8CM, ZC4CM & VK3FNT. Interests include HF DXing & contesting, VHF DX with emphasis on 6m & 4m, digital modes, software defined radio and computer applications in Amateur Radio. Currently employed as a Senior Service Engineer, servicing ATM's & self-checkout computer systems.

PERSONAL STATEMENT: Having been given the Public Service portfolio in January, I have spent the past year in repairing the fragile relationship between RSGB & the Network. I have submitted the Society's response to the government consultation on emergency preparedness, and am currently revisiting the MOU between the Society & the network. If elected I intend to continue my work with the MOU, eventually leading to a position of both organisations operating under an agreed document, for their mutual benefit, and that of their members. I am also intending to liaise with network regarding the 2012 Olympics, should our services be required.

Nominated by	Location	Known for (yrs)
Chris Danby, G0DWV	Norwich	4
Mervyn Black, GI4OYG	Co. Antrim	50
Kathleen Wilson, M1CNY	Sandbach	6
Dr W David Hutchinson, GI4FUM	Co. Antrim	30
Peter Lowrie, MI5JYK	Co. Antrim	15
Leslie Butterfields, G0CIB	London	5
Jim Stevenson, G0EJQ	Lincoln	5
Andrew Kissack, GD0TEP	Isle of Man	3
Colin Fallaize, MU0FAL	Guernsey	5
Donald Morrison, GM1BAN	Scotland	5

Regional elections

THE FOLLOWING CANDIDATES ARE STANDING FOR ELECTION AS REGIONAL MANGERS.

Leonard Paget, GM0ONX

Elected unopposed as Region 1 Regional Manager

Date of Birth: 5 September 1956

CURRICULUM VITAE: I was first licensed in 1982 as GM6JIC and after pressure from my fellow amateurs finally got round to sitting the Morse test 1991 and became GM0ONX.

I was co-opted as Regional Manager for Region 1 in April 2010 having served as a DRM for District 13 for about 5 years. I am also Chairman of the RSGB's Planning Advisory Committee and committee member of the Kilmarnock and Loudoun Amateur Radio Club.

My main Amateur Radio interests are homebrew construction, building antennas, HF and VHF operating and I am an occasional writer for RadCom and Practical Wireless.

PERSONAL STATEMENT: The RSGB has done good work particularly in respect of the protection and extension of our service, yet many members still feel that the RSGB is not listening to the concerns of its membership, particularly with regards to the incentive licence scheme.

Although as an Instructor I am a supporter of the concept of incentive licensing, as we approach its 10th anniversary I believe it its right we should review objectives of the scheme.

If I am elected I will do my best to convey the concerns and aspirations of Region 1 members at the Regional and National Council meetings.

Nominated by	Location	Known for (yrs)
Dennis Nutt, GM3YDN	Ayrshire	12
Angus Annan, MM1CCR	Stirling	6
Tom Wylie, GM4FDM	Renfrewshire	20+
Gordon Hunter, GM3ULP	North Lanarkshire	10
T E Callaghan, GM6WTH	Kilmarnock	28
Ian White, GM3SEK	Dumfries & Galloway	7

Denny Morrison, GM1BAN

Elected unopposed as Region 2 Regional Manager

Date of Birth: 16 March 1964

CIRRICULUM VITAE: Fully licensed in 1983. Held a variety of posts in Caithness Amateur Radio Society of which I am presently Treasurer. Was previously a DRM becoming RM in 2007.

PERSONAL STATEMENT: I have tried to bring a voice from the amateurs in the far reaches of the remoter regions of the amateur community to the RSGB which I hope to do so for another term.

Nominated by	Location	Known for (yrs)
James Moar, GM4EFR	Castletown	20
Al Lyons, MM0DRI	Canisbay	6
Donald Munro, GM3TCM	Caithness	20
John Crowden, GM1VGZ	Caithness	43
Brian Sparks, GM4JYB	Caithness	10

Dr David John Lockwood, G4CLI

Candidate for election as Region 4 Regional Manager

Date of Birth: 22 March 1956

CURRICULUM VITAE: Licensed forty years ago as G8FSO, then G4CLI on passing Morse test. Appointed to RSGB RMG in the 1980s. Ran a packet BBS for several years in the 1980's. Unfortunately suffered a near fatal brain haemorrhage in 1997 but now almost fully recovered. Have been secretary and head of training for the Wakefield & District ARS for last five years.

PERSONAL STATEMENT: If elected I intend to try to move Region 4 to the forefront of Amateur Radio in the United Kingdom continuing and expanding on the work of this past incumbent. I have my own car and phone and do not have a regular job so I am available for "duty" 24-7.

Nominated by	Location	Known for (yrs)
John Carter, G7JTH	Wakefield	7
David Owen Evans, G0EVA	Huddersfield	40
Ken Quinn, 2E0SSQ	Ossett	5
Darryl Burden, 2E0DJB	Wakefield	5
Jason Shettler, 2E0RNR	Huddersfield	3

Harold Scrivens, G0UGE

Candidate for election as Region 4 Regional Manager

Date of Birth: 1 July 1935

CURRICULUM VITAE: Elected Region Manager 4 2008. Chairm an Region Council 2009. Chairm an Region Council 2010. Served as Deputy Region Manager 44 from 2004-2008. Served as Lead Instructor, Shack manager, Chairman of a club. Member of Group of Earth Observation.

PERSONAL STATEMENT: Elected Regional Manager 4 in 2008 covering the North East gave me the opportunity to see clubs are crucial to the success of taking our hobby forward I am committed to supporting our volunteers.

They have become involved with communities/schools by teaching amateur licensing at all levels including computer skills and construction. This gave me the initiative to start the Region 4 Club of the Year Award designed to give organisations a way of showing themselves.

The RSGB has taken this nationally giving clubs/groups/ society the opportunity to win a prestigious award of National Club of the year.

Nominated by	Location	Known for (yrs)
Mario Brashill, G2DPA	East Yorkshire	8
Cliff Jobling, G4YHP	Grimsby	6
Geoff Darby, G7GJU	Durham	10+
G R Wilkinson-Kelly, G3ZRK	Co. Durham	10
Keith Johnson, G1PQW	Rotherham	8

Vaughan Ravenscroft, M0VRR

Elected unopposed as Region 5 Regional Manager

Date of Birth: 12 July 1972

CURRICULUM VITAE: I was licensed in February 2000 and a SWL since the age of 7. I have been an active member of Wythall Radio Club for 11 years and currently the Chairman. I have been the club's webmaster since 2002 and child protection officer since 2007. I became DRM for Region 5 in 2010. I am an active participant in the hobby of Amateur Radio and maintain excellent working relationships with individuals and groups involved with very different aspects of the hobby from radio scouting, satellite, radio astronomy and echo linked repeaters as I am also the repeater keeper for GB3IC.

PERSONAL STATEMENT: If elected as regional manager for Region 5, I promise to build on the good work of Trevor Bailey by supporting all RSGB members within the region. As regional manager I would strive for excellence in promoting and publicising both the RSGB and amateur radio as a whole I believe that as RSGB members we each have a voice and it's our combined voice that makes Amateur Radio such a fantastic hobby.

I thank you for your consideration when casting your vote.

Nominated by	Location	Known for (yrs)
Trevor Bailey, M0KMB	Staffordshire	3½
Chris Meadows, G6KMQ	West Midlands	12
Ian Ashford, G8PWE	West Midlands	10
W L Mahoney, G3TZM	Solihull	5
Raymond Wallbank, G0XAT	Staffs	14

Neil Whiteside, G4HUN

Elected unopposed as Region 12 Regional Manager

Date of Birth: 1 February 1960

CURRICULUM VITAE: I started as a SWL in 1974 and was first licensed in February 1977. I regularly compete in the 144MHz backpackers; make SOTA activations & take part in CAM-HAMS DXpeditions. I run the GB3PY Echolink Node. I am active on HF. I have been RSGB DRM for Cambridgeshire since spring 2007 and recently took on the additional role of DRM for Bedfordshire.

PERSONAL STATEMENT: Having worked with the outgoing Regional Manager for several years I aim to continue his excellent work in creating a cohesive & active Regional Team in the East.

I wish to promote contacts between the clubs in our area, as well as special interest groups, something that has already started in some parts of the region. Whilst we should be proud of our heritage & our past I will seek to align our hobby with some of the more modern & innovative aspects of modern life.

Nominated by	Location	Known for (yrs)
Phillip Brooks, G4NZQ	Norwich	4
Phillip Nice, G8IER	Ely	20+
Dave Burkin, M0VMC	Cottenham	8
Brian Shaw, G6HFS	Cambridge	8
Robert Warner, G1SAA	Cambridge	8
Martin Atherton, G3ZAY	Cambridge	5

Ballot Paper

RADIO SOCIETY OF GREAT BRITAIN

PLEASE READ THE CANDIDATE'S ELECTION STATEMENTS BEFORE CASTING YOUR VOTE

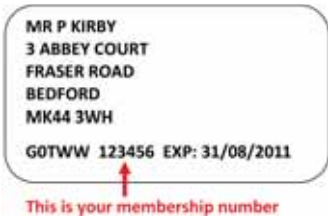
2010 Board & Regional Elections

RADIO SOCIETY OF GREAT BRITAIN

(A COMPANY LIMITED BY GUARANTEE, REGISTERED IN ENGLAND NO. 216431)

TO VOTE BY INTERNET

Go to:www.votebyinternet.com/rsgb10
You will be asked for your membership number without the leading zeros as Part 1 of your Security Code and the first four digits of your callsign as part 2 of your Security Code. Your membership number is on the mailing label that came with this issue of *RadCom*.



How to find your membership number on your *RadCom* mailing label.

TO VOTE BY POST

Vote by marking a cross 'X' in the box next to your chosen candidate(s).

CANDIDATES ARE LISTED IN ALPHABETICAL ORDER.

CORPORATE MEMBERS MAY VOTE FOR ONE OF THE FOLLOWING BOARD CANDIDATES

Candidate Name	*For*
Phillip Brooks, G4NZQ	☐
Charlie Morrison, GI4FUE	☐

CORPORATE MEMBERS LIVING IN REGION 4 MAY VOTE FOR ONE OF THE FOLLOWING TWO CANDIDATES

Candidate Name	*For*
Dr David John Lockwood, G4CLI	☐
Harold Scrivens, G0UGE	☐

RETURN INSTRUCTIONS

Voting closes: 12 noon on Thursday 2 December 2010.

The internet service is available 24 hours a day. You will be asked for your callsign and membership number without the leading zeros. Your membership number can be found on the printed address label on your copy of *RadCom*.

Postal votes should be returned to the Independent Scrutineer, Electoral Reform Services, The Election Centre, 33 Clarendon Road, London N8 0NW in the pre-paid envelope provided.

You may only use ONE voting option. Any attempt to vote more than once will be detected.

Back of Ballot Paper

IF VOTING BY POST, PLEASE ENCLOSE YOUR BALLOT PAPER
WITHIN OFFICIAL ENVELOPE SUPPLIED WITH THIS ISSUE OF *RADCOM*.

International Lighthouses and Lightships on the Air - from Orkney

The main operators, from left: Ed, GM0WED, David, MM5DWW, Glenn, 2M0DES, Colin, GM0IFM.

WEATHERING THE STORM. An Orkney equinoctial gale came early this year – one month early to the day – much to the consternation of members of Orkney Amateur Radio Club. Three members of the club, David, MM5DWW, Colin, GM0IFM and Glenn, 2M0DES, set off on the mid-morning ferry to Westray, courtesy of sponsorship for the main operating van and caravan from Orkney Ferries Ltd. I set off on the last ferry of the day to join the others, after attending the funeral of Anne, GM0TLX, XYL of the stalwart of amateur radio in Orkney, Bill, GM3IBU.

Alighting from the ferry and after the 10 mile drive I arrived at the farm of Noup, where the road deteriorates into a track. This track, abandoned by the Northern Lighthouse Board 42 years ago, has been subject to the ravages of the Orkney weather, not inconsiderable use and is a slow hard-on-the-car journey. After a mile and a bit, the tip of the lighthouse came into view. What would soon become apparent was that the wind was rising with every wheel turn. Then the vague shape of three dark figures huddled at the base of one of the Hustler vertical antennas materialised. I was greeted by the usual abuse of three unhappy colleagues who had been rained on all morning while setting up the vertical antennas – I had the antenna analyser in my car.

Though the worst of the rain had passed, the wind was 40mph and rising. Colin's tent was already pitched in the lee of the lighthouse compound wall and the one I was to use was quickly erected beside it. The mess tent began to flap alarmingly; though we thought it was well sheltered behind the lighthouse buildings, and concern rose with the wind. It was soon taken down, covered with a groundsheet and lashed firmly to the ground. We abandoned the idea of using dipoles, as getting a mast up would have been too risky. With just the two verticals in place, we decided to begin and repaired to the caravan and David's van. The two 'shacks' began operation.

ON THE AIR. The first contact was to the USA, N2EV, SSB at 1913 (all times BST) on 20m and the first CW was DF2QU on 30m at 1915. As operation continued into the night, the wind increased to above 70mph. It was at about 2100 that I found myself alone operating CW in the caravan with gusts now clearly above 90mph. Sending CW was no mean feat with the violent movement of the caravan up and down and from side to side; then, the thought struck that this was a silly thing to be doing and a very dangerous place to be – which is perhaps why I was alone in the caravan. If the caravan let go from its lashings, it was only a short distance downwind to the steep descent and cliff drop into the sea – and oblivion. It was, I think, the most frightened I had ever been and seeing my wife and daughters again became very important.

Colin and Glenn somehow returned to the caravan and helped weigh it down, but closing the door was now a problem from inside the caravan. None of us had the strength to close it against the wind, neither did we for the next 24 hours. In effect, someone had to be outside and someone else inside to close it.

The last contacts that night were CW, at 2124, PC10WSF on 30m from the caravan, and SSB at 2227, DK2RZ/M on 40m from David's van, parked more sensibly further away from the sea.

Time to retire to the tents – a bad idea. I did somehow drift asleep until awakened by a firm smack across the face from the side of the tent. I didn't know tent poles could bend that far – I was to discover later that they don't. At 0215, sense and terror prevailed and all my effects were transferred to my vehicle, which I had already kitted out for sleeping. After 40 years of experience of Orkney, the car was wisely parked nose to wind, so it was in through the rear hatch. The land of nod came through the noise until 0500, when a blast of cold air hit me as Colin urged me to come and save the remnants of the tents. The poles had snapped and the material torn. He had abandoned his tent for the caravan sometime in the night, but he got not a wink of sleep from the buffeting it was receiving and the roar of the wind. David, in his van, was also suffering from the wind and an increasingly evident cold into the bargain.

BACK ON THE AIR. We were up, so back to operation, the first contact was GB2SLH at Sumburgh in Shetland, at 0502 SSB 40m, with OM8CM CW on 30m at 0535. With the wind having moderated to 60mph, the general feeling was that there would obviously be no ferry to bring out Dave, GM0TKH, who was to join us until Sunday evening, and Brian, MM3LLU and Stevie, MM0SJH out for the day.

Taking a break, Colin and I headed down the track to try to get some mobile phone reception so I could see how things were faring at the home QTH. A mile down the track, after remarking how the wind was dropping, we met two cars wending their way slowly towards us, the occupants asking "What wind?" OK, Brian and Stevie are both

Keith Herdman from Gorebridge, Midlothian and Evelyn Budge visit the shack during a lull in the weather. Glenn, 2M0DES is on the microphone.

Glenn, 2M0DES, closing the caravan door on Saturday.

The cliffs at Noup, on Sunday morning.

The 40/20m dipole, next stop due west, the north Labrador coast.

Orcadians and such a remark is to be expected, but even they were approaching a rude awakening as they climbed up the hill. The wind stayed around the 60mph for most of Saturday. No dipoles that day, though the Hustlers withstood everything the wind threw at them.

Dave too had joined the group and, from the buffeting the van was receiving with no horizon to fix on, found himself feeling slightly seasick on dry land. Stevie and Brian took over SSB operation and the mobile set-up in my car got Colin and me in the GB1OL log on 20m SSB, working Stevie on 14.273.20 from 1 mile.

A steady stream of contacts was made and some more intrepid visitors made it to the cliffs and visited the station. Closing at 2115, we made 935 contacts that day.

During short breaks in the cloud around midnight on both Saturday and Sunday nights I sat in the car and gazed on the impressive sight of the Northern Lights.

ALL WAS CALM. Sunday dawned and, stepping from the car, I promptly fell over – no wind, well, not quite, only about 15mph, the Orkney equivalent of flat calm. I was up the earliest for once but not having been briefed on how to start the generator, decided to operate from the FT-857D at 50W in the car, with the Maldol roof-mounted 40/15m vertical and a dash-mounted Palm mini paddle. Thanks to DJ6ZM, OK1HAS and GW3SB, who heard the feeble RF from the 1.2m-long antenna on 40m. The RF must have set off the other operators' internal alarms and they soon materialised from their slumbers and we were back on air with gusto by 0723 to ES0OU on 40m PSK.

At about 0800 we decided to put up the main dipole and, as it went up, down came the cloud and heavy drizzle. At last, three stations. The loudspeaker wire dipole for 20 and 40m worked well and though only about 16m above the ground, it was still only a few metres from the 70m cliffs – the next place west is the northern part of Labrador! (Orkney really is that far north and there is still Shetland with its five intrepid Lighthouse Weekend XYL operators to go). Radiating SE/NW enabled many more contacts, but the conditions on 40m deteriorated as the day progressed with heavy QRN and QRM coming up above S7, we guessed with no little contribution from the lighthouse. We had had a similar experience on a trip to North Ronaldsay Lighthouse last year. Our advice to others is to erect your antennas as far away from a lighthouse and its electronics as possible. So we swung the dipole to face E/W, end on to the lighthouse. This gave us a marginal improvement.

Another stream of visitors came on Sunday, including an Italian couple. Did anyone notice the ten minutes with no Italians? That must be a first! That was the time we wanted to show them a fellow countrymen on air, so you can thank us and our visitors for that. Otherwise the day passed without notable difficulty.

Monday came and the decision was that the verticals needed to come down, while operation from the dipole could continue till lunchtime. A group of three young visitors came and enquired what we were doing. Unfortunately the main data and SSB stations were by now off air, but they were shown the mysteries of CW by Colin, before I went on SSB. "How did they fancy a go?" I asked. They were game for it, so changing the call to my home call, when Ken, GI4ERM answered, onto the microphone went Paul and Geira for a short exchange. Unfortunately, his conditions were heavily affected by QRM, so when at 1232 GB2EVR, with Mike on the mic came on at S9+20, it was too good a chance to miss, so back to GM0WED/P and again Paul (from Edinburgh), and Geira (from Orkney's county-town of Kirkwall) took to the mic. Our thanks go to both these operators for their time and cooperation and two visitors certainly saw the fun and attraction of amateur radio.

DXPEDITION OVER. Operation stopped at 1135, the last contact being on 40m SSB. We left with memories of a mixture of horrendous conditions, great camaraderie, 1,949 contacts, a variety of visitors, the Northern Lights and, all things considered, a successful and varied weekend.

STATISTICS. *CW/SSB station:* FT-1000MP Mk V, 200W, Microham MkII, Hustler 5-band (single 3-way guyed) with 36 radials, until the 20/40 dipole at 16m came on stream. N1MM logging. *Data/SSB station:* IC-7000, Hustler 9-band vertical with 60 radials, single 3-way guyed. Acom 1000 amplifier at 300W. Logger 32. *SSB/data station:* Icom IC-746, Hustler 5-band vertical, 52 x 11m radials. Single 4-way guyed. SSB 100W, PSK 35W. Digimaster mini pro from G4ZLP. *Logger 32. Contacts:* 73 DXCC on mixed mode, 57 DXCC on SSB, 53 DXCC on CW, 43 DXCC on data, 802 QSOs CW, 849 QSOs SSB and 298 QSOs data.

THANKS. Grateful thanks to Orkney Ferries, which sponsored the return cost of the main van and caravan (the two shacks); to Donny, GM0HTH for the loan of the caravan to the club (which he does frequently) and, in particular, to the Seatter family of Noup Farm, for permission to use their land at Noup for the operation. It was greatly appreciated, as was my own, non-rocking bed that night when I got home.

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Martin Lynch supplies Peter Hart with his new FT-dx5000 at the store in August" Peter Hart (left), Martin Lynch (centre), Dean Croome, Yaesu UK General Manager (right).

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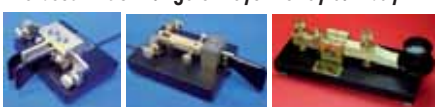

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Mark, G8AWO showing off the assembled 10/15/20 & 40/80m Combo Isotron's before mounting on the roof at ML&S HQ.

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Duplexers/Triplexers

MX-72N	1.6-150/400-460MHz Duplexer	£45.94
MX-62M	1.6-56/140-470MHz Duplexer	£69.44
MX-610	HF/6+2+70 (for FT-8900)	£73.52
MX-2000	6/2/70 Triplexer	£85.78
MX-3000N	2/70/23 Triplexer	

Switches

CX-210A	2-way, SO-239 Die Cast	£47.98
CX-210N	2-way, N-Type, Die Cast	£74.54
CX-310A	3-way, SO-239, Die Cast	£83.74
CX-310N	3-way, N-Type, Die Cast	£109.28

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Slinky loop aerial

Believe it or not, a wide range aerial made from a child's toy

PHOTO 1: The completed Slinky loop antenna, mounted on a tripod.

INTRODUCTION. If I told you I made an antenna 650mm in diameter that can transmit 80 to 17m with 100 watts and a SWR of less than 1.2:1, you would tell me that I am smoking my socks. Well, let me tell you the story.

We, that is my XYL and I, retired in South Africa where antennas are generally big, then relocated to my son's place in Lindfield, West Sussex. We have now moved in to a retirement flat in Haywards Heath, with no ground and no antennas allowed – and a noise level of S9+20. I was ready to take up tiddlywinks.

I asked around at the club and was given a loop design that jogged my memory. In the November 2003 *Practical Wireless* John Heys, G3BDQ, wrote about a Slinky Hula antenna he made with a Slinky, a hula hoop and a 120pF capacitor. So, using his design and a bit of my mechanical skills I have made my own version. It comprises 32 turns of an original Slinky, 2042 mm of 1/2" plastic water pipe, a plywood base, strong string and, most importantly, one 500pF variable capacitor.

Now, I just happened to have a Jennings vacuum capacitor, obtained from a boot sale in South Africa. This is the Rolls of capacitors, not for the faint hearted when buying a new one. I am also told that even if it has lost its vacuum you can still transmit up to 100W. If you are going to experiment with standard variable caps I would suggest a slow-motion drive. I found a 120pF did not tune down as low or as high as the 500pF cap and was very sensitive to the touch.

CONSTRUCTION. I started off with the pipe, marked the centre, 29mm either side of the centre and then at 58mm intervals 15 times either side of the centre. I then drilled 5mm holes right through the pipe (in a straight line).

The Slinky is available from several sources. Mine came from Maplin in Brighton. Count 32 rings of the Slinky and cut it with a strong pair of wire snips. Screw one side of the pipe to a suitable or plastic base, making sure it is in the same plane as the rest of the holes. Thread the Slinky over the pipe, bend the pipe round and then screw the other side of the pipe to the base.

Start with tying one full ring of the Slinky to the pipe and then one on each hole, ending with a full ring again. **Figure 1** and **Photo 2** show the basic arrangement.

I made up a bracket to hold the input socket and vacuum capacitor (see **Photo 3**). It doesn't need to be anything special, but there must be a good connection between the body of the input socket and the earthy side of the capacitor.

SETTING UP. It's important to find the right tapping point for best VSWR. To start with, connect the centre pin of the input socket about a quarter of the way round the loop. Tune the loop to resonance (listen on your receiver and adjust for maximum noise). Then transmit at low power, measuring the SWR. You will probably have to move the tapping point several times and maybe re-tune the capacitor because the settings can interact. However, once you've got a good match, you shouldn't have to change the tap for different bands.

I used my MFJ analyser and found I could get a 1.2:1 SWR anywhere between 80m and 17m.

IN USE. Initial tests on 5MHz by Ken, G3WYN got very good results. The loop was only a couple of S-points down on his full sized dipole, which surprised us.

As we have just moved into the flat I have not been able to experiment much further. But I am going to continue playing because it would be nice to be able to tune it remotely. I would like some one to design (cheaply!) a stop for each end of the vacuum capacitor drive if I use a stepper motor.

Have a go at building this antenna. I would like to know how you guys get on, maybe we all can benefit from your experiments too.

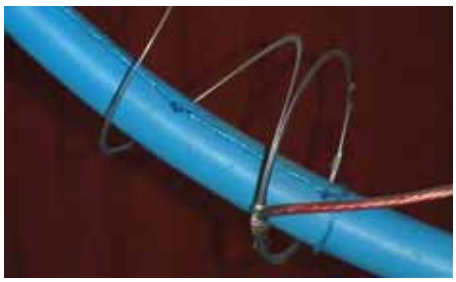

PHOTO 2: Detail of how the Slinky is mounted on the water pipe. The string is tied to the Slinky on the hidden side of the pipe.

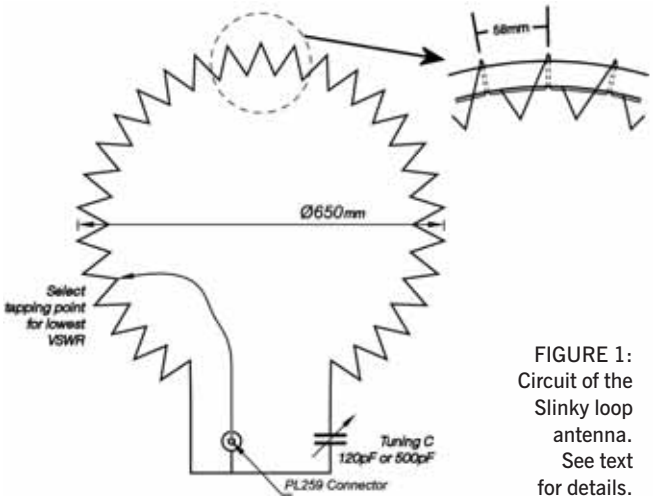

FIGURE 1: Circuit of the Slinky loop antenna. See text for details.

PHOTO 3: General view of the business end of the loop, showing the mounting block, capacitor/input socket bracket, wiring and my tapping point.

HF

Plenty of DXpeditions and rare callsigns appearing on the air in the next few weeks

The Voodoo Contest Group will operate in the CQWW contest as 9L5VT to remember Vince K5VT (see text). In this team photo, taken in Guinea in 2008, Vince is on the right of the front row.

LOOKING UP. HF propagation finally started to look up during September and there were some interesting reports of, for example, Hawaii via long-path on 12 and 15 metres. ZS8M started to be more active from Marion Island and made his way into a number of UK logs. All of which augured well for the October expeditions I mentioned last time. As far as the Netherlands Antilles are concerned, as I write this the ARRL have confirmed that the existing entities would be deleted as of 4am local time on 10 October, but news is still awaited of just which, and how many, entities will replace them. But, as the old adage has it, WFWL (work first, worry later). Whatever the outcome, DXCC credits will not be available until 2011, so there is no panic to get the QSLs or LoTW confirmations. As for Jarvis Island, just to add some further information to what I intimated last month, this expedition has indeed been postponed and has been rescheduled for November of 2011.

DX NEWS. The OM0C Contest Crew will be in The Gambia from 17 to 30 November, signing C50C and C52C, used last from The Gambia in 2007. Special callsign C5A will be reserved for the CQWW CW Contest. The group will be equipped with gear from Elecraft and Kenwood with six full-time stations during the CQWW and four stations at other times. Amplifiers will be the OM3500A, OM3500HF and OM2500HF. Antennas will be verticals, delta loops, four squares, Spiderbeams and Yagi stacks.

Christian, TL0A, is back in the Central African Republic (CAR) until the end of 2011. He is active mostly on SSB and RTTY, but will do CW on request. QSL card requests go to his callbook address in France. He is very good about answering all requests; it just takes a while as he picks up his mail when he goes home to France.

John, ZS1LF (ZR1JON), who I mentioned last month, is now on Gough Island along with a team of scientists. By now he should have commenced his ZD9GI activity. John and QSL manager Johan, ZS1A, ran some tests with good signals on 40 and 20. "The antennas tested very well from 80m to 10m but he will have to make another for 160m", says Johan. Quite separately, Dieter, DJ2EH, will be visiting Tristan da Cunha between 20 November and 8 December, assuming the ship runs to schedule (I believe, during that time, the ship goes to Gough Island where ZD9GI is located, to resupply). If the weather is not too bad, he says, he will put up a 73ft vertical to cover 160, 80, 40 and 30, and a three-element wire beam. His rig will be a K3 to an 800W amplifier. Dieter plans to operate on CW, SSB and RTTY.

Sigi, DL7DF, will lead operations from two African countries, starting later this month. First is 9X0SP, Rwanda, 26 October to 2 November. Second is 9U0A, Burundi, 2 to 11 November. Operators are DL2WK, DL7DF, DL7VEE and DL7UFR. They will have three Elecraft K2 stations with amplifiers (700-900W) into verticals on the low bands, a Spiderbeam, HF9V and 2 element vertically phased beam for 40 and 30. One station will be full time on digital modes. QSL to DL7DF direct or to the German DARC Bureau. Sigi is also heading back to Vietnam later this year. This time he's going alone to Phu Quoc Island (AS-128) from 26 November to 6 December. He will be operating as XV4SP using a K2 and 700 watt linear into an HF9V and low band inverted dipole on 80 and 160 meters. Activity will be on CW, SSB, RTTY, PSK and SSTV. QSL via DL7DF.

A five man team from Finland has announced plans to activate Madagascar with an emphasis on the low bands, to be 'conducted in cooperation with Ake, 5R8FU'. The team includes OH2BH, OH2PM, OH6KN, OH7EA and OH8NC. Listen for 5R8X to be on all bands from 26 October to 10 November. Low band experts OH2PM and OH6KN will focus their efforts on 160 and 80 'to satisfy global demand'. They will be installing vertical antennas for the low bands in a large field.

Dave, KH2/N2NL reports the following useful breakdown of Chinese licence classes and privileges:

5th class:	SWL only
4th class:	BG, BH, BI, 15W PEP above 29.2MHz
3rd class:	BH, BH, BI, 25W PEP but not 30, 20, 17 or 12m
2nd class:	BD, 100W PEP on all bands
1st class:	BA, 1kW PEP all bands

IK1PMR, K2LEO/PA3LEO, LA9SN, K6SRZ, N6TQS and YU3AA are heading for Niue, ZK2, and Norfolk Island, VK9N, with a focus on Europe and the LF bands. They will be on Niue 20 November to 3 December, including the CQWW CW Contest. The callsign ZK2A has been confirmed by email exchanges. They will be staying in the 'Namukulu cottages'. For Norfolk Island, they will be there 5 to 19 December, staying at the Pacific Palms. They have requested the callsign VK9NN but do not have it confirmed yet. See the website for further details.

HA5UK and HA5AO will be on Efata Island, OC-035, Vanuatu, from 1 to 15 November, signing YJ0HA, all bands and modes, including SSTV. QSL via HA5UK direct and LoTW.

Nikola, FJ/VE3EY, will be on again from St. Barthelemy from 22 to 30 November, all bands, CW, SSB and RTTY, and then in the CQWW contest. QSL via VE3EY.

Gerd, DL7VOG, is heading back to two Colombian Islands in the Caribbean starting in mid-November. He plans to start as HK0GU/1 from the IOTA group SA-040, possibly Isla Pavitos, however 'this is not confirmed yet'. This will be from 17 to 21 November. Note that for DXCC purposes this counts as mainland Colombia. Next stop will be to San Andres Island (NA-033) as HK0GU. This is a separate DXCC Entity from Colombia. The dates for this one will be 21 November to 2 or 3 December.

He prefers CW and RTTY and plans to participate in the CQ World Wide CW DX Contest. QSL via DL7VOG either via the DARC QSL bureau or direct.

A very early warning, but Chris, VK3FY and Steve, VK6IR (co-leader) are in what are described as the 'preliminary, but serious' planning stages to put Heard Island back on air in February 2013. It is proposed to have a 13-member DXpedition team on the island for two weeks. This one is getting close to the top of the Wanted Lists once again, the last expedition having been VK0IR in January 1997.

Now the big one for the month (as if the foregoing were not enough). A 13-man team (Germans plus one Pole) head for Kermadec, signing ZL8X from 19 November to 5 December. This should, in many ways, be relatively easy from the UK, being almost at our antipode. The problem is not propagation but the sheer rarity. It is tough to get permission to land on, and especially to stay on, the island. I would imagine, though, that there should be openings on most bands between ZL8X and the UK, especially around our dawn and dusk. The pile-ups will no doubt be fierce in the early days, but it should get easier towards the end of the operation. For myself, I need it on 6 bands and one mode (SSB - the last one I need on phone), so this is one I am certainly looking forward to.

Finally, don't forget the CQWW CW Contest, last full weekend of November. For example, the Voodoo Contest Group will be back in Sierra Leone (this year signing 9L5VT in memory of Vince K5VT, a long-time member of the group). There will be many other contest expeditions and although the pace during the contest itself can be frantic if you are not an experienced CW operator, many of these teams will be active before and/or after the contest itself. Look on the NG3K website for details (see last month).

60m REPORT (from G4TRA). As the autumn nights draw in, QRN levels drop and clocks go back, 60m long haul should be improving. For the first time Turkey has been activated on the band with TA4ED working at least one UK station, however Antilla's signal has not been strong here in the UK. A second Kuwait station, 9K2MU, has been heard working into the UK and there have been plenty of USA contacts made too this month. Now a couple of up and coming activations: Robert, K5PI/ZF2PI reports that he could be active as early as 18 November from Little Cayman, but it's more likely that he'll be on from 23 to 26 November from Grand Cayman as ZF2PI before being active in the CQWW contest. John, W5JON will again be operating as V47JA, from the Calypso Bay, St Kitts, 20 October to 10 November. Finally, where and when might I hear this DX? Well keep your earphones glued to 5.3715 and 5.4035MHz from about 11pm local and keep an eye on www.dxwatch.com/dxsd1.php?f=5 for reported sightings. Good DX.

WSPR (Weak Signal Propagation Reporting). I have mentioned WSPR before but was reminded of its value when we had a talk on the subject recently at my local (Reading) club. Indeed, the speakers set up a working demo, running 2W on 30m into a poor doublet, which resulted in us being 'heard' during the course of the evening from VK/ZL in the East to most of the USA to the West. While much higher ERP is generally required to conduct a CW or SSB QSO, WSPR shows that paths often exist when we wouldn't perhaps expect them to. With more and more stations participating on WSPR (the website shows several hundred a day during September), the tool is getting increasingly useful, though there are obviously still large swathes of the planet with no, or very few, reporting stations, particularly in Africa, Asia and much of South America. All that is required to put on your own WSPR beacon is a low power transmitter, PC with the WSPR software, some sort of interface unit and an antenna (preferably omnidirectional).

CORRESPONDENCE AND TABLES. Peter, G3HQT says, "Thank you for bringing to our attention the Reverse Beacon network, which I didn't know existed. Quite fascinating to see where I was being received on what sounded like a dead band. It raises the question 'why wasn't I hearing any stations from those areas when I was calling CQ?' I don't often call CQ but it made my day when a ZL came back to me one morning on 30m". Peter's log for this month shows RI1FJ, H74LEON, 9M2CNC and VK7GK on 30 CW, TL0A on 30 RTTY, YV4OW on 30 PSK31, JY5HX on 20 CW and JT5DX on 17 CW. Dave G3TBK reports YJ0VK on 20 & 17 CW, plus KH0/KT3Q on 30 & 15 CW. He also says, "In the last few days it has been good to make contacts on 12m again, SU, A61 & 9M2 being the pick. Total DXCC score so far this year is 227, so conditions haven't been bad all the time!"

Simon, M0VKY managed a couple of new all-time ones, to whit 3B9/IZ4AKS on 15 & 20 and, star of the show, ZS8M on 15. Simon says, "I didn't want to report it until I was in the online log and double checked. The QSL card then had smoke on it heading out of the shack door!" I'm sure we have all been in that situation, where you just want to be sure you are in the DX station's log OK. In days gone by it often meant a wait of months until the QSL arrived, or your own came back marked "Not in log". Nowadays it is usually less fraught, with many expeditions uploading logs as they go along, so that if your QSO is no good, there is often time to try again. Anyway, Simon's other recent loggings include 3B8/IZ4AKS, KH2/N2NL, P29CS on 15, WH2X on 17, 9M6DXX/P on 15 and 20, plus VK2ABN, ZL3JAS/M , ZL4PN, YV5ZZT and ZL3OZ on 40. All contacts were on SSB.

Terry, G1UGH mentions PY2MAJ, PU2UTC and PU5VOZ on 10, LU4VL on 12, Z21BB (new country), 8P5A, 9Z4CT, YB0MWM, CE4CT, CE1TT and OX6YL on 15 plus 6V7W, 5Z4/IZ2DPX/P, JO7CVU, V85TX, 8N5A, 9M2TO HK1T, JT1BV (another new country for him) and A41OF on 20, all SSB. Martin, M0XJP has once again been operating from Spain where, this time, 17 and 20 proved to be the most fruitful bands. The latter produced contacts with 9M2GET, UN7QFT and ZS6TQ, plus South America, Europe (including G4AKC/M bicycle mobile in Blackpool) and daily skeds back to his local club in Stevenage. Best on 17 was VP8LP in the Falklands.

I have yet to decide what form the Annual tables should take during 2011. This year's format has not been as popular as the previous all-band totals, but I do like to ring the changes. Maybe a WARC bands table? I would welcome your views. As for the 9-band tables, you will find the latest ones in the new *RSGB Yearbook*, which has now been available for a couple of months.

2010 ANNUAL TABLE
(starting 1/1/10, sorted this month by 80m totals)

Call	10m	12m	80m	160m
G4ATA	0	0	105	0
G3TBK	82	85	95	100
MD0CCE	13	94	85	101
G3HQT	52	47	81	0
MU0FAL	49	72	65	51
GW4BLE	89	30	58	57
G3SED	27	85	46	68
M0VKY	42	0	45	38
G6CSY	12	2	44	21
G4XEX	10	17	30	1
G4FVK	13	1	29	0
MM0DXH (SSB)	14	0	26	14
MW0DNF(QRP)	5	7	10	0
GW0RYT	40	24	6	0
MW0MAU	7	12	6	0
GW1PJP	49	46	4	0
G1UGH	40	27	0	0
GW0LKJ	0	9	0	0

SILENT KEYS. Manfred Reichert, DF1IK passed away on 22 September of a heart attack. He was 60 years old and was very active from Saudi Arabia, as an operator at the HZ1AB club station and then (December 2004 - May 2008) under his personal callsign HZ1IK.

THANKS. Special thanks go to the authors of the following for information extracted: OPDX Bulletin (KB8NW), The Daily DX (W3UR) and 425 DX News (I1JQJ). Please send items for the **January** issue by **Friday 19 November**.

WEBSEARCH
9X and 9U: www.dl7df.com/9x_9u/index.html
OM0C Gambia expedition:
www.om0c.com/?Gambia_2010_-_C5A
WSPR: http://wsprnet.org
ZK2 and VK9: http://ik1pmr.com/pacific-2010

VHF/UHF

Exciting tropospheric propagation to stations in the Azores on the 144MHz band

PHOTO 1: The antennas at the QTH of Fred Fournier, CU8AO.

PROPAGATION SYNOPSIS. September was a disappointing month for ionospheric propagation with only one late season Sporadic-E (Es) opening being reported on the 50MHz band. On the other hand, it was tropospheric propagation that provided the excitement on the 144MHz band with some extraordinary contacts being made with stations situated in the Azores. For the fourth month running a few lucky stations situated in Cornwall could also make tropo contacts into the Canary Islands almost 3000km distant. However, for most operators interested in making long distance contacts on the VHF bands, it was meteor scatter that provided the mainstay of DX contacts.

METEOR SCATTER. The general principle of scattering VHF signals off meteor trails is easy to understand. The transmitting station is located at a large distance, about 500-2000km away from a receiving station. Because of this distance, direct radio contact is generally impossible due to the curvature of the earth. When a suitably oriented meteor enters the atmosphere its trail may reflect the radio waves from the transmitter to the receiver. At the receiver, where the signal of the transmitter is not normally received, the transmissions can be received for a short period as long as the meteor trail is present. Such reflections, called bursts, last from a fraction of a second to several minutes. That is the general principle of meteor scatter, often called MS propagation. The term 'meteor scatter' can be misleading though. Remember that it is not the meteors themselves that scatter signals beyond the horizon but the ionised trails that are left behind as these fragments burn up. You can liken it to a mini E-layer with ionisation occurring between 80 and 100km high, corresponding to a maximum range of around 2100 to 2300km. From the UK this means that contacts can be made on the VHF bands with stations located as far apart as Iceland (TF) in the north-west to Morocco (CN) in the south and as far east as the Baltic states and Russia. Nowadays, most MS tests are carried out on the 50MHz and 70MHz bands using JT6M or the very new ISCAT digital mode and on the 144MHz band using FSK441.

The Perseids meteor shower that peaked on 12 August brought with it an increase in MS activity on the 50MHz, 70MHz and 144MHz bands with contacts being reported well beyond 2000km in some cases. I concentrated my MS activity on the 70MHz band, running a Kenwood TS-690S transceiver driving into an RN Electronics transverter, a TE System 150W solid-state amplifier and two 7-element DK7ZB Yagis. My contacts, a mixture of FSK441, JT6M and SSB, made between 11-13 August, included the stations of DL3YEE, DL6BF, DC8TS, DH8WE, EA1YV, GM3NKG, GM3WIL, GM4VVX, GM6VXB, I3VWK, LA5ZK, OK1MAC, ON5VW, OZ1JXY and 9A/S51DI/P.

Reg Woolley, G8VHI (Warwickshire, IO92) mentions that he is using a Kenwood TS-2000X transceiver, a 300W solid-state amplifier and two stacked 9-element DK7ZB Yagis. During the Perseids shower he made FSK441 contacts on the 144MHz band with the stations of DF2RL (Germany), DJ8MS, E76C (Bosnia-Herzegovina), F/SW1NZX (France), HA4XG (Hungary), IK0SMG (Italy), LA/DL1RNW (Norway), LZ9X (Bulgaria) for best DX at 2319km, OH6KTL (Finland), OK2PWY (Czech Republic), RA1TBH (Russia) at 2153km, RA1WU, S51AT (Slovenia), S51KK, SM2A (Sweden), SM2CEW, UW8SM (Ukraine), YO2MCK (Romania), YU1IO (Serbia) and 9A3JH/P (Croatia).

Bob Harrison, G8HGN (Essex, JO01) spent some of his time during the peak of the shower listening on 144.200MHz for SSB stations. However the predicted peak in activity at 2340UTC didn't materialise although he did hear the station of I8MPO (Italy) for nearly 2 minutes around 0045UTC. Random activity seemed higher than previous years and although no really big bursts were heard Bob did copy the SSB stations of E73LM, IK1MTZ, IZ7FLS, RA1A, S50C, SM1A and 9A4WY.

Darrell Moody, G0HVQ (Gloucestershire, IO81) reckoned that the Perseids seemed a pretty good shower this year and that he made contacts on five days around the peak period that occurred on 12-13 August. He had great success compared to previous years with 10 new locator squares being worked, taking his all-time total on 144MHz up to 149. Running only 70W to a 9-element Vargarda Yagi he made FSK441 contacts with the stations of EB5AL, F1HQM, F5ODA, F6BEG, F6DRO, GM0HTT, IZ0FWE, IK1MTZ, IW2HAJ, I3YXQ, IV3NDC, LA0BY, OK1MDK, OK1UGA and SP6NXG.

Ray James, GM4CXM (Lanarkshire IO75) reports that he made some good MS contacts throughout the Perseids shower period. Running a 3CX800-A7 amplifier and two 9-element Yagis, he made FSK441 contacts with the 144MHz stations of EC1DMY, HB9CAT/P, HB9FAP, IK1MTZ, LA/DL1NRW, LY2WR, OH1ND, OH1XT, OH3AWW, OH6KTL, OH8K, OK2POI, OZ1SKY, RA1WU, RA1WZ, S51AT, SM2GCR, SP2NJI, YT1VP and 9A3JH/P. Ray mentions that he was particularly pleased to work OK2POI (Czech Republic) on the 432MHz band. This was his first MS contact on that UHF band, taking 1 hour 35 minutes to complete.

Although there are no major meteor showers in September the sporadic meteor flux is at its annual maximum during this period. This provided relatively good reflection rates especially during the early morning hours. Brian Oughton, G4AEZ, operator of the Selex Galileo club station G8VYK (Essex, JO01) reports making his longest distance contact on 10 September when he worked the station of SV8/HA1YA (Greece, KM08) at 2119km distant. The 144MHz station at G8VYK is all home-made by G4AEZ except for the Kenwood TS-2000 transceiver and consists of a 400W solid-state amplifier feeding four 9-element DK7ZB Yagis and an MGF1302 low noise preamplifier.

TROPOSPHERIC PROPAGATION. As a generalisation, most signals transmitted in the VHF and UHF bands are normally confined within the troposphere. This is the layer of the atmosphere closest to the earth surface and extends to a height of about 10km above the Earth. Tropospheric radio waves that travel near the surface of the earth without going through the ionosphere

are referred to as ground waves. As these waves travel over the surface of the earth they weaken until they reach a level that is no longer useful. If the atmosphere is not disturbed or modified by a particular weather pattern the received signal level will decrease in a predictable fashion with increasing distance. It is during these periods when the atmosphere is not being disturbed that VHF operators describe the conditions as being 'flat'. However as you probably already know the lowest few kilometres of the troposphere are often quite variable. Indeed it is in this region near the earth's surface that weather changes occur and influence our climate and daily activities. It is some of these changes in weather patterns that reward the observant operator on the VHF and UHF bands with long distance contacts. Unlike other short-lived propagation modes such as Es or Au propagation, tropospheric enhancements are usually the culmination of several days build up and will last for many hours, if not days at a time.

Tropospheric propagation on the 144MHz band was quite reasonable throughout much of September with numerous CW and SSB contacts being made with stations up to 1000km distant. The IARU Region 1 144MHz contest on 4-5 September certainly helped to create much activity with contesters such as AO2A, DR1F, EE2W, HB9GT, I2FAK, LX/OO7W, OZ1BEF and TM0W being worked by many UK stations.

The best propagation paths during the month were reported by operators located in southern England and Wales to stations located in southern France, Spain and Portugal. Amongst those worked on CW and SSB were CT1ANO (IN51), EA1MX (IN73), EA1UU (IN83), F4DSD (JN23) and F5ICN (JN03). For the fourth month running, stations situated close to the coast in Cornwall could make tropo contacts into the Canary Islands with the station of EA8AVI (Las Palmas, IL28) putting in an appearance during the evening of 3 September. Interestingly, although this 3000km path opens up quite regularly during the period between May and October, the slightly shorter 2300km path to the Azores is considerably more elusive. I find this surprising as there are a number of active CW and SSB operators scattered amongst the nine major islands that make up the Azores archipelago, approximately 1500km west of Lisbon, Portugal.

The first indication that tropo propagation existed between the UK and the Azores came during the evening of 12 September when stations in south-west England reported hearing the *Dubus* sponsored beacon CU8DUB (144.420MHz) with signals peaking up to 579 at times. (*Dubus* is an amateur radio magazine, published in Germany, intended for the serious VHF and up operator.) By the following morning, 13 September, transmissions from the beacon had enhanced considerably with Cornish stations reporting 599 signals. News then spread amongst the islands, which extend for more than 600km, that propagation was excellent towards the UK. For around 11 hours between 1215-2300UTC the stations of CU3EQ, CU7BC and CU8AO made CW and SSB contacts with stations in southern England and south-west France (see **Figure 1**). By 14 September it was all over apart from occasional reception reports of the CU8DUB beacon that was heard on and off throughout the day until 1700UTC.

"It was a great day making all these long-distance tropo contacts" reports Jose Vitor, CU3EQ (Terceira Island, HM68). His first contact at 1443UTC on 13 September was over a 2114km path to the station of G4LOH (Cornwall) with SSB signals peaking 55. Running a Kenwood TS-2000 transceiver, 100W and a 10-element DK7ZB Yagi he then went on to contact M0VRL (Cornwall) at 2172km, G4CQM (Devon) at 2198km, G4RRA (Devon) at 2232km and G7RAU (Isle of Wight) at 2393km distant.

Marco Dutra, CU7BC (Faial Island, HM58) reports that when he heard about the tropo opening he only had one small vertical antenna on the mast. Acting quickly he attached a horizontally polarised Yagi onto the tower, pointing it in the general direction of the UK. Although he only made one SSB contact, with the station of G4LOH, it was his furthest distance contact on the 144MHz band at 2250km. Marco reports that he hasn't got his 144MHz station set up yet, a Kenwood TS-2000 transceiver and 120W amplifier, but expects to have a group of four 11-element DL6WU Yagis fully installed later this year.

Fred Fournier, CU8AO (Flores Island, HM49) mentions that this was one of the greatest openings to the UK that he has ever experienced. He uses a Yaesu FT-847 transceiver driving a 100W amplifier and a 9-element F9FT Yagi (see **Photo 1**). On 13 September he worked the 144MHz SSB stations of M0VRL (IO70), G4ALY (IO70), G4CQM (IO70), G4LOH (IO70), G4RRA (IO80), G6HIE (IO90) at 2688km and G7RAU (IO90) at 2630km. Fred also worked 13 French stations around 2300km distant and F6FHP (IN94) on the 432MHz band over a path of 2487km.

Paul Pasquet, G4RRA (Devon, IO80) was thrilled to work both CU3EQ and CU8AO as he has been trying for decades to work into the Azores on the 144MHz band. Paul mentions that signal strengths were swinging about all over the place. The station of CU8AO was occasionally heard calling CQ but would be leaving big gaps in between the transmissions. Often his SSB signal would be just above the noise level but occasionally it would peak to 59+. The station of CU3EQ on the other hand was heard calling on CW almost continuously and that is how Paul managed to hear him. His signals were generally very weak but because of his technique Paul managed to work him when signals were slightly enhanced.

Incidentally some of the best tropospheric ducting enhancements often occur during the autumn months of October and November. It frequently occurs when visibility is hazy. So keep a look out for weather forecasts where fog or mist is indicated and high pressure extends from the UK deep into Europe.

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

TABLE 1: Top VHF DX contacts made from the UK during 2010.

Band	Mode	Date	UK/Locator	DX/Locator	Distance
6m	Es	31 May	G0JHC (IO83)	9M2TO (OJ05)	10370km
4m	Es	5 July	G4DEZ (JO03)	D44TD (HM86)	4530km
2m	Es	2 Aug	GI6ATZ (IO74)	EA8TJ (IL18)	3020km
2m	Tropo	18 July	G4CBW (IO83)	EA8TX (IL18)	2989km
2m	MS	13 Aug	G8VHI (IO92)	LZ9X (KN32)	2319km
2m	Au	2 May	G4RRA (IO80)	LY2WR (KO24)	1943km

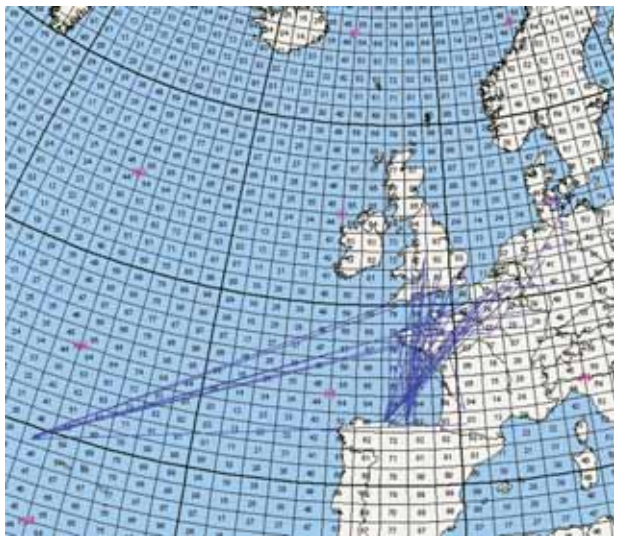

FIGURE 1: The tropo opening to the Azores on 13 September. Diagram courtesy of Make More Miles on VHF (www.mmmonvhf.de).

GHz Bands

Getting started on 24GHz - continued

PHOTO 1: Millitech 2.5W amplifier together with a smaller 500mW Milliwave power amplifier.

GETTING STARTED ON 24GHz. In the first part of this short series I covered transverters and local oscillators, together with low noise amplifiers for the front end. In this second part I will be looking at power amplifiers, changeover relays and antennas.

POWER AMPLIFIERS. RF power is still expensive at 24GHz. However, as radio amateurs we are fortunate to have access to surplus solid state power amplifiers (SSPA) that were designed for commercial use at 24GHz and on adjacent bands such as 22GHz - 23GHz (Mercury, remember them?) and 26GHz. However, most of these amplifiers are limited to a few hundred milliwatts output, although a few (such as the Millitech amplifier) can provide as much as 2.5W output. Power supply requirements tend to be in the range 5 to 12V, with the odd amplifier also requiring a negative supply at 5 or 8V. **Photo 1** shows a Millitech 2.5W amplifier together with a smaller 500mW Milliwave power amplifier. Power amplifiers are required to raise the output from low level transverters to a more useful level.

The great thing about many of these surplus amplifiers is that they often have a gain of between 40 and 55dB. This means that you don't have to be too careful about the loss between the transverter and the transmit amplifier. An SMA or waveguide attenuator is the best way to lose excess gain. This does not mean you can be careless about the interstage connection as a poor match, due perhaps due to a cheap connector or damaged waveguide, is not a good idea. Avoid the bright, gold coloured SMA coaxial connectors from some Asian suppliers that are often used for Wi-Fi systems. These are often very lossy above 2.4GHz.

With high gain comes the ability to drive the amplifier directly from a low power transverter. This might be one of the popular DB6NT transverters that can provide typically -7dBm output. With a 50dB gain power amplifier capable of 500mW output (+27dBm) there will be an excess of 16dB of gain (50 - (27+ (-7)), requiring a 16dB attenuator. Do not be tempted to use a length of lossy coaxial cable, such as RG174, since this will not look anything like 50Ω at 24GHz and may cause instability.

If the high gain power amplifier was originally designed for 22 - 23GHz it is important to provide really good bandpass filtering between the transverter output and the amplifier input, since the amplifier gain may be even higher at the transverter image or local oscillator frequency. For example, with a 432MHz IF the local oscillator will be at 23616MHz (24048MHz - 432MHz) and the image will be at 23184MHz (24048MHz - (2 x 432MHz)). Both of these unwanted signals may be within the original frequency range of the power amplifier and could be strongly amplified at the output of the amplifier. A two pole filter will almost certainly be marginal when used with a 24GHz transverter that has a 144MHz IF.

Most surplus 24GHz power amplifiers seem to have waveguide 20 or 22 outputs. The inputs can be either coaxial or waveguide. Good quality amplifiers meant for 24GHz or above will have SMA 3.5 or APC 3.5 input connectors to avoid possible performance fall-off often seen with standard SMA connectors above about 23GHz.

ANTENNA CHANGEOVER. This can be one of the most difficult problems to solve. The choice of whether to use waveguide or coax is often made depending on the amplifier, transverter, filter and antenna that you own and want to use. A common solution is to use coaxial cable in the low level stages and the local oscillator to transverter connections, with waveguide used to connect the power amplifier and low noise preamplifier to the antenna. This usually means using a waveguide relay between these modules and the antenna feed. Fortunately, surplus Relcomm waveguide relays became available in the UK several years ago. G3PHO imported a large number of these from the New Zealand dealer for use by UK enthusiasts. Best of all, the Relcomm waveguide relays were really low cost. There must be a very large number of Relcomm 8 volt working relays lying, unused, on the shelves of many UK radio amateurs!

One possible disadvantage of these waveguide relays is that you might need to use an adapter on each of the three waveguide ports to connect to the power amplifier, preamplifier and antenna feed if these use waveguide 20, since the waveguide relay uses WG22. Suitable waveguide adapters were available from the UK Microwave Group at one time.

Personally, I prefer to use coaxial relays for the changeover function as it is often much easier to bend coaxial cable to fit into the tight corners in the average transverter.

Of course, the coaxial approach is lossier than using waveguide and so it is worth minimizing the length of cable between the relay, power amplifier and preamplifier. If taking this approach look for SMA 3.5 connectorised relays. These are usually

PHOTO 2: Relcomm waveguide switch with two short lengths of waveguide 22 and a pair of SMA 3.5 equipped relays suitable for low loss 24GHz antenna changeover use.

PHOTO 3: NE8I standing next to his two-dish 10GHz Rover station, as used in the recent ARRL 10 and 24GHz Cumulative contest. Photo: NE81.

PHOTO 4: G3XDY receiving the G3VVB award for winning the 2010 Microwave Construction contest with his 1.3GHz solid state power amplifier. The trophy was presented by Allan, G8LSD, one of the three judges. Photo: G0FDZ.

rated to 26.5GHz, thus guaranteeing low loss at 24GHz. The MA/COM 7530 series relay is particularly low loss and rated to 50W at 24GHz. **Photo 2** shows a Relcomm waveguide switch next to a pair of SMA3.5 equipped relays.

An alternative approach is not to use any relays or waveguide switches, but instead to use two separate antennas. This has the advantage of minimizing losses on transmit and receive, since the preamp and/or power amplifier can be mounted directly to the antenna feed. The obvious disadvantage is that two antennas are required and the extra windage might make this undesirable for portable operation.

ANTENNAS FOR 24GHz. These are usually dishes with a waveguide feed. The larger the dish the narrower the beamwidth, so for both portable and home station use this tends to limit the dish size to no more than 90-100cm in diameter, with 30-45cm a more common size. Both prime focus and offset dishes are suitable and the small 45cm size of Sky offset minidish is quite popular with 24GHz enthusiasts. The larger size version of this (often used for its intended purpose of digital satellite TV in more northerly areas of the UK) is also worth considering if you are able to handle the narrower beamwidth.

You must consider the focus to diameter (f/D) ratio of the dish when selecting a suitable feed. This is often forgotten. Offset dishes usually have much longer f/D ratios, meaning that the focus is farther from the dish than most common prime focus dishes. The illuminating feed for an offset dish must have more gain and hence narrower beamwidth that a feed for most common prime focus dishes if the dish antenna is to produce maximum gain. A feed designed to illuminate a typical 0.4 f/D dish will result in reduced gain from an offset dish with a more typical f/D of 0.7 (Sky minidish) as much of the transmit energy will fall beyond the rim of the dish. At 24GHz low noise considerations are not normally a concern and therefore ground noise pick up (spill-over) is usually a secondary consideration to transmit gain.

For short distance contacts a small horn antenna of, say, 20dBi gain will often suffice. However, 24GHz is a band where losses can be higher than expected and the use of as much antenna gain as possible is highly recommended for consistent success.

In the third and final part of this series I will cover what you might expect from operating on 24GHz now that you have built your system.

BAND ACTIVITY. Firstly this month we have some band activity news from the USA. Lloyd, NE8I from Michigan, went out in the portable in the second weekend of the ARRL 10GHz and up Cumulative contest. On the Saturday he operated from Ludington (EN64), at the State Park and then from Manistee, Schoedel Road (EN64). From there he moved to the Aylesworth-Johnson Scenic overlook (EN74) and there worked WA9O (EN43) for his longest 10GHz contact, 255 miles. Lots of scattered rain showers, on both days, meant that most of the contacts were by rain scatter. Lloyd is shown in **Photo 3**, standing next to his two-dish 10GHz Rover system at Aylesworth-Johnson. On the Sunday he went to Tustin Knob (EN74) from where he worked K3SIW (EN64) on 24GHz and heard KB8U and KB8VAO on rain scatter. In all, Lloyd had 21 contacts, of which 18 were on 10GHz and three on 24GHz.

His Rover station uses the small 4-el 144MHz Yagi for talkback. The 10GHz system consists of a DB6NT transverter and preamplifier, DL2AM 18W power amplifier and a commercial 10GHz 66cm dish with shepherds-crook feed. His IF radio is an FT-817. Yes, there are 2 dishes!

On 24GHz he has two systems. The first is a new 24GHz transmitter set up consisting of a 4W W2PED amplifier and a commercial horn that he found surplus with its calibration papers showing 42dB gain at 24GHz. The local oscillator is a DB6NT 24GHz unit.The second system consists of a 66cm dish with DB6NT transverter into a surplus 1W amplifier.

Lloyd also sent a report on activity around Lake Erie during the first Cumulative weekend. Space precludes me from including that report at present.

From closer to home, the UKAC contest on the third Tuesday of the month continues to grow. The event on the 23rd September drew a record number of participants for this 1.3 and 2.3GHz event. Ray, GM4CXM reports at least 13 stations active on 1.3GHz from GM although he bemoans the fact that there are only one or two regular operators participating from GI and GW.

Robert, GM4UGF/P operated from Tinto (IO85). He reports the wind as a bit strong in that part of the world, such that his 26 element, 1.3GHz DL6WU Yagi was moving about rather wildly. Robert's best DX was G4BRK (IO91) to the south and GM3UAG/P (IO87) to the north.

Conditions in the south of the UK during the contest were maybe a little above average with clear skies and a bright, full, Harvest moon to make for a pleasant evening for those out portable south of the border.

2.3GHz does not seem to be getting too many reports. It can't be because of lack of equipment since high power amplifiers and low noise preamps are readily available. I wonder if the growing numbers of 1.3GHz stations are taking their toll because no one wants to QSY to 13cm whilst there are still lots of stations to work on the lower band?

FORTHCOMING MICROWAVE EVENTS - 2010

Martlesham Microwave Round Table, 13 and 14 November. Details at http://mmrt.homedns.org

CRAWLEY MICROWAVE ROUND TABLE. There is just enough space left to mention the Crawley Microwave Round Table held on 12 September. The distinguishing feature of this meeting is the judging of the microwave construction contest. This year the contest was won by John, G3XDY for his beautifully built 1.3GHz 500W solid state power amplifier. The entries of Dave, G4HUP and Mike, G3LYP, were highly commended.

Congratulations to John on winning the G3VVB trophy. This will be suitably engraved and re-presented to John at the November Martlesham Microwave Round Table.

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Design Notes

A mixed bag of hints and tips this month

PHOTO 1: Low cost surplus UHF PA module with a medium power modamp for a compact UHF power amplifier capable of several watts output.

POWER AMPLIFIER MODULES. At a rally I took a gamble and purchased a pair of UHF power modules type M68732SL on the assumption they might do something useful one day. The tag on the box suggested they worked over 330 – 380MHz with about 7W output power. The modules looked lonely and unloved amongst all the amateur radio customers, but they did only cost £1 each! On testing in a breadboard layout, to my surprise, they worked reasonably well at 432MHz. Gain was appreciably down – needing over 100mW of drive to give 3W of RF at 432MHz rather than the 18dBm (63mW) for full output as specified. Overall efficiency measured as RF output divided by DC power in was not appreciably worse than at lower frequencies and this is what really matters in a small power amplifier. So by driving with 19-20dBm I could get a reliable 2 – 3 watts of RF at 432MHz. Ideal for a low power beacon or transmitter source – and very, very, much cheaper than the proper module for this frequency band. **Photo 1** shows a breadboard amplifier module with a medium power SGA6289 modamp supplying the drive. I have a stock of these modamp devices, but a MiniCircuits ERA-3 or ERA-6 would do similarly well. An LM317 voltage regulator gave the 7.2 – 8V supply needed for the module and could just about cope with its current consumption. The preset resistor adjusts gate bias over the range 1 – 4V to optimise power output and gain. The small separate PCB contains switching circuitry to control the PA module by switching its gate drive on demand from a microcontroller.

Copper shim under the PA module, which can be seen in the photograph, soldered to the ground of the PCB is strongly advisable – especially at UHF – to give a proper grounding path for the amplifier; it even helps thermal conductivity to the heatsink.

CHEAP AS CHIPS. PA modules have become *de rigueur* in most VHF through UHF transmitters, to the extent that they are frequently cheaper, brand new, than all the components needed for discrete power amplifiers of up several tens of watts. By the time the costs and complications of higher voltage trimmer capacitors, PCBs, bias components decoupling capacitors and coils have all been included, it is usually better, even as amateurs willing to make the effort, to just go and buy a suitable PA module. A range suitable modules can be found at **[1]**.

These modules often turn up at rallies – look in the bottom boxes for that old PMR or amateur transceiver that's only junk and can't be converted. Chances are it's got a PA module that can be recovered – and might even have a few more components worth unsoldering. Older units will probably be Class C, so only useful for FM or carrier operation, but the more modern devices are MOSFET based and are inherently linear.

ROTARY ENCODER. Many users of SDR software prefer a proper tuning wheel for setting frequency – plug in USB devices such as the Griffin Powermate **[2]** are popular, but they are certainly not cheap. In a posting to the Yahoo Digital Group, Vojtech OK1IAK / AB2ZA suggests a low cost alternative. He writes: "Just buy a cheap mouse (Genius NetScroll 1200 is shown in the picture) and replace the wheel optical encoder with a panel mount rotary encoder with knob. It is certainly a cheaper solution than to buying a dedicated knob product" **[3]**. Panel mount encoders are available from many catalogue suppliers, the ALPS EC11B15242 (Farnell part number 1191734) is just one example. Suitable devices can also probably be salvaged from surplus rally purchases.

TRANSMISSION LINE TRANSFORMERS (TLT). These devices seem to be a widely misunderstood component amongst radio amateurs as well as others in the RF design field. The most important thing to realise is that *TLTs are not transformers in the conventional sense* (in other words, they do not pass power from one winding to another through a magnetic core of iron or ferrite). Some TLT designs don't even need a core at all – air wound ones are quite common. The misconception is not helped by the fact that on many circuit diagrams TLTs are shown with the same symbol as a conventional transformer.

So what is the basis behind a TLT? It is no more than a length of transmission line. We won't worry about its characteristic impedance for now, or about its (electrical) length, or even about its construction, which could be coaxial or twisted pair. What we do care about is that it is a pair of conductors that take in RF power from one end and deliver this to a load at the other end. For now we will assume it is lossless. This piece of transmission line can be coiled up, bent, wound round a toroid, a piece of iron or even a rusty nail without changing its transmission line properties. It still delivers RF in at one end to a load at the other end. For now, if it helps, think of doing this with a length of coax keeping all impedances at 50Ω. Exactly the same rules apply to twisted pair.

Next stage: Take this length of twisted pair (or coax if you like) coil it up so it looks like an inductor as shown in **Photo 2**. Measuring the inductance between the beginning and end of each conductor, ie between points *a - a'* and *b - b'* should give two identical values. But it is still a length of transmission line delivering RF into a load with no attenuation. Wind sufficient turns to give an inductance that has a reactance significantly higher than our working impedance – generally a value of four times or higher is considered reasonable for most RF work, so 200Ω reactance for 50Ω systems is a good starting point. As far as RF travelling along it is concerned, it is still just a piece of coiled line delivering power to a load connected at *a' – b'* from the input on *a – b*.

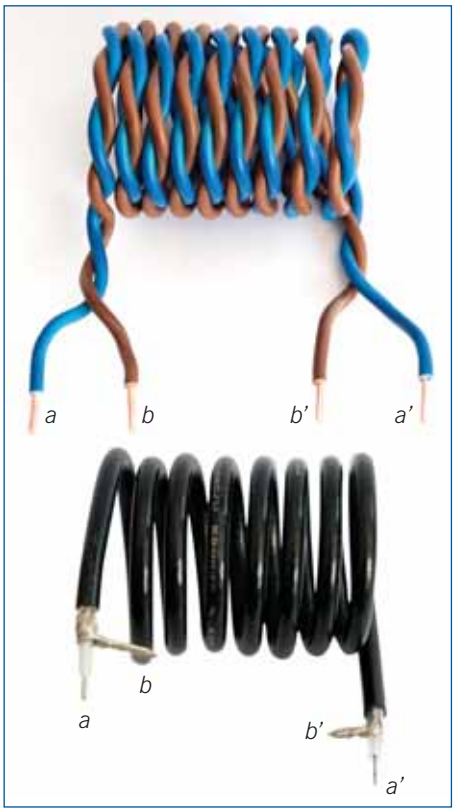

PHOTO 2: The essential element of a transmission line transformer in both parallel-pair and coaxial construction. The line is coiled up so inductive reactance between *a* and *a'* or *b* and *b'* is high enough to not affect circuit operation.

BUT, we have isolated the load from the source by inserting a common mode choke. The RF doesn't know this as its going along the line, but when it reaches the load it cannot have any view of the source terminals – one of which may or may not have been ground to start with. The output is completely floating with respect to the source. This is the common mode choke, frequently found in antennas as a choke balun, used for feeding dipoles from unbalanced coax sources. We don't yet have any impedance transformation.

Now take three identical pieces of twisted pair (or coax, it still doesn't matter what type of line is used) and coil each up in an identical way to give an inductor of arbitrarily high reactance. Connect three as shown in **Figure 1** so the inputs are in parallel and the outputs in series. What have we got, remembering that the output of each TR line is completely decoupled with respect to its input but what goes in comes out unmodified? An RF voltage V_{in} applied across all three parallel connections at points *a – a'* will appear unmodified at each of *b – b', c – c'* and *d – d'*, which are connected in series. So the voltage across the output terminals *b' – d'* is three times V_{in}. From the law of conservation of power, the output current I_{out} must be equal to I_{in} / 3, so we have transformed the impedance by a factor of 9, eg from 16.667Ω to 150Ω (staying with the magical 50Ω figure). We have an air-wound 1:9 impedance transformer – and still not a ferrite core in sight!

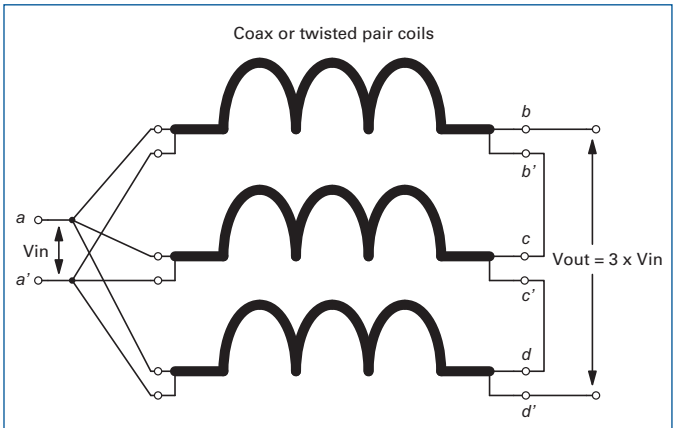

FIGURE 1: A 1:9 impedance transformation made from three lengths of coiled transmission line.

Air wound inductors become a bit large at HF (and even at low VHF - see **Photo 3**) so we need to increase the common mode reactance by winding the transmission line around a core. Toroids, ferrite balun cores, rings etc are all suitable. The only thing that matters is that the resulting common mode inductance is significantly greater (more than four times) the impedance of interest. As the core doesn't carry the actual power being transferred it is not that critical in its make up – but not all ferrites are created equal and there are some rules governing what sort of core can be used for certain frequencies.

At the lowest frequencies of interest, we need to make sure the ferrite does not saturate. The critical factor is the magnetic field density, or B (measured in units called *teslas*) within the core that is generated by the voltage applied. It is not current that causes B, it is the voltage time product, so the allowable voltage is directly related to frequency and turns. For a sine wave, the following formula applies: V = 4.44 x F x N x A x B, where F is the frequency in Hz, N the number of turns, A the cross sectional area of the core in square metres and B the allowable flux density. For most ferrite types, keeping B below 0.1 is usually acceptable. So let's illustrate this with the typical small ferrite toroid of around 12mm diameter found in many amateur HF power amplifier designs at 3.5MHz. We usually see about 5 turns wound on this size of core, which has a cross section about 4mm wide by 1.5mm thick, in other words it has a core area of 6mm^2 (or 6 x 10^{-6} m^2).

Using a value for B_{max} of 0.1 tesla, V = 4.44 x 3.5 x 10^6 x 5 x 6 x 10^{-6} x 0.1 = 47V RMS. In a 50Ω system, this corresponds to 43W – which all stacks up with what we see in practical designs. As frequency increases, the number of turns could decrease and the power rating increase. But, conversely, if used at Top Band, only 20W is now allowed without increasing the number of turns. There is no theoretical upper limit to the frequency of operation – just a lower limit.

But things are not quite so simple. We have assumed all along that the length of transmission line is insignificant, along with its characteristic impedance. As frequency rises this is no longer the case. Where the length of line becomes greater than about 0.1λ, we begin to see normal transmission line effects and unwanted impedance transformation (due to the discrepancy between input and output impedances and the line characteristic impedance, Z_o). However, for a ferrite loaded transformer such as the one discussed with 5 turns, which might have a total winding length of 80mm, this upper limit comes at a wavelength of 800mm – or 375MHz. The other unknown is the ferrite material. Some ferrites become quite lossy at high frequencies – and this really is an unknown with surplus ferrites. Some, particularly those designed for EMC and suppression, become quite lossy at upper HF to VHF. They usually have quite a high permeability so are more suited for low frequency operation. Other ferrites have a low permeability, so don't increase inductance too much, making them less attractive at low frequencies but usable up into the GHz range. The best solution with an unknown core is to try things and see – use an inductance meter if you have one to estimate the number of turns needed.

Martin, G8JNJ has made a study of transmission line transformers, mainly aimed at baluns, and a paper on his findings can be found at **[4]**.

WEBSEARCH

[1] RF components supplier with a wide range of RF power modules: www.rfmicrowave.it/home.php?lang=eng
[2] Griffin Powermate tuning knob: www.griffintechnology.com/products/powermate
[3] www.cq.sk/img/sdr_rotacny_enkoder.jpg
[4] http://g8jnj.webs.com/Balun%20construction.pdf

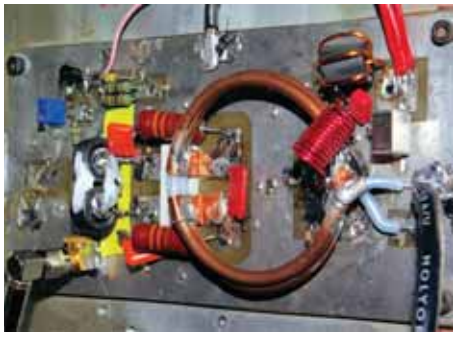

PHOTO 3: Air cored coaxial 1:4 transmission line transformer used for the output matching of a 250W VHF linear amplifier.

Soldering surface mount devices

Some hints and tips to ease the process

PHOTO 1: Good magnification is essential, as is close working. The small fan is to disperse smoke from the flux.

FREQUENTLY SEEN. Kits involving surface mount devices (SMD) are becoming more widespread, but, unfortunately, many potential builders are put off – as I was for a long time – by the perceived difficulty of soldering the tiny components to the PCB. SMDs are designed for mass production with complicated machinery [1]; commercial manufacturers have the resources to pay for research and equipment beyond our dreams, building and scrapping lots of prototypes in order to develop an effective, low cost product. We are commonly building one-offs, many including expensive components that we can't afford to damage; but we do have the advantage that we can allow ourselves the time to be more patient and cautious. After all, we have to get it right at the first attempt.

There is plenty of advice out there [2]. I have read a lot of it, including an excellent article here in *RadCom* [3] and I have tried many of the approaches suggested. Now, after a lot of frustrating struggle I have come up with strategies that, with care and patience, will easily give perfect results every time, with no fancy equipment and only normal soldering skills.

Of course you need a soldering iron and I do not go along with the common recommendation of a low wattage iron. They have a long warm up time, their temperature depends on the heat loss from a constant power input – guesswork really – and their tip cools down on every joint. I use an Antex TS 50W temperature controlled iron (any similar one would do just as well), with a 50 watt element. It heats up from cold in well under a minute and copes with all my PCB soldering – the right temperature for tiny work and plenty of oomph to flow heat into bigger jobs. For SMDs I use a new, or at least still sharp, 0.5 mm tip.

And so to solder. I use only tin/lead solder; I cannot get on with the lead-free stuff. This is legal as long as I don't sell what I make [4]. However, there could be problems if tin/lead and lead-free are mixed in the same joint. You may not know if a PCB has been tinned with lead-free solder and vice-versa if you do use lead-free. Presumably PCBs bought as part of a kit have to be lead-free, but unfortunately very few manufacturers actually say so on the board.

PHOTO 2: A method for holding components if the lands are flat.

I can only say that I have noticed no problems myself. For SMT ICs, I recommend tinning the mating surfaces and then joining them by melting them together with no more solder added. If care is taken to make sure that the tinning is well melted and adhered to the surface, there should be no weakness in the actual joint, whatever solder you choose to use. As far as I can tell, if you finish up with a homogenous alloy of all the metals in the solders then it will be all right [5]. The metallurgy is a complicated subject and I have neither the expertise nor the room to discuss it further here.

A fine gauge flux-cored solder is essential, less than 1mm diameter. And the real secret of success is to use as little solder as possible. Flux too. Many of you will have your own ideas about solder and flux; I am reporting here what works for me. Cored solder contains rosin, also called colophony. Sometimes additional flux is needed; for most of my life I have used Fluxite. I will be scourged for suggesting it but, although this is really a plumber's acid flux containing zinc chloride, my earliest builds still do not show any signs of corrosion, though admittedly they have all been kept and used at normal room temperature and humidity. An extensive internet search was only confusing and there seem to be disadvantages with all types of flux. Choosing an alternative wasn't easy since, again, manufacturers are geared up for mass production, not for amateurs with soldering irons.

But, if we use cored solder, why is more flux necessary? When soldering through-hole and other large components, enough flux comes from the solder as you feed it in. However, the technique described here for SMD ICs involves tinning the mating surfaces and joining them without adding any more solder. When tinning these tiny components and lands, trying to achieve a thin layer of solder, I find with cored solder that too much has to

PHOTO 3: Holding the component firmly in place with a cocktail stick held in sprung tweezers.

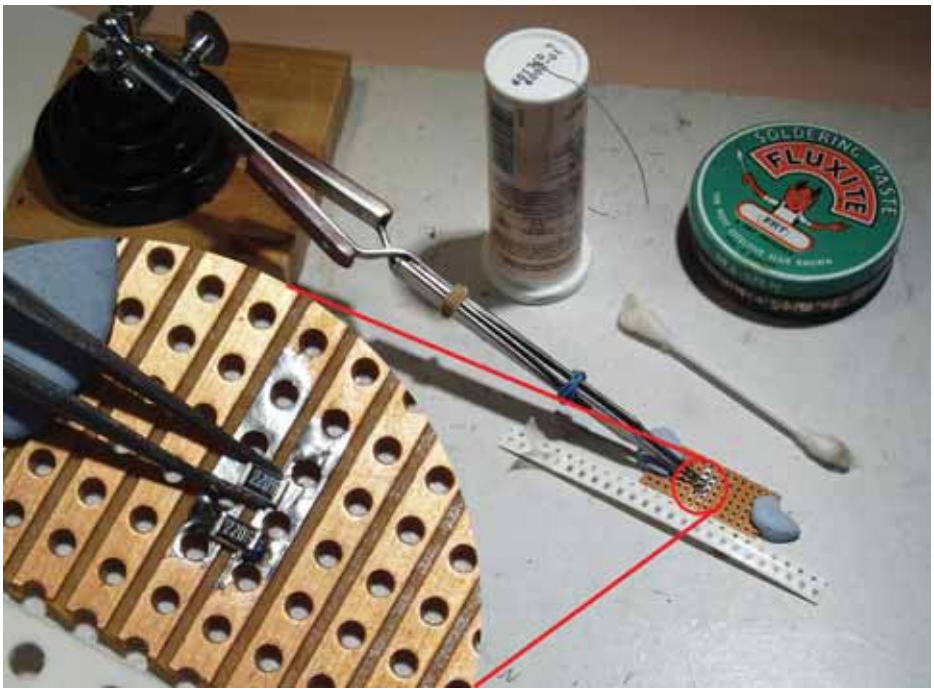

PHOTO 4: A way to hold components that are liable to slip off the land under pressure. The tube at the back is my home made solder dispenser, and the cotton bud stick was used to wipe off excess solder from the copper strips. The lower resistor is already soldered; the upper is held in place ready for soldering.

be melted before the flux takes effect. I prefer to do the tinning by smearing a very small amount of flux on the surface, then using the iron with an almost dry tip. Clean it on the sponge, then with a brief touch on the solder, the flux from the core burns off, leaving just enough solder on the bit to tin the already fluxed area.

To see the work properly you have to get really close, just a few inches from it. Your eyes won't focus at this distance, so you need a really good magnifier. Without help, other than my reading glasses, my eye focuses about fourteen inches from the work. For most work on PCBs I use a loupe that puts my eyes about six inches away and, for very close work, a watchmaker's eyeglass clipped to my right spectacle lens: that puts my eye about three inches away. My nose is even closer, but I am right handed and I've not yet poked it with the soldering iron approaching from the right – see **Photo 1**.

SOLDER SMOKE. There are some health issues involved with the smoke from flux. It turns out **[6]** that lead does not give off significant vapour below 500°C, so we are safe at soft-soldering temperatures. The real danger is in the fumes from the flux, colophony or acid, which can cause respiratory and other problems **[7]**. I use a small fan to disperse the smoke away from my face: it can be seen in the photographs. Eye protection is also recommended against spitting flux.

A lot of people tell me that their hand shakes too much to do this fine work. I find, surprisingly, that my hand steadies up as the tip of the iron approaches the work. As Ian, GM3SEK says in [3], this is because the closed loop of adjustment, via eye, brain and hand, uses the magnified movement to scale down the usual tremor, so don't be afraid – have a go.

HOLDING THE PARTS STILL. The next thing to consider is holding the stuff down – it is no good chasing tiny little components around the work bench (or, even worse, trying to find them on the floor). You can build elaborate apparatus for holding the PCB and components in place, but I prefer the simple methods I will describe here.

I work on a sheet of thick card, over my anti-static mat – the lumps of solder already melted into it explain why – and it allows me to stick nearly everything down and together with Blu-Tack. Brilliant stuff for temporary fixings: it sticks screws to screwdrivers, nuts to spanners and PCBs to the workbench. Near hot spots (especially on SMDs) I have to use other methods, as the Blu-Tack itself melts and can spoil the work.

The longest part of the job is positioning the SMD components and holding them in place. Some recommend gripping them in hand-held tweezers while you are soldering them: I don't like this; it gives too much opportunity for the component to slide about at the wrong moment and end up just off where it should be. I want the component in position and held firmly before I start soldering, with both hands available – one for the iron and the other for the solder if I need it.

The ubiquitous '1206' size, of capacitors and 1/8 watt resistors, 3.2 by 1.6mm, is fairly easy to deal with without any extra flux.

PHOTO 5: An IC upside down in a slot in a card, ready for tinning, and the piece of plastic cut to grip it for soldering to the PCB

For a quick way to hold them in place I use a wooden toothpick or blunted cocktail stick in a clamp, adjusted to give a gentle resilient pressure on the component, as shown in **Photo 2**. Be careful, as too much pressure can flip the chip out, and it's gone. It usually takes me a while to tweak the component into exactly the right place under the clamp, **Photo 3**, but finally I can feed a drop of flux cored solder in, applying the bit to the exposed part of the land first and letting the surface tension of the solder suck it in to make a perfect joint. I assume that the amount of solder applied will overwhelm that already on the work, so there should be no problem with mixing lead-free and tin/lead if the result is nice shiny fillets. Most kits for amateurs do not use smaller sizes than 1206, but I have successfully used the same technique down to 0603, 1.6 by 0.8mm. Once one end is soldered the clamp can be removed and the job rotated to solder the other end.

However, I sometimes find that the slight bulge of tinning on the land makes the component slip off under the pressure. In that case a bit of ingenuity with spring loaded tweezers on a heavy base, fine pointed tweezers and a couple of elastic bands does hold a resistor or capacitor securely and precisely, as seen in **Photo 4**. The small pot at the back is my home-made solder dispenser.

The clamp down, as well as preventing movement, is to avoid 'tomb-stoning' where the molten solder grabs one end and tips the SMD vertically. There can also be similar mishaps where surface tension in the solder sticks the component to the soldering iron and pulls it away from the PCB.

I also recommend starting with a bit of practice as a good way to gain confidence. The 1206 size of resistor fits nicely across the gap of 1/10th inch stripboard and these resistors are cheap enough to waste a few trying things out on a spare piece of board. Flux and thinly tin the copper first. If the solder is too thick, a quick wipe with a cotton bud stick while it is still molten will take off the surplus. Clean and wet the bit with solder, then have a go. Photo 4 shows one resistor soldered, and another held by the tweezers and ready.

Another practice I would recommend is to position resistors so that the values shown on the tops are all aligned the same way, matching any printing on the board. In Photo 4 you can see that, without strong magnification, '2201'

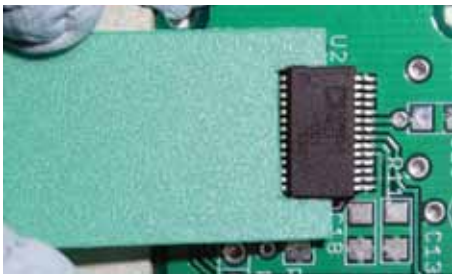

PHOTO 6: The chip from Photo 5 in place ready to be soldered.

could easily be misread as '1022' the other way up. This applies to any labelled component where you have a choice. Capacitors are not usually labelled, so be careful not to mix them up. Good practice is to solder on all of one value at a time. They are generally supplied in strips, making this easy.

MULTI-LEG DEVICES. SMD ICs are a different matter, often with closely spaced pins that are far too easy to bridge over if you are feeding solder into the joint. A common recommendation (including in [3]) for soldering SMD ICs is to put a lot of solder all over the pins, with the chip in place on its lands, then soak up the surplus with solder wick. I have never got on with this method. To me it seems like decorating a wall by throwing bucketfuls of paint at it and then trying to wipe off the doors and windows. The heat required to melt the solder through the wick is a danger to the device (and leaves a lot of flux residue if you have used cored solder). When I tried this approach with an SOIC chip, I gave up after finding the wick firmly soldered to the pins as I poured more and more solder on, to try to get a good thermal contact from the iron. I had to cut off the SMD pins, unsolder the remnants stuck to the lands, remove the solder with a solder sucker and finally solder a new chip in its place. I did that new one by holding the chip in place as I described for 1206 and carefully soldering each pin. On an SOIC package with pins on a 1.27mm pitch it was just feasible to solder one pin at a time by holding the wetted iron bit on the land next to it and feeding a tiny drop of solder in.

Then I bought a DDS-60 kit from AMQRP **[8]** for a 1Hz to 60MHz VFO with a view to using this in a general purpose sine wave generator. The beating heart of this is the AD9851, available only in a 28 pin SSOP (Shrink Small Outline Package) DIP with fourteen 0.38mm wide pins, 0.27mm gaps, on a 0.65mm pitch, each side, that is about half the spacing of an SOIC chip. (This is the same pin spacing and size as the Cypress CY7C68013A described in [3], although that does have 28 pins on each side).

On this PCB, pins 26, 27 and 28 are all grounded so I experimented with these as it would not matter if the gaps were bridged. I found it almost impossible not to get too much solder over the pin when applying cored solder directly to the joint, so, with no spare chip if it all went wrong, I had to find a more precise and deliberate approach.

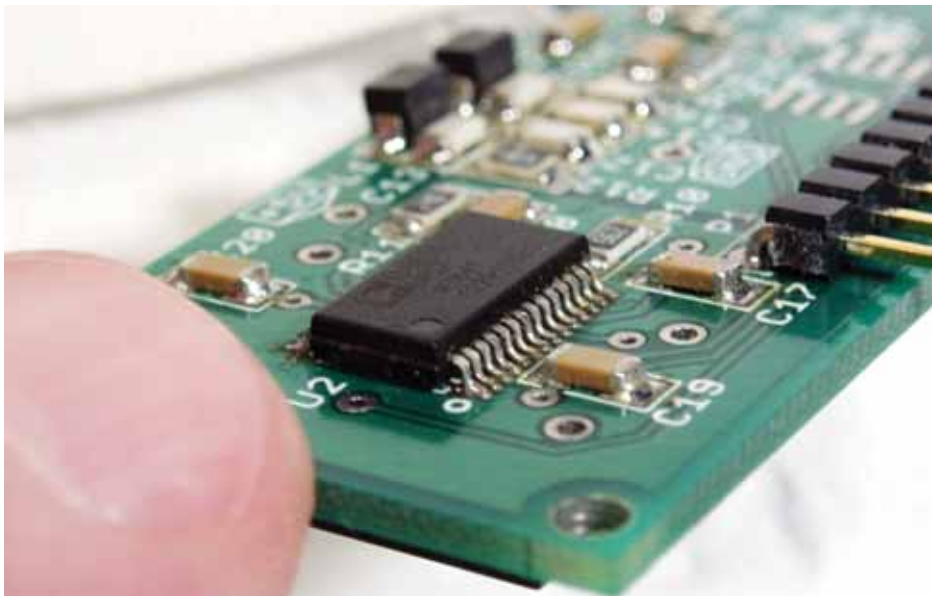

PHOTO 7: The result: a perfectly soldered DDS-60 board – even the difficult IC.

After a few experiments, I devised a procedure that gave a perfect result. Essentially it involved tinning and fluxing the contacting surfaces, holding the component firmly and precisely in place, and making the joint without adding any more solder to it. The procedure is:

1: Tin the mating surfaces. To hold the chip still for this, cut a tight fitting rectangular slot in a piece of thick card and invert the chip into it, so the bottoms of the pins are exposed, as shown in **Photo 5**. Then Blu-Tack the card to the benchtop and apply flux thinly over the pins. Clean the iron tip carefully on the wet sponge, pick up a tiny amount of solder (certainly not enough to form a drop), then a brief touch on a fluxed pin tins it perfectly. Keep cleaning and wetting the tip, possibly for every pin. The flux is necessary because the cored solder is not applied directly to the surface: to get enough flux out of the cored solder, far too much of it would be needed. Examine the result carefully to avoid poor adhesion of the solder to the pins and redo any that need it. The PCB lands are probably already tinned. If not, tin them too. You may want to do this anyway, if you are not sure of the composition of the original tinning, to avoid a poor mixing of solders in the hidden joints under the pins.

2: The problem now is that the pins have a convex surface and the lands are raised, so pressing the chip in place makes the pins slip off the lands into the gaps between. I got round this by cutting and paring, with a craft knife, a piece of plastic to fit the chip like a tight spanner on a nut. Note the plastic is kept well away from the pins so it does not melt. I fluxed the tinned pins again and, using a lot of patience, Blu-Tack and cardboard packing I was able to position the chip precisely in place, gripped firmly by the plastic 'spanner'; **Photo 6**. Then it was simple to touch each pin with the iron, cleaned and wetted for thermal transfer, apply a slight pressure to get the solder into thermal contact – and 'ping', the solder flowed together and made a perfect joint between the underside of the pin and the land, with a trace of a fillet round the sides, and no sign of a bridged gap.

It took me nearly all day to sort out that one SSOP AD9851 IC. I am proud to show the result in **Photo 7**.

CONCLUSION. I readily admit that there will be equally successful other methods of soldering SMDs to a PCB – for instance, I have not tried to solder BGA components; I cannot afford an oven and I have never tried solder paste (it seems incredibly expensive) or a hot air gun. I hope this article will encourage you to have a go and experiment until you too find a technique that suits you.

ACKNOWLEDGEMENTS. I would like to thank all those on the rsgbtech forum who answered my question on the legality of using leaded solder and in particular Ian, GM3SEK who brought [4] to my attention.

WEBSEARCH

[1] www.national.com/ms/MO/MOUNTING_OF_SURFACE_MOUNT_COMPONENTS-MISC.pdf
[2] http://curiousinventor.com/guides/Surface_Mount_Soldering
[3] *RadCom*, September 2008, page 76 and October 2008, page 62
[4] http://ec.europa.eu/environment/waste/pdf/faq_weee.pdf - sections 1.14 and 1.15 are most relevant
[5] www.dklmetals.co.uk/PDF%20Files/Factorfiction.pdf
[6] Soft solders containing lead material safety data sheet www.toolbank.com/cossh/0695.PDF
[7] www.OKIMetcal_389/PDF/OKI_Lead-FreeFumeExtraction.pdf
[8] www.amqrp.org/kits/dds60

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  - 350 - 390MHz (Rx)
  - 470 - 520MHz (Rx)
- **Frequency Stability:** 5ppm
- **Operating Voltage:** DC 7.2 Volts
- **Memory Channels:** 128
- **Antenna:** Standard SMA Hi-Gain Rubber Type
- **Antenna Impedance:** 50 Ohms
- **Operation Modes:** Simplex or Semi-Duplex
- **Transmitter Power:** 0.5 / 5 Watts switchable
- **Max Deviation:** 5 / 2.5kHz
- **Current:** 1.6A (5 Watts)
- **Dimensions:** 115 x 55 x 31mm WHD

STOCKISTS

Moonraker	Bucks	01908 281705
Nevada	Hampshire	02392 313090
Shortwave Shop	Dorset	01202 490099
Waters & Stanton	Essex	01702 206835

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- **N type** connector (Part: 7395) **£9.95**

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Specification
- Diameter: 10.2mm
- Loss per 100m: 4.0dB @ 100MHz, 2.8 dB @ 50 MHz

Price: £2.65 per mtr, **£251.75** per 100m drum

Ecoflex 10 Connectors
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Aircell 5

Specification
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- Loss per 100m: 9.4dB @ 100MHz, 6.61dB @ 50MHz

Price: £1.35 per mtr, **£128.25** per 100m drum

Aircell 5 Connectors
- **PL259** connector (part: 7760) **£2.25**
- **N type** connector (part: 7700) **£3.95**
- **BNC type** connector (part: 7720) ...**£3.25**

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Specification
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- Loss per 100m: 6.28dB @ 100MHz, 4.52dB @ 50MHz

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Aircom Plus Connectors
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Taking part in the IOTA Contest

IT9EJW/P went on the air from Lachea island, EU-166

PHOTO 1: Lachea is one of three islands off the Aci Trezza coast.

FIRST CONTEST ACTIVATION. A group of nine operators were active as IT9EJW/P during the IOTA Contest from Lachea Island, EU-166, a very small isle in front of the wonderful coast of Aci Trezza, situated on the lower slopes of Mount Etna, between Catania and Taormina. It was the first time that this island, an enchanting place surrounded by the wonderful Faraglioni, high rocks emerging from the blue sea which, according to the Greek mythology, were thrown by Cyclop Polifemo towards Ulysses escaping from Sicily, was active during an IOTA Contest.

The island is a wildlife reserve and, usually, nothing is permitted; but the idea of taking part in the IOTA Contest from such a location was a challenge to our team leader Alfio, IT9EJW. He called together a new team, Giovanni, IT9GAC, Eugenio, IT9VKY, Eugenio, IW9BCW, Francesco, IT9JQY, Andrea, IW9HQP, Angelo IW9HLM, Davide IW9GUR, Andrea IT9RKR and me (Nuccio, IT9RYJ) and began to plan the DXpedition. The team were members from two different branches of the ARI, the IARU affiliated Italian Radio Amateur Association. All were operators with different levels of contest and activations experience, but all had the same passion for contesting and DXing.

Alfio had the hardest job, asking for the thousand of necessary authorisations from all the Government Agencies that manage the protected area and preparing the endless list of equipment that we would have to carry with us onto the island.

GETTING THERE. Particular care was given to the antenna setup. To reach the top of the island where a small sea museum was to be the site of operations, we had to climb up an endless stone ladder carrying all the equipment and with a temperature higher than 30°. So the decision was made to take part in the contest as a DXpedition with 100W only and single-element antennas.

Because the island is a wildlife reserve there was a whole list of things we could and couldn't do! We could not:

- damage, of course, anything on it, in any way;
- fasten ropes to trees or plants, or knock tie rods into the ground; to secure the antennas we therefore would have to use some cans filled with water from a well situated is in the middle of the island and, when we finished, we would have to put the water back into it!

We had to:

- install the antennas only onto the roof of the museum and along a small path going from it to the well, while all the other paths had to be left free for visitors and inspections;
- highlight all the ropes with a red and white tape;
- of course, leave the area, after operations, exactly as it was before.

In order to comply with all these limitations – and to restrict the load to a minimum – we decided to build all the antennas ourselves. We chose a horizontal dipole for 20, 15 and 10m, four monoband ground planes on fishing rods for 40, 20, 15 and 10m and two wire dipoles for 80 and 40m; the only commercial antenna was a UJX multiband trapped antenna for 40 to 10m.

The following months were full of meetings and discussions. To help communications between the various team members, Andrea, IW9HQP, our network and computer engineer, put a forum at our disposal. Meanwhile the list of things we had to bring with us became longer and longer.

TESTING IT OUT. The first real operations test, which also involved the setup of the computer network, was done in the IT9GAC's work site, during the WPX Contest. But Giovanni and Alfio were not satisfied and decided to perform a more severe test of antennas and radios setup in an environment very similar to the one on the island on some land close to Acireale. Under the rays of a very hot sun, we put up and tuned all the antennas and set up all the radios in the same way we would do a month later. It was a great idea because it also helped the members of the team to start to work together.

Sadly, a couple of days before the contest weekend, we heard that Angelo, IW9HLM would not be able to participate.

On Friday 23rd we assembled on the quay of the small harbour of Aci Trezza with all the equipment with us, waiting for the boat, courtesy of Cutgana, the University Agency that manages the area.

ARRIVAL AND SETUP. Everything got to the island undamaged and then it was time to face the effort of transporting all the things to the top of the island, under the hot sun of July and with a temperature, as expected, of 34°! To reduce the effort needed, we spread all the people along the ladder; in this way, everyone would have to cover only a small part of the entire trip – it was surely better to walk a few meters up and down many times than going up and down the entire ladder even only a couple of times! In an hour we managed to carry everything to the top of the island.

While Eugenio, IW9BCW turned on the power supply system, Francesco, IT9JQY and Andrea, IT9RKR prepared the shack with their two Icom IC-756 Pro III; setup was completed by Andrea, IW9HQP, who connected the three computers to the network. All was ready now, so all the operators could go back for a good rest, leaving only Andrea, IW9HQP and Eugenio, IW9BCW on the island for the night.

Saturday morning and we were all back again onto the island. While Eugenio, IT9VKY prepared the lunch, Giovanni, Alfio and I went through the details for operating each station.

ON THE AIR AT LAST. At 1200UTC operations started with our CW operator IT9EJW on 20m. He worked one QSO after another. We were fortunate as we had two great CW operators, Alfio, IT9EJW and Giovanni, IT9GAC and most of our QSOs were worked in this mode.

All operators worked with a high level of concentration, trying to do their best and the experienced coaches had to make very few

PHOTO 2: We were there! Our 80m antenna is in the background.

PHOTO 3: We couldn't put poles in the ground so we had to use water-filled cans.

changes during the contest. The running station made a good number of contacts and it was immediately clear that the hardest part was to work all the active multipliers; some

PHOTO 4: The operating position inside the museum building. L-R IT9JQY, IT9GAC and IT9RYJ.

SSB pile-ups were very hard to pass through!

During operations, we had the opportunity to introduce the amateur radio and contesting to a Scout group visiting the island. Later on a reporter of a local newspaper visited us and did some interviews of us and the President of the Sicilian ARI Committee, Santo IT9ICS, who along with the President of Catania ARI branch, Eleonora, IT9EGM, had come to visit us.

CLOSEDOWN. At 1159Z on Sunday 25th we worked our last contact and we were all tired but happy. Then it was time to break it all down and go back home. We took the necessary care to avoid damage to the island environment and made sure we left it exactly as it was before our arrival.

We are really grateful to:

- Alfio, IT9EJW, who had the great idea to form the Team and to take part to the Contest from EU-166, and Giovanni IT9GAC, who encouraged him;
- All Team members, who made it possible;
- Eugenio, IT9VKY, IT9RKR's wife Loredana and my wife Lidia, for the delicious food they prepared for us;
- All our supporters, Vincenzo, IT9EJP, Giuseppe, IT9ATQ, Filippo, IW9FRB, Dario, IT9ZZO, Liborio, IW9HMS, Giuseppe, IT9AET, Oscar, IT9ITT and all other friends who encouraged us;
- Angelo, IW9HLM; we are sorry you weren't with us, we're waiting for you next time;
- The President of Catania ARI Eleonora, IT9EGM, and the President of ARI Sicilian Commette Santo, IT9ICS, for visiting us;
- CUTGANA, for the possibility it gave us to operate from the Island, Managers Prof. Carlo Blanco, Prof. Emanuele Mollica, Dott. Emanuele Puglia and Mauro Contarino, for their great help and Marcello Milazzo, IW9HLI www.RogerK.net.

Alfio is working on the DVD, which will be soon be available. More information can be found on our web site www.it9ejw.it/lachea.

Competition

Win the M0CV0 HW-40HP reviewed by Peter Dodd

READ ALL ABOUT IT? In his August 2010 Antennas column, Peter Dodd reviewed the M0CV0 HW-40HP off-centre-fed dipole. This 66' (21.28m) wire aerial has a feed point 1/3 of the way along its length, rather than the traditional halfway point of dipoles and doublets. The practical upshot is that an aerial fed like this offers a good match on 40, 20 and 10m and may work on 15m in some circumstances. Many people find the 2/3 to 1/3 length ratios to be particularly convenient when putting the aerial up, meaning that the feed point can be situated somewhere more convenient than that of a symmetrical dipole.

The weatherproof feed box contains a balun and makes it very easy to connect a coaxial feeder to its SO239 socket. In use, G3LDO found that he could feed the antenna on 40, 20 and 10m without an ATU. He made contacts in Europe and the eastern USA without any difficulty, even though the antenna was no more than 10m off the ground at its highest point.

You can find full information on the HW-40HP and other antennas in the range at www.m0cvoantennas.co.uk.

THE COMPETITION. Thanks to the generosity of the manufacturer Nigel, M0CV0, we can now give away the review antenna in our easy-to-enter competition. All you have to do is answer the following three questions:

1 **Which of the following bands is the M0CV0 HW-40HP not intended to work on?**
a) 40m
b) 10m
c) 23cm

2 **How long is the M0CV0 HW-40HP?**
a) 20.0m precisely
b) the same as a 21.28m piece of string
c) 165 feet, 3 inches

3 **What sort of plug should you use to connect your coax feeder to the balun box?**
a) 13A mains
b) phono (RCA)
c) PL259

HOW TO ENTER. The competition is open to all RSGB Members who are current on 1 November 2010. No Member may enter more than once.

Write your answers (eg 1-A, 2-A, 3-A), name, address and callsign on a postcard or the back of a sealed-down envelope (do *not* enclose any correspondence – envelopes will *not* be opened).

Send your entry to:
RadCom M0CV0 competition
RSGB, 3 Abbey Court
Fraser Road
Bedford
MK44 3WH

The winner will be the first correct entry drawn 'from the hat' after noon on **Wednesday 1 December** and will be announced in the next available edition of *RadCom*. The Editor's decision is final and no correspondence will be entered into.

The M0CV0 HW-40HP that could become yours!

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NEW

The RSGB Amateur Radio Operating Manual - 7th Edition

Edited by Don Field, G3XTT and Steve Telenius-Lowe, 9M6DXX

Despite what many believe, amateur radio is a fast-moving hobby and the last five or six years in particular have seen numerous changes. The *RSGB Amateur Radio Operating Manual* provides the best practical guide to the hobby as it is today.

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With more than 25 new contributors, this Seventh Edition of the RSGB *Amateur Radio Operating Manual* has lots of brand new material, as well as significantly rewritten sections. No matter if you are new to the hobby, or an established amateur, everyone will find this book a mine of useful and practical information about all aspects of amateur radio operating.

Size 210x297mm, 224 pages, ISBN 9781-905086-00-8

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HAM WEEK UK 1-10 October 2010

National Hamfest

The event was enjoyed by a large number of visitors, some in the rain, others in glorious sunshine!

Volunteer helpers worked hard on set up day to make sure that everything was in place for the visitors on Friday and Saturday.

The new Kenwood TH-D72 has a built-in TNC, APRS and integrated GPS.

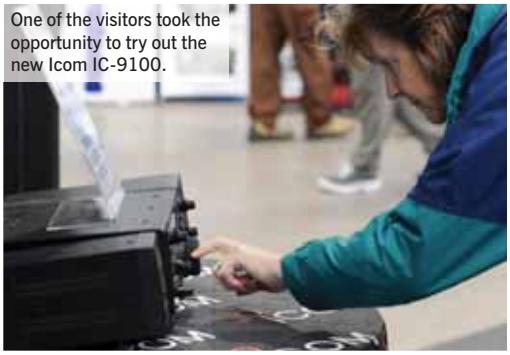
Martin Lynch from ML&S was pleased with the sales of Wouxun radios over the two day show.


The outside car boot area had bargains galore for visitors.


The first few visitors on Saturday morning went to the RSGB Bookstall to check out the special offers available.

RSGB President Dave Wilson, G0OBW was delighted to welcome Bob Inderbitzen, NQ1R from the ARRL.


Visitors took advantage of the sunshine to wander around the car boot area.


One of the visitors took the opportunity to try out the new Icom IC-9100.


Jeff Stanton discusses with a customer just what piece of equipment would suit best.


Practical Wireless editor Rob Mannion, G3XFD had a continual stream of readers stopping by to have a chat.


GB10NH operators Peter, M0EJL and Simon M0SIY, who were also helped by Bob, G3VRD.


The RSGB launched the amateur radio survey at the show. Members and non-members alike took the opportunity to take part.

The Yaesu FT-DX5000 attracted plenty of attention.

Photos by rkwphoto.com, Alastair, M0TEF and RSGB.

Icom IC-V80E and IC-T70E FM handhelds

Rugged single and dual-band radios with good performance

PHOTO 1: Left, the dual-band IC-T70E; right, the 2m IC-V80E.

INTRODUCTION. The latest pair of FM transceivers from the Icom stable (**Photo 1**) are robustly made, sturdy handhelds that will fare well in adverse conditions and look as if they will be able to withstand plenty of knocks over their life.

The IC-V80E is a 2m-only transceiver, while the IC-T70E is a dual bander covering 2m and 70cm. In both cases the transmit and receive frequency ranges are limited to the amateur bands, 144-146MHz for 2m and 430-440MHz for 70cm, although I understand some retailers are offering versions with extended receive frequency ranges as standard.

WHAT'S IN THE BOX. Both radios come with a BP-264 7.2V/1400mAH Ni-MH battery pack, BD4120 linear plugtop charger, a belt clip, suitable flexible aerial, a wrist strap and a manual. The IC-V80E also has a drop-in battery charger and a water-resistant cover for the speaker/mic socket that secures with two small screws.

FIRST IMPRESSIONS. The two radios are of a similar size and weight. The IC-T70E was about 389g with aerial, battery & belt clip; the IC-V80E was 365g. They feel very solidly constructed. Both have the now-standard multifunction keyboard with a small numeric keypad. The IC-V80E has most of its keys labelled with their secondary functions, making its operation reasonably intuitive, but the dual band IC-T70E has very limited labelling of the keys. A less intuitive menu system has to be navigated to make use of all the radio's facilities.

READ THE MANUAL FIRST! Just switching on and trying to use the VHF-only set without reading the manual was not too complicated to master, once it was realised that frequency had to be either typed in numerically or changed using the up/down arrow keys. Tuning was not possible using the rotary control. By default, the single knob on the top of the set adjusts only the volume. I had to consult the manual to find out how to adjust the squelch setting. This turned out to be a two handed operation, involving holding down the 'Moni' key while pressing the up or down buttons to adjust the setting.

The IC-T70E has a dual concentric knob. I found that the knobs tended to 'drag' on one another: operating one also made the other control rotate, leading to unexpected results such as inadvertently changing channel while adjusting the volume. The outer ring defaults to volume control and the inner part to changing the frequency in the programmed steps. But finding out how to operate the squelch was more complicated. Holding the 'Moni' button and rotating the small knob does adjust the setting – but the display does not show a number from 0-9 as we might expect. Instead, it shows 'Open', 'Auto' then a set of labels from 'Leve1' to 'Level9' – which was a little disconcerting. Of course, If I'd bothered to read the manual first…

All the other IC-T70E functions like repeater duplex offset, tone burst operation, CTCSS or 1750Hz, channel scanning etc that we have come to expect from handheld radios are all available by drilling down into the menu. Whilst users with previous experience of such menu selection may be able to navigate quickly, it really is more effective to just sit down and read the manual from end to end first.

TUNING AND SETTING. Both radios can be set for tuning steps in a range of values from 5 to 50kHz; for users within Europe there is probably little need for any other than the standard 12.5kHz channel spacing. Frequency can be entered manually on the keypad. If an invalid frequency is requested (ie one that would not end up on a multiple of the desired channel spacing), the last key press is rejected with a subtle bleep. As already mentioned, the up/down tuning buttons on the IC-V80E or the rotary control on the IC-T70E are an alternative means to set the operating frequency.

On each radio, duplex operation for repeaters is selected via a dedicated button. The frequency shift and direction it moves when going from Rx to Tx can be selected from the menu. The UK variant of the radios, as supplied, had the correct shifts and direction installed. If a frequency shift would result in operation out of band, the transmitter is disabled and 'OFF' appears in the display when you press the PTT.

The IC-V80E has a FUNC key that has to be pressed first to access the well-labelled function keys and accessing most of its functions is reasonably intuitive. But the display, which shows which level of most functions has been selected, does require good eyesight – for example the + and - signs for repeater shift are tiny symbols, such that anyone who needs reading glasses will certainly have to be wearing them to see these at all. Only the number of MHz plus two decimal digits are displayed in normal size (~7mm); the final two digits (25, 50, 75) are in really tiny text barely a millimetre high (see **Photo 2**).

TABLE 1: Power outputs of the ICOM IC-V80E and IC-T70E transceivers.

Power output, IC-V80E	High	Medium	Low
Battery fully charged, 145MHz	6.1W	2.8W	0.52W
Power output, IC-T70E	**High**	**Medium**	**Low**
Battery fully charged, 145MHz	5.5W	2.9W	0.61W
External 13.8V supply, 145MHz	5.6W	2.9W	0.61W
Current from external supply, 145MHz	1.7A	1.25A	0.61A
Battery fully charged, 435MHz	5.3W	2.8W	0.88W
External 13.8V supply, 435MHz	5.4W	2.8W	0.58W
Current from external supply, 435MHz	1.8A	1.35A	0.69A

The dual band IC-T70E's frequency display is clear and easy to read, with the final '5' for 12.5kHz channels about a third of the height of the main digits. Both displays are backlit with a pleasant green colour that is bright enough to be useful in dimly-lit conditions. Neither keypad is backlit.

The IC-T70E does not have a separate function key; the settings available on dedicated keys (which are labelled in purple) can be accessed by holding down the button for a couple of seconds. After I'd worked this out, I realised this is a very much nicer scheme than having to try to press two fiddly buttons either simultaneously or in sequence, while trying to read tiny display symbols.

On both radios the functions of the rotary knob can be reallocated, so that it can be used for tuning on the IC-V80E if desired, but in that event the up/down arrows have to be used for volume setting.

POWER, BATTERIES AND AUDIO INTERFACING.

Each radio has three selectable output power settings, High, Medium, and Low. The power settings are quickly selected by a dedicated key. **Table 1** shows the power outputs and, in the case of the IC-T70E, current consumption.

Charging the IC-T70E is accomplished by attaching the power adapter to the DC power socket on the side of the radio. The radio can also be run from a suitable power source of 10-15V DC plugged into this socket. The socket is capped with a rubber lid when not in use. The IC-V80E 2m radio has no DC socket and must be charged using the supplied drop-in charge cradle. The radio cannot be run from an external DC supply. The charger supplied with the radios is a slow-charge unit that takes 10 – 14 hours for a full charge of flat batteries. A high- speed drop-in charger is available as an option for either radio, as is a higher capacity Li-Ion battery pack.

Audio output from the internal speaker on each radio is surprisingly loud at high volume settings. The specification states that a bridge balanced audio amplifier is used, enabling well over half a watt of audio from the internal batteries. Practice seems to bear this out. An external speaker can be plugged into the earphone socket; here, the full benefit of the audio power level is achieved for use in noisy environments like off road vehicles or contest wagons. In fact, the audio 'punch' was of a quality at a high volume setting that I've only ever heard before from professional handhelds, never from any amateur rig.

An external microphone can be plugged in. On both radios this enables the option of an automatic voice operated transmit (VOX) function that saves the need to operate the PTT switch. This is something of particular value for mobile or portable operation when used with a clip-on lapel microphone.

TABLE 2: Receiver sensitivity.

Receive sensitivity, 1kHz audio tone, 2.5kHz peak FM deviation	IC-V80E 144 – 146MHz	IC-T70E 144 – 146MHz	IC-T70E 430-440MHz
Almost fully quieting (slight noise)	-118dBm	-122dBm	-124dBm
Uncomfortable noise, but audio copiable	-121dBm	-125dBm	-126dBm
Just opening squelch at lowest setting	-124dBm	-128dBm	-127dBm

PHOTO 2: The last two digits on the IC-V80E display (shown here life size) are rather small.

PHOTO 3: An inexpensive SMA-BNC adapter can be used with the IC-T80E for convenient BNC connection to the cable of an external antenna.

ANTENNA AND CONNECTORS.

Both radios were supplied with rubber duck style flexible antennas. The VHF-only transceiver has a standard BNC socket, but the IC-T70E instead comes with the smaller SMA type socket. Its associated antenna has the other mating half, the SMA plug, completely surrounded in rubber so that when it is fully screwed down, a waterproof seal results. The BNC connector is not inherently waterproofed in the same way.

If you want to use the IC-T80E with an external antenna, a SMA to BNC adapter such as the one at the lower left of **Photo 3** will be required. Looking around rallies recently, I see that SMA adapters to most connector types – even SO239 – are now available. There was a time once when SMA connectors and adapters were the sole preserve of microwaves and priced accordingly. Now they seem to be used everywhere.

ON THE AIR.

Handhelds like these come into their own when used as part of local communications links for big events. The two units reviewed were handed around for use during setting up for VHF NFD and, a few weeks later, for marshalling at the Flight Refuelling Hamfest. The trouble is, the only comments that came back were along the lines of, "it made a noise", "we talked on it", "they worked". That wasn't at all helpful for this review, but it is a testament that they did the job needed – and well. At least they survived being carried around, sat upon, and possibly even dropped, but no-one gave any details about that, either!

Receive audio quality was commented upon as being satisfactory. A few calls were made on simplex and via a local repeater with no surprises. Receiver sensitivity was measured and is shown in **Table 2**.

On standby, while continuously monitoring the infrequently used GB3PC 2m repeater, the battery life appeared to go on forever. In actual fact, at least three days of continuous monitoring were achieved before the batteries were so exhausted that the radios refused to transmit. This is thanks in part to the automatic battery-save function, which can be adjusted or switched off according to taste.

MEMORIES AND SCANNING.

Both radios support memory channels with the usual facilities such as priority, scan and skip modes. The VHF IC-V80E has over 200 memory channels, including 3 pairs of scan edge channels and a call channel. On the dual band IC-T70E you'll find some 300 memory channels, including 2 call channels and 25 pairs of scan edge memory channels. The IC-T70E also supports 26 memory banks, A to Z, and up to 100 memories can be assigned to a bank. In both cases, pretty much everything goes into a memory, including frequency, DTMF/CTCSS and even Tx power, to name but a few items. Extensive programming is probably most easily accomplished using the optional PC software and programming cable, although once one radio is programmed it can be 'cloned' to another of the same type using an optional cable.

CONCLUSIONS.

These two latest Icom handhelds are well made, strong and robust little sets that should endure well and survive rough handling; they clearly show their heritage from Icom's professional products like their marine radios All the functions needed for day-to-day simplex or repeater operations are available though a multi-function keypad and menu.

On the downside, though, both really need the manual on hand until you become really familiar with all their menu options. For straightforward simplex operation, they are mostly intuitive, but for anything more – read the manual!

We would like to thank Icom UK for the loan of the IC-V80E and IC-T70E.

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DC-2 Standard 2-pin/15A fits most VHF/UHF .... £10.00 P&P £3
DC-3 Fits Yaesu FT-7800/8800/8900, etc ..... £17.50 P&P £3

YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round) .....£39.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) .....£34.99 P&P £5
MH-31A8J 8 pin modular .....£34.99 P&P £5

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True military spec real UK coax

RG-58 Military spec x 100m.
£49.99 or 2 for £90.00
Coax stripping tool (for RG-58).....£4.99

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Q-TEK TRI-MAGMOUNT

Very heavy duty. Available:- SO-259 or 3/8 – specify. **£44.99**

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box
WOW **£309.99** or £349.99 with 25m cable/plugs
G-650C extra heavy duty rotator. £355 or £399.99 with cable
G-1000DXC extra heavy duty rotator. £425 or £479.99 with cable
G-2800DXC The goliath of rotators £845.99
GS-065 thrust bearing £54.99
GC-038 lower mast clamps £32.99

AR788

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable £1 per mtr.
OUR PRICE **£81.99**
AE-201 thrust bearing £24.99

DIAMOND YAGIS

No tuning required

2m/10 element No tuning required SO-239 feed..... £74.99
70cms/10 element No tuning required SO-239 feed..... £48.99

Q-TEK COLLINEARS (VHF/UHF)

Del £12.50

X-30 GF 144/70, 3/6dB (1.1m)..... £44.99
X-50 GF 144/70, 4.5/7.2dB (1.7m)..... £59.99
X-300 GF 144/70,6.5/9dB (3m)..... £79.99
X-510H GF 144/70, 8.5/11dB (5.4m) £139.99
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)....£89.99

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MX-2000 50/144/430MHz Triplexer £59.99
TSA-6011 144/430/1200MHz Triplexer £59.99
MX-72 144/430MHz £34.99
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MX-62M (1.8-56MHz + 76-470MHz) £59.99

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Del £10.00

DB-7900 2m/70cm (5.5/7.2dB) 1.6m (PL-259)..... £39.99
DB-770M 2m/70cm (3.5/5.5dB) 1m (PL-259)..... £24.99
Diamond HV-7CX 7/14/21/28/50/144/430 ..... £129.99
Diamond CR-8900 10/6/2m/70cm (1.26m) £99.99
Diamond AZ-506 2m/70cm – only 0.67m long..... £39.99
PL-62M 6m/2m (1.4m) PL-259 ..... £23.99
PL-627 6m/2m/70cm (1.7m) PL-259..... £44.99

SPEAKER MIC

U-120 Fits Alinco, Icom and Yaesu. (Kenwood version available)
£16.99 P&P £4.00

EARPIECE/BOOM MIC

Over ear earpiece + boom mic. Available in Kenwood version or Yaesu/Alinco/Icom.
£24.99 P&P £4.00

ALUMINIUM POLES

20 foot (collection only) 2"..... £69.99
10 foot (collection only) 2"..... £34.99
2.4m (2") Ally pole..... £32.99
SPECIAL OFFER 2.4m x 2" poles (4 off)..... £100.00
5 foot x 2" pole..... £17.99

COPPER ANTENNA WIRE ETC

Hard drawn (50m roll)..... £40.00 P&P £7.50
New: 50m roll, stranded antenna wire..... £19.99 P&P £7.50
Flexweave (H/duty 50 mtrs) ..... £44.99 P&P £7.50
Flexweave H/duty (18 mtrs) ..... £21.99 P&P £7.50
Flexweave (PVC coated 18 mtrs) ..... £24.99 P&P £7.50
Flexweave (PVC coated 50 mtrs) ..... £59.99 P&P £7.50
Special 200mtr roll PVC coated flexweave..... £180.00 P&P £10.00
Copper plated earth rod (4ft) ..... £14.99 P&P £8.00
Copper plated earth rod (4ft) + earth wire..... £24.99 P&P £8.00
New RF grounding wire (10m pack) PVC coated ..... £14.99 P&P £5

METALWORK & BITS (Del Phone)

2" mast-floor base plate..... £14.99
6" stand off brackets (no U-bolts)..... £8.99
9" stand off brackets (no U-bolts)..... £10.99
12" T & K brackets (pair) £18.99
18" T & K brackets (pair) £22.99
24" T & K brackets (pair) £26.99
All bracket measurements are from wall to end of bracket
U-bolts (1.5" or 2") each..... £1.50
8mm screw bolt wall fixings £1.70
8-nut universal clamp (2" to 2")..... £7.99
2" extra long U-bolt/clamp £6.99
2" crossover plate with U-bolts £14.99
15" long (2") sleeve joiner (1.5" also available)..... £18.99
3-way guy ring £5.99
4-way guy ring £6.99
Heavy duty guy kit (wire clamp, etc.) £49.99
Set of 3 heavy duty fixing spikes (~0.7m long)..... £29.99
30m pack (4.4m) 480kg B/F nylon guy £12.50
Roll of self-amalgamating tape 25mm x 10mtr..... £8.99
Special offer:- Self-amalgamating 3 rolls..... £20.00

RH-9000 BNC

40cm flexible whip for the ultimate in gain. **£29.99** P&P £5.00
Tx:- 2m + 70cm (Rx:- 25MHz-2.9GHz).

RH-9090 SMA

40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm.
Rx:- 25MHz-2.9GHz **£34.99** P&P £5.00

QS-300

A fully adjustable deluxe desktop stand for hand-helds. Includes BNC to SO-239 lead. **£19.99** P&P £4

QS-200

A superb, no mess, quick fit in-car holder (fits airvent) for hand-helds. **£6.99** P&P £3

Book review

Did Glenn Miller really crash into the Channel or was he secretly executed in Bedfordshire?

ARRL Handbook 2011

Many years ago I worked for a company whose managing director was an amateur. He came back from Dayton once with an *ARRL Handbook* that he subsequently lent to me. It was through that book that I really started discovering amateur radio, and I remain forever grateful. At well over 1400 pages, the *ARRL Handbook 2011* is surely the biggest, most authoritative versi on to date. Now in its 88th edition, it has once again been revised to reflect the latest thinking and practice in amateur radio.

The latest edition contains much new material of interest to the amateur, some of which is quite topical. There's a section on using computers to help design your circuits and boards using schematic capture and PCB layout software. Remote station design is described in detail, explaining how you can set up your equipment in a better location and yet still work from the comfort of your own home. There's even a new chapter that sheds light on restoring vintage equipment – very useful if you plan to obtain any of the surplus items from the RSGB Museum! Some sections have been significantly expanded, too, such as the information on RF interference, power line noise and even noise problems from (and in) cars.

As usual, there is a comprehensive mixture of theory and practice, hints and projects. In addition to the time-honoured 'meaty' power amplifiers there are new ideas such as a microprocessor-based SWR monitor meter.

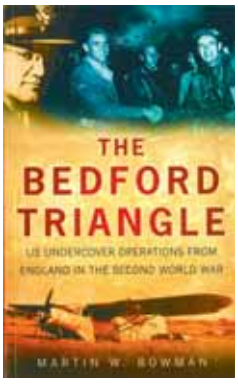
Whether it's propagation, antennas, basic electronics, understanding operating modes, technical aspects like mixers and filters, EMI, software defined radio, space communications, test equipment or troubleshooting, *ARRL Handbook 2011* has it all. At nearly three kilograms this is a weighty tome indeed, but as is increasingly the case these days it's supplemented by a CD-ROM. The disc contains the whole book electronically as a searchable pdf file, supplemented by lots of useful goodies such as PCB templates, layouts, software and much more.

Strongly practical yet backed up with good solid theory and how-to articles, I have no hesitation in recommending *The ARRL Handbook 2011* as an excellent and informative purchase that will stand you in good stead for years to come.

ISBN 978-0-98259-096-0
1416 pages, 208 x 276mm
Published by ARRL
Non members' price £37.99
Members' price £32.29

The Bedford Triangle

by Martin W Bowman



During the Second World War the area bounded by Harrington, Bletchley and Tempsford contained ultra-secret airfields, spy training establishments, skulduggery and shenanigans. Bedford was also home to radio and movie stars of the day, the BBC having decamped secretly from London and re-established operations there. 'Black' and 'grey' propaganda transmitters also abounded in the area, beaming a mix of popular music programmes and disinformation straight to Germany.

Glenn Miller came to England with his band, providing many live performances and broadcasts. But this came to an end in December 1944 when he disappeared. Officially, his plane went down over the Channel, but The Bedford Triangle suggests (among other things) that he may have been involved in some kind of secret psychological warfare and ended up being executed in Bedfordshire. We will almost certainly never know the full truth.

There is much information about secret flights to drop agents into France and vivid descriptions of the training & preparation of an agent. I learned a lot about secret wartime operations in and around Bedfordshire from this compelling, thought-provoking book.

ISBN 978-0-7524-5098-8
256 pages, 197 x 124mm approx
Published by The History Press
Non-members' price £9.99
Members' price £7.49 (25% off)

The Heroines of SOE F Section

Squadron Leader Beryl E Escott

It is rare that I find myself deeply affected by a book that I review for *RadCom*, but the story of Britain's SOE F (Special Operations Executive – Female) Section during the Second World War pulls few punches. It's the biographies of the 40 women that were recruited as spies and sent to occupied France, describing their (sometimes brief) training, wartime experiences, achievements and – in some cases – what they did after the War. ▸▸

Stealth Antennas

By Steve Nichols, G0KYA

Stealth Antennas is a wonderfully practical book that deals with the real antenna problems that are faced by today's radio amateurs. With decent sized gardens becoming a rarity these days, even more radio amateurs are faced with the problem of how to build an effective system for HF. *Stealth Antennas* begins with an inspirational set of case studies that show how great success can be achieved with a wide variety of modest, stealthy antennas. Next up is a helpful look at the safety considerations for stealth antennas with particular reference to the proximity of RF and people and the more obvious tips on how to avoid TVI and other local interference issues.

The real practical work starts in the Stealth Antennas For The Loft chapter. Here the author provides many loft solutions from diploes to loops and each one is very well covered. All the examples provided relate to real antennas that are in use by amateurs and include comprehensive details of the construction techniques. The inclusion of so much detail makes the designs easy to adapt for different local situations. Although most of the designs were for HF through to 6m, the chapter also included help for 2m and 70cm operations.

External antennas were next up for attention and the author provides stacks of good installation tips including were to find materials and some interesting data on the effect of trees. Over the Roof external antennas get an entire chapter and include detailed discussion of the construction and operation of a wide range of antenna systems. Practical examples of external stealth antennas follows and this includes detailed descriptions of a number of antenna systems along with plenty of detail on the set-up, operation and effectiveness of the antennas.

If you need the ultimate in stealth antennas the aptly named Let's Get Really Stealthy chapter has a lot to offer. Here you will find all manner of ingenious antenna systems including carpet loops and foil antennas. Should you prefer to buy commercial antennas, these are also well covered with details of many popular systems.

One of the problems with stealth antennas mounted very close to or inside the house is interference with domestic equipment or vice versa. The subject is well covered with a thorough run through likely problems areas along with tips on locating the source and practical solutions to minimise the effects.

The final sections provide some excellent guidance on improving efficiency, which is paramount when operating with less than ideal antenna systems. There is also a handy glossary of terms and a reference to other publications with stealth antenna designs.

This book is a practical reference for all of us that live in the real world where we can only dream of using full size antennas. Most of the antennas are based on real working antennas and many are backed up with photographs and lots of detail on the vital setting-up and operation of the antenna.

ISBN 9781-9050-8666-5
208 pages, 174 x 240mm approx
Published by RSGB
Non-members' price £13.99
Members' price £11.89

▸▸ By no means all survived; several came to very unpleasant ends.

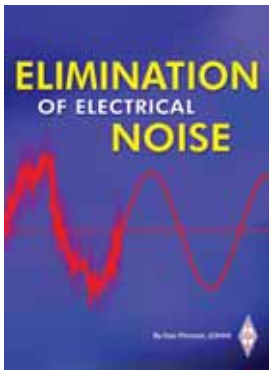
Near the middle of the book is a section of diverse photographs including agents, aircraft, technical equipment such as suitcase transceivers and listening stations. There are even concentration camp images including a solitary confinement cell and a crematorium.

The Heroines of SOE F Section paints a vivid picture of forty very courageous, bright and motivated women who risked everything for their country. It's definitely not easy reading, but is an honest work of sincere tribute. Perhaps the most fitting summary is the final few words: "… their work had counted, and all those who had died, had not died in vain."

ISBN 978-0-7524-5661-4
256 pages, 242 x 162mm approx
Published by The History Press
Non-members' price £18.99
Members' price £14.24 (25% off)

Elimination of Electrical Noise

By Don Pinnock, G3HVA



Electrical noise is the amateur's nightmare and is capable of crippling your ability to operate if left unchecked. In this new book from the *Radio Today* series, Don Pinnock, G3HVA takes a detailed look at the problems he faced and uses his extensive experience to show how he went about identifying, locating and dealing with the electrical noise problems.

The first section of the book covers all the basic terminology you need to know and includes types of noise, antenna feeders and details of the vital measurement units. This is followed by the excellent Sources of Noise section that logically steps through a huge range of noise sources. In addition to describing the noise created by each device, Bob details the expected coverage area and a suggested fix. To make this section easier to navigate, Bob has divided noise sources into four main categories that are then supplemented with separate entries looking at the energy and distribution of the different types of noise.

Chapter 3 delves into property selection and provides a useful run through all the considerations to apply when reviewing a potential property for amateur radio use. Whilst very few amateurs will have the opportunity to make this sort of choice, the information can be applied to your own property to help you better understand the strengths and weakness of your own location.

Next comes the vital section on dealing with noise that works its way through a host of common offenders with ideas on how to deal with them. If, as is often the case, you can't completely eradicate the noise then the following chapter takes a close look at a variety of antenna systems that are less susceptible to noise reception. The antenna reviews were supported with a host of measurements and there was enough information for the reader to be able adapt the results.

Noise from outside your property is also catered for and Don suggests using the Wellbrook loop as an excellent and compact HF direction finding tool. If all else fails, Don has included a review of many popular noise cancelling systems!

ISBN 9781-9050-8661-0
64 pages, 174 x 240mm approx
Published by Radio Today
Non-members' price £6.99
Members' price £5.94

Sport Radio

A new Super League and how to win with a limited setup

Geoff Plucknett, G4FKA, who wins HF events with wire antennas only. Photo: M1EBV.

ENTER THE SUPER LEAGUE. In contesting there is always a balance to be struck between attracting newcomers (by making things not too difficult) whilst sustaining the interest of experienced ops (by presenting them with a challenge). To this end, starting next month, the new RSGB Super League for clubs is being launched. Here's how it will work.

The Super League is a contest to find the 'AFS Contest Club of the Year' from those who enter some or all of the four RSGB Affiliated Society contests. It will reward societies who field teams operating both above and below 30MHz, the winning society being the one that has achieved consistently high places in all four events, without necessarily winning any one of them. The rules for the contributing contests are unchanged, which means that the teams representing each Affiliated Society need not be the same on HF, VHF and UHF.

No entry will be necessary, because entries will be made automatically by the Contest Committee. The results of the four AFS contests contributing to the Super League will be 144MHz AFS (December), CW AFS (January), SSB AFS (January) and 432MHZ AFS (February).

The position of the Team or Club listing for each Affiliated Society entering any of the four contributing contests will be normalised to produce Super League Points (SLPs), which will then be added together to produce an overall SLP score. The normalisation will be carried out according to the following formula, with the result rounded to the nearest integer:

SLP = (N+1-P)*1000/N

where N is total number of clubs in the results table and P is the position of the club in the results table.

For example, if there are 50 clubs entering the event (N=50), the club in first position (P=1) would receive 1000 SLPs, the club in 50th position (P=50) would receive 20 SLPs and the club in 26th position (P=26) would receive 500 SLPs.

The winner of the Super League will be the club with the highest total of SLPs at the end of the fourth contributing contest. The maximum possible SLP score (if a club won all four events) would be 4000. A running SLP total will be published on the Contest Committee web site after each event has been adjudicated and the winner of the Super League will receive an award as 'AFS Contest Club of the Year'. Certificates will also be presented to the Affiliated Societies achieving 2nd, 3rd, 4th and 5th positions in the Super League. Each team member contributing to these Society's scores will receive a certificate. A Certificate of Achievement will be awarded to any Society which enters all four of the AFS contests in the Super League, and where its score in each one is 500 SLPs or more, that is, where it appears in the top half of each AFS contest table.

The General Rules will not apply to the Super League, the decisions of the RSGB Contest Committee in relation to it shall be final, and should a club or individual be generous enough to offer a trophy to the winning club/society, the Contest Committee would very much like to hear from them.

THE SMART APPROACH. If you want to decorate your shack with certificates for winning contests, you could do a lot worse than to copy what Geoff Plucknett, G4FKA does. Geoff has no beam antennas, no linear amplifier and space only for modest wire antennas, yet he clicks up win after win in international contests. Here he tells us how.

"People enter contests for many reasons. Some aim to win or be high in the placings. Others see it as an opportunity to fill the log with many QSOs in a short period. Contests also provide an opportunity to fill band-mode slots with entities, islands or whatever multipliers are up for grabs. Many just wish to be part of the event, perhaps sending in a check-log to help the adjudication.

"A view often expressed by potential contesters is that they can't do well against the 'big boys' and as a consequence they don't participate. There is no doubt that many large stations exist; indeed a number have been specifically set up to lead the pack in 'multi-multi' or 'multi-2' events. However there are ways that the small station can do well. Probably the most important criterion in my experience is picking the section to enter. Entering a section where there will be lots of well appointed stations will not bring rewards in certificates or placings, but picking a section where you are working against others with similar set-ups can deliver surprising results.

"After a long period as a 'VHF and up' fan, my own experience of HF contesting started in 2000 and my small garden with its resident oak trees became a haven for halyards and wire antennas of various shapes and sizes. My attentions were drawn to HF events as a method for starting on the route to WAC, DXCC and other attractive wallpaper. At first I did daytime dabbles in SSB events, slowly adding CW to the skill-set (thanks to the 80m Club Championships for re-awakening that mode from its long sleep). Finally, data was added to the mix in 2005. As an added challenge I decided to stick to 100W and wire antennas (the wet string antenna farm) no higher than 10m in a garden only 13m x 13m.

"So the contests went on and the entities started clocking up until it became clear that some more dedicated efforts were required, particularly on the lower bands. As an example, in 2008 I decided to do CQWW CW single-band 80m low power (timely, as CQWW CW is this month), as it was the one band where I needed the 100 entities for 5-band DXCC. So up went an inverted V doublet and on I went. I rattled away through the night, worked quite a few new ones, sent in my log and thought no more about it. Then out came

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Nov 11	80m Club Sprint	2000-2130	SSB	3.5	SN + name
Nov 13	Club Calls	2000-2300	SSB	1.8	RS + SN + Club name
Nov 20/21	2nd 1.8MHz	2100-0100	CW	1.8	RST + SN + District code
Nov 24	80m Club Sprint	2000-2130	CW	3.5	SN + name

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Nov 2	144MHz UKAC	2000-2230	All	144	RS(T) + SN + Locator
Nov 6/7	Marconi CW	1400-1400	CW	144	RS(T) + SN + Locator
Nov 9	432MHz UKAC	2000-2230	All	432	RS(T) + SN + Locator
Nov 16	UHF UKAC	2000-2230	All	1.3/2.3	RS(T) + SN + Locator
Nov 23	50MHz UKAC	2000-2230	All	50	RS(T) + SN + Locator
Nov 30	70MHz UKAC	2000-2230	All	70	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Nov 13-14	WAE DX RTTY	0000-2359	RTTY	3.5-28	RST + SN
Nov 27-28	CQWW DX CW	0000-2359	CW	3.5-28	RST + Zone (UK=14)

Italics indicate that only provisional information was available.
For all the latest RSGB contest information and results, visit www.rsgbcc.org.

Tine Brajnik, S50A, speaking at the closing ceremony of WRTC 2010. Photo: G4BUO.

the results and I was amazed to be top G in the category.

"10m was another challenge through the long period of low sun-spot activity. Up went a dipole and in 2007/8/9 I worked what I could hear, sent in the logs and thought no more about that either. That's until the certificates started arriving for top low power G, three years on the run.

"This year has been very rewarding for other awards, with DXCC RTTY to complete the mode set, plus 5B WAC and 5B DXCC all finding their way onto the shack wall. So, dear contesters, don't be put off by the mega-stations with their towers, amps and beams. Think about what you want to achieve, pick a contest, section or mode where fewer might enter and you'll be amazed by the results. You will still work lots, have a great deal of fun, learn a bit more about propagation and when to expect each area of the world to appear, and you never know you may enjoy the pleasure of the postman delivering that certificate to your door."

Whilst not wishing to suggest that you can win a contest without demonstrating a degree of skill, it seems one of the most important things is to be clever in picking your entry category. In fact Geoff's mention of propagation is extremely timely, because I intend to discuss this topic further in the coming months.

THE NEXT WRTC. Amateur radio's equivalent of the Olympic Games, the World Radiosport Team Challenge takes place every four years, this year's having taken place in Russia. After studying and discussing thorough proposals to host WRTC 2014 by a team from the New England, USA and another from Bulgaria, Tine Brajnik, S50A, Chairman of the WRTC Sanctioning Committee announced that organisation of WRTC 2014 was granted to the American team. He went on to say, "All members of the Committee were convinced that either group would provide competent and trustworthy sponsorship and found making the decision to award the event very difficult". Both teams were thanked for their interest and for sharing their vision for WRTC and he encouraged the Bulgarian team to pursue its interest in future WRTC events and support WRTC 2014 with suggestions and ideas from the European perspective, adding, "We encourage all radiosport participants around the world to extend their congratulations and support to the organisers of WRTC 2014 – we'll see you there!"

THIS MONTH'S EVENTS. The first event of November is the SSB leg of the 80m Club Sprints on Thursday 11th. On Saturday 13 we have the annual Club Calls Contest on 160m. This event often sees clubs making a special effort to get new ops to take part under supervision, which I see as a good thing. Exchange a report, a serial number, and – if you are a member of an RSGB affiliated society – the full name of your club and the word 'member'. For those using a club's own callsign, say 'club station' instead of 'member'. Some clubs have very long names, so there's a list on the Contest Committee website at www.rsgbcc.org/hf/clubcalls.xls of over 100 approved abbreviations for club names to be given in submitted logs (you still need to give the full name during each QSO). Something important for the contest managers of clubs to do is ensure that all the members who partake give exactly the same club name, common examples of mistakes being 'Club' when someone belongs to a 'Society', or saying 'xxx Radio Club' when they actually belong to 'xxx Amateur Radio Club'. It is also not unknown for inexperienced operators to give inconsistent information between QSOs, but this can be easily overcome by giving everyone a cue card to place in a prominent place on their station while the contest is running. A log-keeping tip for participants is to key in 'M' for Member, 'CS' for Club Station and 'NC' for No Club while QSOs are taking place, and expand the abbreviations to the full words afterwards. On the following weekend the 2nd 1.8MHz Contest is a 4-hour event in which, as well as working lots of UK and European stations, it is not uncommon for Transatlantic QSOs to be made. The CW leg of the 80m Club Sprint on the 24th the final RSGB HF event of the month, indeed it is the final Club Sprint session of the year.

Moving to VHF, we start with the 2m session of the UKACs on the 2nd. The other UKACs take place on the 9th (70cm), 16th (1.3/2.3GHz), 23rd (6m) and – as it's a 5-Tuesday month – 4m on the 30th. The only other RSGB VHF event of November is the Marconi CW, which takes place on 6th/7th. Depending on the amount of time you can devote and whether you are a single operator fixed station or not, there are four categories to enter.

The first international event I'd like to highlight is the RTTY leg of the Worked All Europe (WAE) DX Contest. Unlike the CW leg (held in August) and SSB leg (held in September), in the RTTY leg everybody works everybody. Single op stations are limited to 36 hours out of 48. Morse enthusiasts get their slice of the action on the last weekend of the month, when the CW leg of CQWW takes place. Expect the CW segments of the HF contesting bands from 80m to 10m to be busy for the whole weekend - even the upper HF bands.

ARDF

ARDF World Championships

The RSGB team. Back L to R: Vlad, 2E0VLB, Evan, M0TJU, David, G6HGE, Steve, RS203106, Robert, G3ORI, David, M3WDD, front: Andrew, G4KWQ, Rod, G6AWO, Jillian, M6JIL, Bob, G3ORY, John, RS205838. Photo: Ken Harker, WM5R.

WORLD CHAMPIONSHIPS. The RSGB team returned from the 15th World ARDF Championships with two top ten individual places and four very respectable team results. Day 1 of competition saw RSGB 144MHz champion John Marriott, RS205838 put in a terrific performance to bag 6th place in the 2m race for the M60 class. This equalled the previous best individual performance by a Brit, set at the last World Championship in Korea in 2008 by David Williams, M3WDD running in the M40 class, also on 144MHz. John had stormed out of the start and headed straight for transmitter 3 and his split times show that he was in fifth place when he arrived there. Being on a high spot, his bearings for his two other transmitters were good and he then headed for transmitter 5. He was still in fifth place here and about 6 minutes behind the leaders who were all within a minute of each other. At his last transmitter he was neck and neck with Alexandr Kochergin, the principal of a PE college in Kazakhstan, but Alexandr pulled clear on the long run to the finish to leave John in sixth place.

In the team competition the M60s were 7th out of the 14 complete teams.

Meanwhile, the M40 team were packing superbly in their 3.5MHz race. Andrew, G4KWQ and Steve, RS203106 posted identical times while David, M3WDD was five minutes behind them. The team was 9th out of the 19 who achieved a qualifying result. Competition in M40 is fierce and if Andrew and Steve had managed to save just one 5 minute transmitter cycle each, then the team would have been fifth.

The Championships were hosted by the Croatian national society and were based in the northern coastal resort of Opatija. They attracted just under 400 competitors from 33 countries. Unlike most previous championships, the competitors were accommodated in seven or eight separate hotels. As a result they missed much of the social aspect of renewing acquaintances from previous events and making new friends, which is a feature when a single large resort style hotel in used. The competitions were held in the mountains north east of Opatija where there is a national park.

NEW RULES. The new rules were in operation for the first time and added two new classes (M70 and W60) to the event, as well as providing for the running of competitions on both frequency bands on both days. The siting referee did not, unfortunately, make the best use of the opportunities presented to him by the new rules to provide the most appropriate courses for the wide range of physical abilities of the competitors. Having a wide spaced set of five transmitters on both bands on both days of the competition was not the best choice possible. As a result the M70 class still had to find transmitters spaced a similar distance apart as the M21 class. It would have been better to have one closer spaced set of transmitters on each day to provide more appropriate courses for the older age groups.

DAY TWO. The weather changed for day 2 of the Championships. Instead of the glorious sunshine of day 1, competitors woke to torrential rain, which persisted all day. This did not just require fortitude and determination; it also dramatically altered the radio conditions, especially on 144MHz. A mountain area is problematic enough in dry conditions when the hills and mountains surrounding the competition area cause multiple reflections and multi-path propagation. In the wet, the trees provide additional reflections that makes direction finding seriously difficult. To judge the effects, one can look at the M40 race on 144MHz where only 21 of the 57 starters located all of their four transmitters and got to the finish inside the time limit of 150 minutes. In a normal race one would expect about 95% to do this.

Against this background Andrew, G4KWQ made it back inside the time limit with a full set of four transmitters to grab 11th place. Not bad for someone who started competitive ARDF less than a year ago. He was top scorer for the RSGB on this band.

On 3.5MHz things are not so difficult although the wet trees make a mockery of range estimation data obtained in dry conditions. Bob, G3ORY was able to do enough to bag a top ten place (10th) ahead of some very capable opposition.

Team wise we achieved exactly the same places that we had on day 1 with the M40s being 9th out of the 16 countries who managed to get a complete team home on 144MHz and the M60 team were again 7th out of 14, this time on 3.5MHz.

We were also represented in M21, M50 and W35. It was another first for the RSGB to have a lady competitor at the World Championships in Jillian, M6JIL. Full results and detailed analysis are best seen on the DARC website at www.darc.de/referate/ardf/contest/10091517/10091517.htm.

On the broader front, as usual, the event was dominated by the eastern European nations. There were however some notable performances from other nations. Sweden managed to produce a very capable M40 team who achieved a win on 144MHz and a bronze medal on 3.5MHz. In addition, Hakan Melin won a silver and a bronze medal in the individual races. There was also success for the German team whose ladies were the team winners in the W50 144MHz race and in the individual races, a silver for the M70 3.5MHz race and a bronze for M60 on 144MHz.

The USA had a silver in the W60 team on 3.5MHz and a bronze in the M50 individual also on 3.5MHz. Norway also had two individual bronze medals.

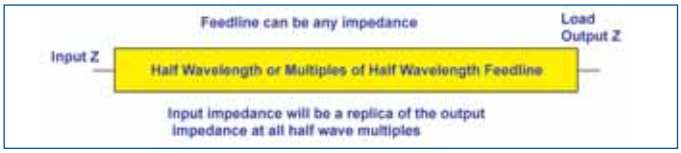
For the RSGB, John Marriott was 10 minutes off a podium place in the individual results and if our best M60 runners had managed to produce their best performances in the same race, our team result would have been very close to the top three.

Facts about Feed Lines

Seven useful things you might not know

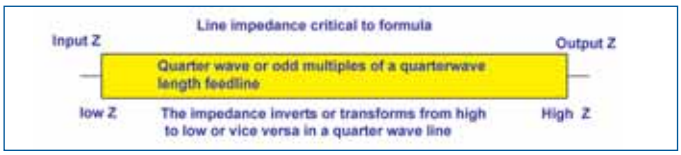
SIMPLE FACTS. In my time as an amateur, as well as my professional life, I've found there are a few fairly simple facts about feed lines that, when understood, shed a lot of light on what goes on in pieces of electric string. Here are seven simple facts – may they bring enlightenment.

FACT 1. Given any feed line, one half wavelength long, the voltage and current will be exactly the same phase at the load end of the line and at the source of the line. The same holds true at multiples of each half wavelength. Because of this, the impedance at the line's input end will be the same impedance as the load end.

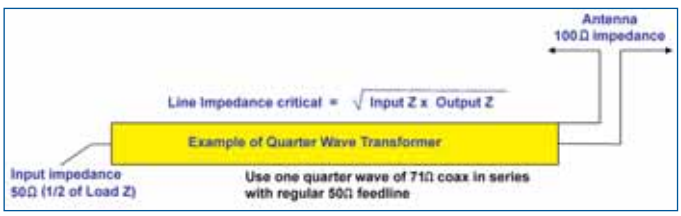


FACT 2. The input impedance of any feed line, no matter what its own impedance, will show the load impedance at all half wave multiples (Z load = Z input). A half wavelength of feed line will transfer the load impedance from one end to the other end of the line. Utilising this property is a great way to measure the actual impedance of an antenna at its operating height. Connect a half wave piece of coax or other transmission line (multiples of half waves if needed) and measure the input end. This is the actual impedance of your antenna.

FACT 3. In a quarter wave transmission line, or odd multiples of a quarter wave line, the voltage and current are out of phase at the end of the quarter wavelength. At the load end, if the voltage is maximum and current is minimum, the voltage is minimum and the current maximum at the input source. This relationship produces high impedance at one end and low impedance at the other. In so many words, we have a way of transforming the impedance from one end to the other of a piece of transmission line. It is a method to match impedances such as a 25Ω beam to a 50Ω coax.



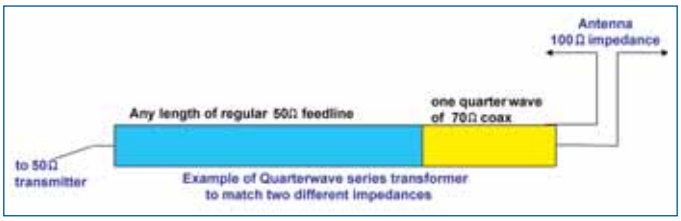
FACT 4. To utilise this concept to match two unequal impedances, multiply the two impedances on each end and take the square root. This becomes the necessary impedance of the quarter wave transformer. You will have to obtain (cut) a quarter wave piece of transmission line made to this impedance. If it's an odd number (not 50 or 75Ω) it can be creatively obtained by paralleling lines or other means.



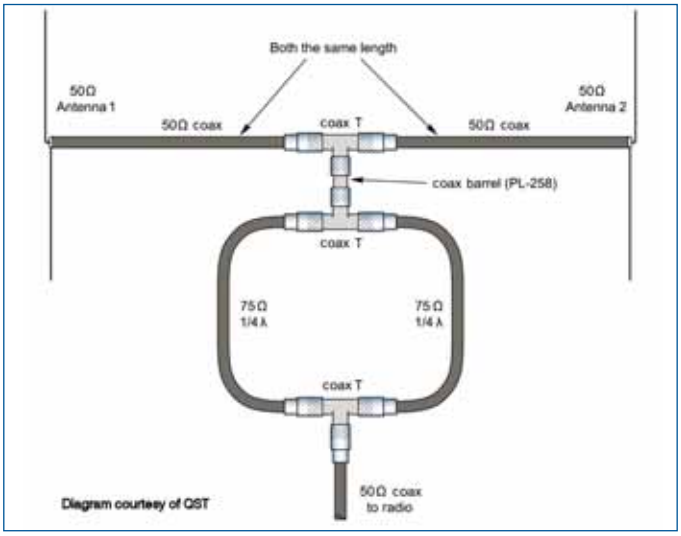
FACT 5. If we needed to match a 100Ω antenna to a 50Ω coax, a quarter wave piece of 70Ω coax in series with the regular line would do the job. Just insert the quarter wave piece before the antenna and you have a good match. (Note: a quarter wave transformer only works at one frequency. It is not a broadband device.) For frequencies above 14MHz the bandwidth is wide enough to operate over most of the ham band.

The formula to calculate the necessary impedance of the line is

$$Z_{cable} = \sqrt{\text{Input Z x Output Z}}$$
$$= \sqrt{50 \times 100}$$
$$= 70.7 \text{ (so use 75Ω cable)}$$



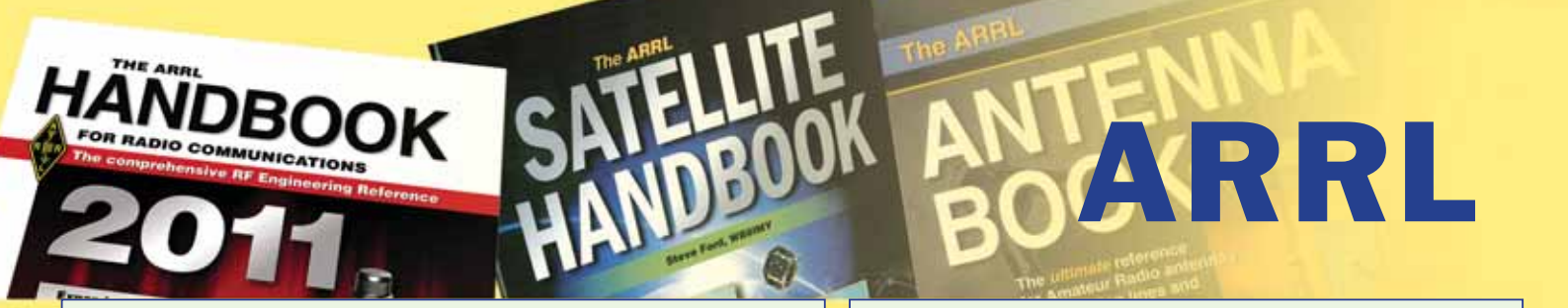
FACT 6. Parallel coaxes can be utilised to match a number of situations with a little creativity when the formula comes out to non-standard transmission line. This diagram shows how to make up a 35Ω quarter wave matching section, required to match the 25Ω of two paralleled 50Ω antennas to a 50Ω feedline.



FACT 7. Radio waves slow down in wire so that change in speed will make the length shorter. This slowing down is known as the velocity factor and is different for various types of cable. 50Ω coax generally has a velocity factor of 66%, so you multiply the physical wavelength by 0.66 to get the correct length. A typical 300Ω flat (ladder) line has a velocity factor of about 93%, RG-8 (non-foam) is 66% but foam-dielectric RG-8 is 82%. (This month's ATV includes a table that lists velocity factors for several other cable types).

Wavelength (metres) = 300 / frequency (MHz)
Half wavelength = 150 / frequency
Quarter wavelength = 75 / frequency

To make a quarter or half wave piece of transmission line, use the formulas to get the physical length and then multiply by the velocity factor for that type of line. Add about 10% as an error margin. Measure out this length and then, using a network analyser, dip meter or other indicator, cut small bits off until you reach the exact quarter or half wave length. (This month's Homebrew explains more about how to do this).



ARRL Pic Programming for Beginners

By Mark Spencer, WA8SME

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By Steve Ford, WB8IMY

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

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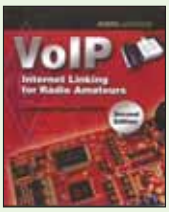

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By Jonathan Taylor, K1RFD

Large numbers of radio amateurs are now regularly using VoIP, or "Voice Over Internet Protocol" and *VoIP: Internet Linking for Radio Amateurs* is the complete guide to this fascinating topic.

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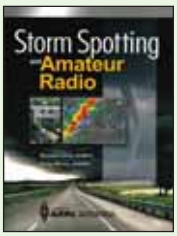

Storm Spotting for Radio Amateurs

By Michael Corey, W5MPC and Victor Morris, AH6WX

This book is aimed directly at those who interested in tornados and other severe weather phenomenon. Many amateur radio operators are trained storm spotters and this book includes information on resources, training and equipment available to them. The book starts with a straightforward introduction to the subject moving to practical safety information for this hazardous activity and details of what to expect. There are extensive guides to meteorology and hurricanes and storm spotter activation procedures. Thoroughly recommended reading for those interested in all severe weather, including hurricanes, tornadoes, hail, floods, damaging wind, and winter weather.

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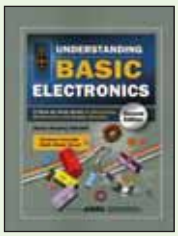

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By Walter Banzhaf, WB1ANE

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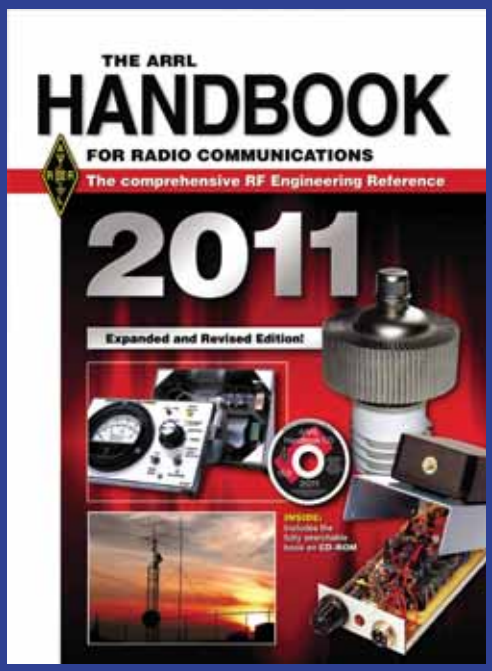
The ARRL Handbook 2011



At 1416 pages, the 88th edition of the *ARRL Handbook (2011)* is bigger than ever. Part reference and part applied theory and filled with practical treatments of basic electronic fundamentals, RF design, digital and software radio technology, antenna construction, *The ARRL Handbook* is a must have for every radio amateur.

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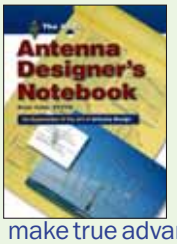

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By Brian Cake, KF2YN

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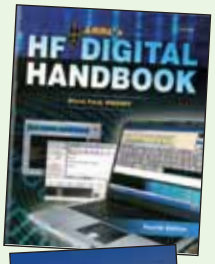

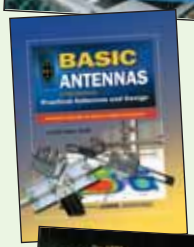

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HF F-Layer Propagation Predictions for November 2010

Compiled by Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe								
Moscow	884....27778	8373..478778	..7666785...	...88888....	...99996....	...8999.....	....887.....	....77.....
*** Asia								
Yakutsk	4453	6.3...367667	...66...5..4	...7........	.....	.....	.....	.....
Tokyo	.......3222.	...65377655.	...3........	.....	.....	.....	.....	.....
Singapore	.......1111.	687565	......55....	......63....	.....67.....	.....66.....	.....5.....	.....
Hyderabad	.....	24333	.......54...	......55....	......54....	......5.....	.....	.....
Tel Aviv	997.....8899	9792...89989	..44..376...	...76678....	...88886....	...6887.....	....88.....	.....
*** Oceania								
Wellington	.....	....66662...	....7776....	....6774....	.....64.....	.....	.....5.....	.....
Well (ZL) (LP)	.....	.....	.....	3.....	.....	.....	.....	.....
Perth	.....	......37644.	......785...	......77....	.....	.....	.....	.....
Sydney	.....	.....57753..	....3887....	....7885....	....464.....	.....4.....	.....	.....
Melbourne (LP)	.....	...97.......	.3.99.......	...994......	...796...4..	....9.......	.....	.....
Honolulu	.....	...2...4....	...55637....	.......4....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....	.....	.....	.....	.....
W. Samoa	.....	...57777....	...58887....	....7884....	....687.....	.....75.....	.....5.....	.....
*** Africa								
Mauritius	2........222	7......37767	5......77545	.......73...	......36....	......44....	.....	.....
Johanesburg	.....	53.......233	87.....28878	5.3....876..	.....	.....	......4.....	.....
Ibadan	.1..........	676.....3566	777.....5777	3.45...376..	...754566...	...77677....	...77777....	....7775....
Nairobi	2.........11	78......7777	5.......5455	..4....55...	...3..36....	...53356....	...7667.....	....577.....
Canary Isles	777.....2666	7787....7888	88684..68888	...7767747..	....9889....	....7777....	.....	.....
*** S. America								
Buenos Aires	.....	22.6........	54.9......33	...8........	...5........	....4.......	.....	.....
Rio de Janeiro	.....	3327.......2	55.9.....554	...8.....3..	...64.......	....5.......	....4.......	.....
Lima	.....	22.2........	33.5.......2	.....	.....	.....4.....	.....	.....
Caracas	.....	3334......13	75.86....365	....73..33..	....47666...	.....777....	.....777....	.....775....
*** N. America								
Guatemala	.....	22.4........	3..76.......	.....5......	.....54.....	......53....	......4.....	.....
New Orleans	3331........	76.72......6	4..7........	.....6......	.....	......4.....	......5.....	.....
Washington	4453.......3	77373.....67	53.44....533	.....6345...	.....5345...	......55....	......56....	.....
Quebec	6663......45	76.74....666	...57...35..	.....6567...	.....5454...	......55....	......6.....	.....
Anchorage	.33.........	66.52...3..4	4...74.47..2	........4...	.....	.....	.....	.....
Vancouver	.....	33.3........	.....	.....	.....	.....	.....	.....
San Francisco	.....	2..3........	.....	.....	.......3....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.......6....	.......6....	.......5....	.....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong. The RSGB Propagation Studies Committee provides propagation predictions on the internet at www.rsgb.org.uk/propagation/index.php. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for November, December and January 2011 are respectively (SIDC classical method – Waldmeier's standard) 23, 25 & 28 and (combined method) 49, 53 & 57. The provisional mean sunspot number for August was 19.6. The daily maximum / minimum numbers were 40 on 2 and 4 September and 0 on 8 and 9 September.

Getting listed here and on GB2RS is easy. E-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. The deadline for the October *RadCom* is 1 September and for the November edition it's 1 October. For GB2RS, the deadline is 10am on the Tuesday for the week of broadcast.

1 SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, GM0ONX@RSGB.ORG.UK

AYR ARG
Tom Ferguson, GM1OST, 01292 532 088
3 Computerised rotator control
17 GDO construction night

BORDERS ARS
Ray, GM0CDV, 01573 228730
12 PSK31 & SSTV, Landles, GM4XZZ

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
5 Normal club night
19 Talk on SDR, Bjorn Franke

KILMARNOCK & LOUDOUN ARC
Graham, MM3GDC, mm3gdc@btinternet.com
9, 23 Club night

LOTHIANS RS
Andy Sinclair, lrs_secretary@moosedata.com
10 GPO vans in the queerest of places, John Macdonald, GM4XZN
24 DXpedition to Antarctica (VP8), Gavin Taylor, GM0GAV

PAISLEY (YMCA) ARC
Bill Anderson, 2M0BZZ, 01505 613633, bill@3bis.co.uk
3, 17 Training
10 Simple rig repairs, GM3UWX

WEST OF SCOTLAND (GLASGOW) ARS
Fred Coombes, 2M0BIN, 01415715512, www.wosars.org.uk
3, 10, 17, 24 Construction projects & licence training by the Solder Group
5, 12, 19, 26 Presentations, guest speakers, raffle & quiz

2 SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, GM1BAN@RSGB.ORG.UK

ABERDEEN ARS
Lewis, GM4AJR, 01224 575 663, www.radioclubs.net/aars
4 Junk sale
11 Construction, OTA
18 Beginners' CW
25 AGM

3 NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, M1CNY@RSGB.ORG.UK

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
8 HF digimodes including APSK, Chris, G4HYG et al
22 Open evening & activity night

CHESTER & DARS
Barbara Green, 07957 870770, www.chesterdars.org.uk
2 Discussion on members' questionnaire, Burley Hall
16 Bring and tell at Burley Hall
23 Video on K3 construction or The Other Man's Shack, Burley Hall
30 Radio operations at Waverton Institute

MACCLESFIELD & DRS
Roger Bell, M0GMG, 0771 258 9163, gx4mws@gx4mws.com
1 OTA
8 VHF contesting introduction
15 Social night
22 Advanced exam
29 Film night

PRESTON ARS
Richard, M0RDZ, 07855873566, secretary@prestonars.co.uk
11 6/4m DX by Neil, G0JHC

WORKINGTON & DAR&IT GROUP
Barry Easdon G0RZI, 01946 812092
8 Monthly meet and OTA
22 Yagi antennas by Norman, G7MRL

4 NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, G0UGE, G0UGE@RSGB.ORG.UK

ANGEL OF THE NORTH ARC
Nancy Bone, G7UUR, 0191 477 0036, nancybone2001@yahoo.co.uk
1, 8, 22, 29 OTA, natter night
15 Stealth antenna systems by Chris Herring

EAST CLEVELAND ARC
Alistair, G4OLK, 01642 475 671, alistair.mackay@talk21.com
5, 19 OTA
12 Technical forum
26 Prepare stall for Spennymoor Rally

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240573, gmacnaughtwov@yahoo.co.uk
3 Radio hints and kinks, G3XYF
10 Sounds good (recording), G4YTV
11 80m Sprint - Home stations
13 Club Calls - Top Band - Home stations
17 Bring a mystery object evening
20 1.8MHz contest - CW
24 Club Night and 80m Sprint - CW

RIPON & DARS
Rob Hall, M0RBY, 0787 608 5631, www.ripon.org.uk
4, 11, 25 Club night, OTA
18 Talk – digital modes using Linux

SCARBOROUGH AMATEUR RADIO SOCIETY
Jerry Scarr G6LBL, 01751 476601, jerryscarr@googlemail.com
1 Amateur radio in the new millennium
8 DVD: Classic Manoeuvres: Red Arrows' 1983 American tour
15 Peculiar antennas, a talk by G0UVR
22 Edison Swan Trophy competition
29 Constructing the Elecraft K2 transceiver by G0WHO

SHEFFIELD ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
1 Design, use and misuse of linear amplifiers, G3PHO
8 Dip & loading tuning technique demo
15 Winter junk sale
22 Working from temporary locations at home and abroad by Nevil, G3VDV

5 WEST MIDLANDS

REGIONAL REP: TREVOR BAILEY, M0KMB, M0KMB@RSGB.ORG.UK

BROMSGROVE & DARC
Chris, M0BQE, 01905 776 869, M0BQE@hotmail.com
5 Filters, design and construction
12 Try your rig on the club's antenna
19 Committee and HF OTA
26 E-QSL demo and explanation

CHELTENHAM ARA
Derek Thom, G3NKS, 01242 241099, chairman@caranet.co.uk
18 Radio Winchcombe by P Arkell

COVENTRY ARS
John, G8SEQ, 07958 777363
5 Bangers & mash
12 Great egg race
19 Skittles night
26 Committee forum

GLOUCESTER AR&ES
Anne, 2E1GKY, 01452 548478, daytime, www.g4aym.org.uk
1 A lantern show by David Bailey
8 DF Hunt
15 HF/workshop
22, 29 Informal evening

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
3 OTA, training classes
10 Committee meeting, ragchew & training classes
17 Film show by Ron Swinbourne, M0WSN; training classes
24 Laptop computer evening, training classes

MID-WARWICKSHIRE ARS
Don, G4CYG, 019 2642 4465
9 Video / DVD evening
23 Meeting on the air - all welcome on 145.225MHz

SOUTH BIRMINGHAM RS
Don, 0121 458 1603, www.radioclubs.net/southbirmingham
1 Contest planning meeting
3 AGM, 8pm prompt in main hall
4, 11, 18, 25 Foundation training classes with G8OWL
5, 12, 19, 26 Construction evening
7 Visit to Martlesham microwave round table
8 Equipment dismantling evening for next rally
15 Committee meeting - welcome new members
22 OTA and ragchew
29 Aerial working party

STRATFORD UPON AVON DRS
G0CHO, 01608 664488, cousbey@theiet.org
8 Surplus equipment sale hosted by G8HJS
22 Video night

TELFORD & DARS
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@blueyonder.co.uk
3 Committee meeting; HF OTA
10 TDARS library - what we have, what do we need?
17 Surplus equipment sale, G8UGL
24 Quiz night, G8UGL

WYTHALL RADIO CLUB
Christopher Pettitt, G0EYO, g0eyo@blueyonder.co.uk
1, 8, 13, 15 Advanced Course
2 2m UKAC
9 Committee meeting
16 Homebrew
22 Advanced exam
23 OTA/natter night

6 NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, MW1MDH@RSGB.ORG.UK

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620733
1 APRS, Wynne Griffiths, MW0AQZ
15 AGM

WREXHAM ARS
Glyn, MW0BNB, www.wrexham-ars.co.uk
2 PSK31 demo, Bob, G6CVX & John, 2W0OSG
16 Quiz night

7 SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, MW0EQL@RSGB.ORG.UK

LLANELLI ARS
Craig, MW0MXT, 01269 840292, craig@mw0mxt.co.uk
1 OTA
8 Club raffle
15 DVD night
29 Junk sale and raffle

8 NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, MI5JYK@RSGB.ORG.UK

No entries received this month. Please send any information to GB2RS@RSGB.org.uk

9 LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, G8ROG@RSGB.ORG.UK

AYLESBURY VALE RS
Roger, G3MEH, 01442 826 651
10 Quiz at the Doghouse with Chesham club

BROMLEY & DARS
Andy, G4WGZ, 01689 878089
16 Construction contest

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
1 Project testing
15 Pamphonics - Jeremy

CHESHAM & DARS
Terry, G0VFW, 01442 831 491, cdars.club@ntlworld.com
3 General meeting, CW training session
10 Annual quiz with Aylesbury Club at Chesham WHC
17 Construction project evening
24 OTA

COULSDON ATS
Andy, G8JAC, g8jac@btinternet.com
8 D-Star, Chris, 2E0CTH

CRAY VALLEY RS
Bob, M0MCV, 020 8265 7735 after 8pm
4 Surplus equipment sale
18 IOTA video & natter night, Keith Bird, G4JED

DORKING & DRS
Garth, G3NPC, 01737 359472, www.ddrs.org.uk
23 Repairing vintage radios, David Smith, M0SXD

ECHELFORD ARS
John, G4GSC, 01784 451898
11 My whirlwind tour of Central America, Roger Western, G3SXW
25 Bring & buy, CW practice & natter night

EDGWARE & DRS
Mike, G4RNW, 020 8950 0658, michael.stewart5@ntlworld.com
11 Sundials, Julian, G4ZOD
25 The Blue Streak, Malcolm Wood

READING & DARC
Pete, G8FRC,
01189 695 697
11 23cm, Prof. Colin Bayliss, G3WKZ
25 Construction contest, Robin Caine, G4IWS

SHEFFORD & DARS
David, G8UOD,
01234 742 757,
www.sadars.co.uk
4 Voltage control on the National Grid, Don, G4LOO
11 Quiz night
18 Through the keyhole, a different view of members shacks
25 Paul Leighton

SOUTHGATE ARC
David Sharp, M0XDS,
david.sharp1@tesco.net
10 Autumn junk sale

SUTTON & CHEAM RS
John, G0BWV,
020 8644 9945,
info@scrs.org.uk
18 Building and using the TenTec 1330, Martin Butler, M1MRB

VERULAM ARC
Ralph, 01923 265572,
g1bsz@aol.com
1 Committee meeting
4 Informal social at the Queens Head, Sandridge
13 Club Calls contest
16 Lecture on air traffic control

WEY VALLEY ARG
www.weyvalleyarg.org.uk
5 Morse Frivolity, Andrew Vine, M0GJH
19 Construction contest

WIMBLEDON & DARS
Jim, M0CON, 020 8874 7456,
www.gx3wim.org.uk
12 Foundation Licence: discussion, Andrew, G4ADM
26 Surplus equipment sale

10 SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, G6DGK@RSGB.ORG.UK

ANDOVER RAC
Martin, M0MWS, 07776181646,
www.arac.co.uk
2 Club night and talk on propagation
16 Club night

BASINGSTOKE ARC
Clive, G4ODM, 01256 326050
1 Informal meeting
15 Antenna analysers, Peter DGQ

BREDE STEAM ARS
Steve, 01424 720815,
M0NUC@aol.com
6, 9, 16, 23, 30 At the shack

CRAWLEY ARC
John, G3VLH, 01342 714 402
24 Behind the scenes at Bletchley Park in WW2, Dr Brian Oakley

HARWELL ARS
Malcolm, G8NRP, 01235 524844,
info@g3pia.org.uk
9 Martin Ditter, European Space Agency
23 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909,
www.herc.uk.net
24 Mystery objects

HORNDEAN & DARC
Stuart, G0FYX, 023 9247 2846,
www.hdarc.co.uk
2 Natter night & social evening
23 Club members' 10-minute talks

HORSHAM ARC
www.harc.org.uk
4 Light bulbs, John Narborough
14 Sunday morning fox hunt
18 Social at The Foresters Arms, Horsham

SOUTHDOWN ARS
John, G3DQY, 01424 424 319
3 Operating at Hailsham shack
8 Annual dinner, Toby Carvery, Eastbourne

SWINDON & DARC
Den, M0ACM,
07810 317750, www.sdarc.net,
deryckg3ykc@btinternet.com
4 You are being tracked, James, M1DST
11 Natter night
18 Maritime mobile operation, Richard, G3ZGC
25 Natter night

TROWBRIDGE & DARC
Ian, G0GRI, 01225 864 698, E/W
3 Judging G2BQY & G4UNU Constructor's Cup
17 Natter night

WATERLOOVILLE ARC
Rich, G4IBW, 02392680852,
g4ibw1@ntlworld.com
26 CW night

WORTHING & DARC
Roy, G4GPX, 01903 753 893
3 Annual construction contest
10 Discussion evening
13 RSGB 160m Club Calls contest
17 Power & power measurement, Tony, G3NPF
24 GX3WOR OTA for 80m SSB Sprint contest

11 SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, G7SME@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473251
15 Bring & buy auction

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420442
29 An insight into the air interface of cellular phones, Matt Besant, G4RKY

CALLINGTON ARS
Chris Harris, G7UDX, 07973 418 371,
g7udx@me.com
3 Four Square antenna, Steve Pridham, G4BVB

NORTH BRISTOL ARC
Dick 01454 218362,
www.nbarc.org.uk
5 Mars – A new DVD from Paul, G8YMM
12 History of NBARC in pictures, John, G3IZM
19 Committee
26 Building the Brendon xcvr, Dick, G0XAY

SOUTH BRISTOL ARC
Len, G4RZY, 01275 834 282
4 Committee meeting
11 Start of Christmas raffle
18 AGM
25 OTA

TAUNTON & DARC
William, G3WNI, 01823 666 234,
g3wni@btinternet.com
10, 24 Operating club station
17 Club evening

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417048,
tonytsgarc@btinternet.com
3 Narrowband TV revisited
10, 24 OTA
17 Video night

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
5, 12, 19 Natter night
26 Visit by Peter Kirby, G0TWW, RSGB General Manager, speaking on Spectrum Defence. Non-members welcome.

WEST DEVON RC
Jules Cuddy, M1AGY, 01752 291588
2 Bring and Buy night, all welcome
16 Lifetime Member award night
30 Radio maintenance and repair talk, Jules Cuddy, M1AGY

YEOVIL ARC
Steve Crask, G7AHP,
steve@g7ahp.co.uk
4 RSGB talk, G0XAY
11 M1FFP from the shack
18 The Yeo RX, G3PCJ
25 Yeo Project evening & committee evening

12 EAST & EAST ANGLIA

REGIONAL REP: PHILLIP BROOKS, G4NZQ, G4NZQ@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404154,
secretary@bittern-dxers.org.uk
11 Informal club meeting
14, 28 Foundation course
25 Club meeting planning development and training events

BRAINTREE & DARS
John, M5AJB, 01787 460 947
1 Junk sale
15 Circuit theory, Ian Wager

CAMBRIDGE & DARC
Lawrence Micallef, M0LCM, 07941 972724, events@cdarc.co.uk
5 The Life and Adventures of Marconi, Peter, M0DCV
12 Morse for all abilities
19 Junk exchange
26 Shack evening / Repeater Group AGM

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008,
www.g0mwt.org.uk
2 SPR mode and 500kHz, 136kHz and 8.97kHz VLF operating, Roger Lapthorn, G3XBM
9, 16, 23, 30 Club net night
10 Committee meeting - Danbury

COLCHESTER RADIO AMATEURS
Kevan, 2E0WMG, 07766543784,
kevan2e0wmg@live.co.uk
18 Multi-Tx radio direction finding, Roy, G4JAC

EAST KENT RS
Karl Davies, M1DFM, 01227 710120,
karl.davies@talk21.com
1 Bring your holiday photos evening, plus Brian, M0DCO on how to take photos when sight impaired
15 Visit from Icom's Chris Ridley & John Turner

HARWICH ARIG
Kevan, 2E0WMG 07766 543784
kevan2e0wmg@live.co.uk
10 Two short tales by Arthur, M1FFU

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC,
020 8502 1645
5 OTA - data
19 Review of 2010 by the committee

LOWESTOFT & DISTRICT ARC
Phil, G0JSG, 01502585448,
pholden433@btinternet.com
4, 11, 18, 25 Club night at shack

NORFOLK ARC
Chris Danby, G0DWV,
01603 898678,
cmdanby@btinternet.com
3 Visit from RSGB President Dave Wilson, M0OBW
10 Informal, construction & workshop evening
17 The rise and fall of the Marine Radio Officer, Steve Appleyard, G3PND
24 Informal, construction, workshop and Bright Sparks evening

SOUTH ESSEX ARS
Norman, M0FZW,
01268 692776,
secretary@southessex-ars.co.uk
10 AGM

WEST KENT ARS
Les, G6UBM,
westkentars@googlemail.com
1 Kent Repeater Group, Martin Stoneham, G4RVV

13 EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, G0EJQ@RSGB.ORG.UK

BOLSOVER ARS
postmaster@g4rsb.org.uk,
www.g4rsb.org.uk
3 Natter night, all welcome
10 IOTA, Keith, G0THF
17 Quiz, Colin, G0RXT
24 Committee meeting

FRISKNEY AND EAST LINCOLNSHIRE COMMUNICATIONS CLUB
Chris M0MFP, 01507 442240
2 Shack night

LEICESTER RS
Alex, G8FCQ, 0753 120 1640,
http://leicesterradiosociety.webs.com
8 Bring and share BBQ
13 Club Calls 160m contest
22 ECO House lecture

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO,
01427 788356,
pamelagrose@tiscali.co.uk
3, 17 G5FZ OTA
6, 13, 20, 27 G5FZ OTA & work around the shack
10 Grantham Amateur Radio Club's DXpedition to Denmark DVD
24 Construction contest

LOUGHBOROUGH & DARC
Chris, G1ETZ,
01509 504 319
2 Mini talk, Art, G3KWY
9 The RSGB by Deputy Regional Manager John Rogers, M0JAV
6 RV Jones, George, G4EUF & Ian, G8SNF
23 Steam and things, Peter Haywood
30 Practical evening

MELTON MOWBRAY ARS
Geoff, G3STG, 01664 480 733,
G3STG@btinternet.com
19 Repair/refurbishment of vintage radio and TV, Bert Reeves

WELLAND VALLEY ARS
Peter D Rivers,
G4XEX, 01858 432105,
g4xex@fsmail.net
15 SWL talk

FREE MEMBERS' ADS
Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 89).

FOR SALE

2 x 17 ELEMENT 2m YAGIS inc power divider, £450. 2 x 8 element 4m Yagis £250. 4 el 4m Yagi, £40. 4 el 6m Yagi, £40. Trev, G2KF, 07974 892179 (Cornwall).

A43R MK 11, 212MHz 5ch, £30. Yaesu 101, modded by G3LLL extra channels, £30, dodgy switch, HP X-Y disp storage £40. B J Bonnaud, 01684 566028 (Malvern).

ALINCO 2m DJ-175E brand new, still in box – charger and car power supply, £90 ono. Also Kent key, immaculate, mahogany base, £50. Geoff, M1EDF, 01827 830644 (eves) (Tamworth).

ALINCO DX-77E, MFJ Versa Tuner and Watson SWR meter. Silent key sale, prefer to sell as a complete package. Buyer collects or arranges carriage. £300 ovno. Barry, G4CTU, 01562 823966, barry@bhitchins.wanadoo.co.uk (Kidderminster).

COMET H422 ROTARY DIPOLE 7, 14, 21, 28MHz. Never used, as new in box. Cost £269, sell £160 ono. Buyer collects and inspects. Fred, G4ROS, 01924 361357, frede.sweet@talktalk.net (Wakefield).

COMPLETE HF STATION from non smoking shack. Yaesu FT-757GX HF transceiver inc WARC bands, matching FC-757AT, autotuner, MD-1 basestation microphone, £299. DRAE 24A 12V PSU, £40. FT290 MK2, Mutek front end, mobile bracket, £75. Dual band 2m/70cm mobile ant £10. Adrian, G4UVZ, 01823 421751, adrianwhatmore248@btinternet.com (Taunton).

DRAKE TR7 plus PS7 PSU, workshop manual, set of extender boards. Solid state transceiver covering 1.5-30MHz, CW, SSB, AM, RTTY. 100W+ on all bands. AM and SSB filters, DFM. GWO. General coverage Tx/Rx, receive to DC. £450. Heavy! Buyer collects. Mike, G3TSO, 01451 888144, g3tso@yahoo.co.uk (Burford).

FRG7 AND DX394. Both receivers are working and in good condition. Will accept £50 each or £90.00 for both. Reason for sale being forced to downsize the shack. Peter, G3MZF, Peterg3mzf@aol.com (Leeds).

G3RPC SILENT KEY SALE. Kenwood TS-480HX 200W xcvr, £575, matching Diamond GZV4000 40A PSU £75. Diamond SX200 SWR/power meter £25. Classic radios for spares or repair: Drake SSB "twins" T4XC & R4C, KW 77 SSB HF xcvr (late 1960's) – offers. Tektronix 2213A 60MHz oscilloscope, OIRO £50. Carriage & insurance at cost from the Isles of Scilly. Strumtech Versatower serial T28202 FREE, requires dismantling & shipping to the mainland (shipping liaison assistance available). John, M1IOS, m1ios@aol.com (acting for G3RPC's family).

HEATHKIT DX40, rebuilt, VF1U, working well, £95. Eddystone 940, good all round, £190. KW 2000, Vespa & PSU, 201, 202, AR88LF, Lafayette HE30, HA350. Phone for details, all items buyer collects. Bruce, G3WCE, 01692 538794. North Walsham.

ICOM IC-2KL all mode HF linear amplifier with separate DC PSU. 500W+ output 10-160 metres. Interface cable included for IC756 transceiver for 'Auto' operation if required. Other interface cables can be easily made up or obtained. £800 Clive, G3TGF, 01435 864390 (Heathfield).

IC7600 immaculate, with USB keyboard, £2250. Buyer collects please. Dave, G8GPF, 07977 542753, G8GPF@serenata.org.uk (Bristol).

KENWOOD TS570D boxed with original manuals, mic and very good condition, £470. Colyn, GD4EIP, 07624 413036, gd4eip@manx.net (Isle of Man).

LINEAR AMP UK CHALLENGER II 1.5kW HF linear amplifier in mint condition with manual. Buyer to collect as it weighs 39kg. £750. Peter, MW0ZZD, 01994 484214, peterelias@btinternet.com (Carmarthen, S Wales).

MICROWAVE LINEAR AMPLIFIER model MML144/100S, 100W output, £50. Microwave 50MHz multimode transverter model MMT 50/144, £25. MFJ GDO 1.2-250MHz, £25. All in good condx. Postage extra. Mr D C Rowlands, GW3DRK, 01443 683912 (Porth Rhondda).

MICROWAVE MODULES 144/200s power amp, 3, 10 or 25W in for 200W output, £90. MM 144v low noise RF switched preamp, £25. Nissei 30A power supply (linear, not switch mode), £45. Watson power/SWR meter, HF to 144MHz, £5. All in good working order. Buyer to collect from Cardiff. Lyndon Leach, GW8JLY, 02920 576225 (Cardiff).

PALSTAR AT-1KP ATU. 1200W, manual. As new condx. With handbook, boxed, little used, £250. Various power/SWR meters, coax switches (latest types).Various VHF/UHF beams. Prefer buyer to inspect and collect, would despatch with carriage at cost. Bob, G8BCA, 01638 714051 g8bca@talktalk.net (Mildenhall, Suffolk).

RA17 for spares or repair, free to collector. Roger, G3REB, rog3reb@gmail.com (Gloucestershire).

RACAL RA117. Needs a good service hence low price, £50. Buyer collects. Paul, G0DUH, 01271 812654 (N Devon).

SIGNAL GENERATOR CT212 85kHz-32MHz in 7 bands. Output variable to 100mV. CW/AM/FM. 7xB7G valves. Admiralty issue 1957. Good condition. Handbook photocopy with schematic. Photo at www.portabletubes.co.uk Testing. 230VAC. 9x14x11inches. Weight 30lbs. Buyer collect. Best offers please. Peter Ball, G3HQT, 01489 570735 (Warsash, Southampton).

SK SALE. ALINCO DJ-X2E wideband communication receiver, charger, manual and earpiece. Offers (plus postage). Chris, G0RDK, 01782 773185, g1puv@yahoo.co.uk (Stoke-on-Trent).

SPECTRUM ANALYSER 150kHz-1.3GHz, Thurlby Thandar PSA 1301T. With operating and service manuals, all accessories and unused spare batteries. Hand-held instrument, internal battery or mains operation from supplied mains adaptor. £490 inc courier delivery. E. Allen, G3JHP, 01293 774303 (Horley, Surrey).

TELEGRAPH KEY RESTORATION BOOK. 8 1/2" x 11", 107 pages, 254 colour photographs. No pages are missing, no marks, etc. however there is light yellow line crossing some pages, doesn't affect the reading. £25 recorded postage paid UK. PayPal or cheque. Marcelo, LW3EOV, 07986 699554, marcelo0680@yahoo.co.uk (London).

HELPLINES

IMPORTANT NOTICE

RESPONDENTS ARE ADVISED NOT TO SEND ORIGINAL DOCUMENTS, BUT TO COPY THEM AND SEND THE COPIES.

Helplines is a free service that can be used to ask other members for help on amateur radio related matters. Items for inclusion can be e-mailed to radcom@rsgb.org.uk.

• Does anyone have a Daiwa SS-330X SMPSU (similar to SS-330W)? Mine has failed. I have the circuit diagram; it appears the start-up circuit (Q3/Q4/Q5 & T2) isn't working properly. If I connect a high impedance DVM from Q2(e) to ZD1/R12 junction, it immediately switches on and behaves normally! I need to know the normal voltages around this circuit to try to identify the faulty component. Rodney Fry, G3NDI, 01344 774590, e-mail g3ndi@rsgb.org.uk.

UNIDEN 230-e scanner 28-87, 108-174, 216-255, 400-512, 806-960, 1240-1300MHz, manual and charger, £99. Peter, GW0ETN, 07514 671202, gwoetn@yahoo.co.uk (Clwyd).

VIBROPLEX IAMBIC DELUXE, chrome, jewelled pivots. Boxed as new. Current price £195.95. First £98.50 secures. Collect or plus P&P. Kent brass straight key, polished wood base. Boxed, as new. Current price £91.59. First £47.50 secures. Collect or plus P&P. Bill, G0EOL, 01606 594205, billg0eol@o2.co.uk (QTHR, Cheshire).

W2IHY 2 BAND EQUALIZER & Noise Bridge, 12V PSU, manual with operating instructions & circuit diag. Mic input switchable I.Y.K. Output cable Yaesu but can be reconfigured. Noise bridge very effective for noisy fans etc. £55 inc carriage. Colin, G3UZM, 01395 273090 (Exmouth, Devon).

YAESU FL2100B linear amplifier, excellent condition, manual, £150. Racal RA17L, £60. Marconi TF114H and 301 sig gens, £15. CR100, CR300 RXs, £50. Sailor 76D HF Tx, £25. GE Transmitting valves CG203 unused, boxed. 19 inch equipment rack £5. C Young, RS141742, 01637 875848, rcry100@yahoo.com (Newquay).

YAESU FT-897 (100W HF) and FT60 (2m & 70cm). Shack clearance, mobile and home antennas, chargers, batteries, ATU, PSU, SWR meters etc. All good condition, light use and can demonstrate. David Jardine, G0FDV, 01435 865500, dj@ukpc.net (Heathfield, East Sussex).

YAESU FT-1000 MP MARK 5 200W, Yaesu power supply FP-29, Yaesu SP-6 speaker. Had it from new, mint condition, boxed, manuals, no scratches, non smoker. Try before you buy, £1495 ovno. M0CVS, 01629 823025 (Matlock, Derbyshire).

YAESU FT100D boxed, complete, in unmarked mint condition, little use, c/w Data Interface & cables, £375. Yaesu FC20 matching auto ATU, fine scratches to lid, perfect W/O, £120. Both collect or P&P at cost. Email for photos or more details. Ian, G1HQK, 07963 198883, g1hqk@yahoo.co.uk (Lowestoft).

YAESU MD-1 desk mic, excellent condition, £100 + carriage. VC300DLP 300W ATU/power meter/dummy load/antenna switch, £100 + carriage. Tokyo HyPower 60W 50MHz linear amp, £60 + carriage. Yaesu FRT-7700 receive ATU, £35 + carriage. Michael, G4OCR, 0161 881 9544, michael@bolton.ac.uk (Manchester)

Continued on page 88

RadioFairs

West London Radio & Electronics Show
Sunday 7th November 2010
The UK's Premier Rally
.....In The South

- Lecture Stream, QRSS and other Home Brew QRP projects by Hans Summers G0UPL, DSTAR and the GB3OK Repeater by Gary Stevens 2E0ULA, What Height is your HF Antenna? By Professor Mike Underhill G3LHZ, ARDF by Bob Titterington G3ORY
- New trading Floor Layout
- All New Website Layout
- Easy access from all of the UK via the M25, M3, M40 and M1 with plenty of free parking. Kempton Mainline railway station within walking distance of the show.
- RSGB book stand
- Major UK distributors present showing the latest equipment from the Yaesu/Vertex, Kenwood, Icom, Alinco etc.
- Trade stands selling antenna, components, batteries, computers, disks, software, etc, etc.
- Larger area for club stands with local clubs represented.
- Massive Bring and Buy stand
- Major UK organisations such as BATC, WAB etc represented.
- Main UK Radio and Electronics Publishers present
- Superb Panoramic Restaurant.

Opening Time 10am, Admission £4, Tickets 9.15am, Disabled Access 9.45am, Under 16's free Entry

For Trader table bookings please phone, fax or email your order - flea tables subject to availability

www.radiofairs.co.uk **info@radiofairs.co.uk** **For Bookings Tel: 0845 1650353 or Fax: 0845 1650352**

WANTED

600HZ CW FILTER type XF-30C for Yaesu FT-101E. Gordon, ZS2GH, gharris@mandelametro.gov.za (South Africa).

ANYONE WHO HAS a Radio Shack DX200 HR receiver, working, please contact Geoffrey, M1EDF, 01827 83064 (Tamworth).

DISABLED FAN OF OLD DAYS seeks pre-1975 QSLs, magazines, etc. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

KENWOOD SM 230 station monitor with patch lead. Allen, G4PF, 07740 582 316, theboggarts@aol.com (Lancashire).

KENWOOD TS-2000X must be late model serial number 903 onwards, boxed. Derek, G4XEE, derek.bate@talktalk.net (QTHR, Stoke-on-Trent).

LABGEAR LG-300 transmitter and modulator unit, working or in need of repair. Geloso 4/102 VFO in good condition with dial. Geloso amateur band receive converter IF 1.5MHz either KW or Geloso model. KW Vanguard transmitter in good condition or needing repair. Mike Giddings, G3XLB, 0208 776 7791 (Sydenham).

MARCONI LITERATURE on Morse Keys wanted please. Looking for paperwork / design drawings / books etc, in fact any written Marconi literature on their Morse keys from the late 19th century on. Also looking for old Morse keys. John, G0RDO, 01626 206090, john@morsemad.com (Newton Abbot).

PRACTICAL WIRELESS No. 1 Denco coils green. Are there any radio kits out there? John Savage, G1IMQ, 01793 762593 (Swindon).

PLEASE HELP ME with *Single valve receivers*, Bernards book series no. 99. Also *Two valve receivers*, no. 101. There are 35 - 186 Bernards books I have listed. I would like a full Bernards library. Copied or digital copies. Ian, G3WRT, 01473 311665 (Ipswich).

TALKSAFE (BLUETOOTH) RANGER unit C/W appropriate cable for an Icom E-92D D-Star handy. Steve, G6UYG, 01743 289816, G6UYG-WANTED@usa.net (Shrewsbury, Shropshire).

EXCHANGE

HEATHERLITE EXPLORER HF linear 1.5kW, would consider Ameritron amp AL-811XCE 600W or similar linear. Conrad James, 07932 473 601, c.james@sky.com (Croydon).

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

7 NOVEMBER – WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. OT 10.00. TS, FM, DF, free CP, RSGB, LEC, TI S22 (V44). Paul, M0CJX, 0845 165 0351, info@radiofairs.co.uk [www.radiofairs.co.uk].

7 NOVEMBER – FOYLE & DISTRICT ARC ANNUAL RALLY – Best Western White Horse Hotel, 68 Clooney Road, Derry BT47 3PA. OT 12 noon. TS, RSGB, SIG [www.mn0aku.co.uk].

13 NOVEMBER – ROCHDALE & DISTRICT RS TRADITIONAL RADIO RALLY – St Vincent's Church Hall, Caldershaw Road, Rochdale OL12 7QL. OT 10.15/10.30am, £2.50, concessions for U12 and seniors. B&B, C. Details Dave, G0PUD, QTHR, 07710 243 107, e-mail dave.shaw1@sky.com. [www.radars.me.uk].

21 NOVEMBER – 33rd CATS RADIO & ELECTRONICS BAZAAR – 1st Coulsdon Scout HQ, r/o Council Car Park, Lion Green Road, Coulsdon, Surrey. 10.00-13.00, £1, B&B, C, DIS, DF, CP free. Details Andy, G8JAC, e-mail secretary@catsradio.org.

21 NOVEMBER – PLYMOUTH RADIO CLUB RALLY – Elm Community Centre, Leypark Walk, Estover, Plymouth PL6 8UE. CP, TI, OT 10.00, £2, TS, B&B, C, WIN.

28 NOVEMBER – BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY – Spennymoor Leisure Centre, Co Durham DL16 6DB. CP, TI S22 (V44), OT 10.15/10.30, £1.50 (U14 free). TS, B&B, C, LB, DF, FAM. Details Mark, G0GFG, 01388 745 353.

16 JANUARY 2011 – NEW VENUE – RED ROSE WINTER RALLY – George H Carnall Leisure centre, Kingsway Park, M41 7FJ. DF, free CP, B&B, C, LB, OT 11am, TS, SIG, DF, RSGB bookstall. Details from Steve, 07502 295 141 [www.wmrc.org.uk].

16 JANUARY 2011 – DOVER AMATEUR RADIO CLUB RALLY – Whitfield Village Hall, Dover CT16 3LY. One of the first events in the 2011 season. TS, TI via GB3KS, C. [www.doverradiorally.com].

30 JANUARY 2011 – HORNCASTLE WINTER RALLY – Horncastle Youth Centre, Lincolnshire LN9 6DZ. 10.30am, £1.50, DF, C, free CP. Tony, G3ZPU, 01507 527835, e-mail G3ZPU@yahoo.co.uk.

6 FEBRUARY 2011 – 26th CANVEY RADIO & ELECTRONICS RALLY – 'The Paddocks', Long Road, Canvey Island, Essex SS8 0JA [southern end of A130]. Free CP, OT 10.30, £2, C, DF, TS. Dave, G4UVJ, 01268 697 978 (evenings) [www.southessex-ars.co.uk].

6 FEBRUARY 2011 – RADIO-ACTIVE RALLY – Civic Hall, Nantwich, Cheshire CW5 5DG. CP, OT 10.30, TS, B&B, C. Simon Chettle G8ATB, 01270 841506, e-G3at@aol.com. [www.midcars.org].

13 FEBRUARY 2011 – HARWELL RADIO AND ELECTRONICS RALLY – Didcot Leisure Centre, Mereland Road, Didcot OX11 8AY. TI S22 (V44), free CP, £2.50 (u12 free), OT 10.15/10.30. TS, FM, SIG, LB, C, DF. Details from Ann, G8NVI on 01235 816379, e-mail rally@g3pia.org.uk [www.g3pia.org.uk].

SILENT KEYS

We regret to record the passing of the following members:

Mr J E Smith, GM0JCX	2/8/2010
Mr E W Spence, G1OGJ	
Mr W J Crossan, G3BWY	16/8/2010
Mr H Vowles, GW3RHC	22/5/2010
Mr G H Robbins, G3LNG	4/9/2010
Mr G A Gayton, G4CJU	2010
Mr J T Macrae, G4DXI	26/9/2010
Dr R Hart, G4EJL	13/12/2009
Mr N S Lowson, GM4XRF	10/9/2010
Mr J D Collinson, G7ULH	21/8/2010
Mr G K Otway, G8AGT	23/11/2009
Mr J A Haworth, G8ZEF	23/7/2010
Mr R I Redford, MM0CTS	
Mr I Hughes, MW1FBK	12/8/2010
Mr H Bremner, RS94838	24/9/2010

6 MARCH 2011 – EXETER RADIO & ELECTRONICS RALLY – America Hall, De la Rue Way, Pinhoe, Exeter, EX4 8PW. OT 10.30 (10.15), £2, TS, B&B, C, TI. All profits from the event are shared between GB3SW, GB3EW and GB3EX, the local 2m and 70cm repeaters. Contact Pete, G3ZVI, 07714 198374, e-mail g3zvi@yahoo.co.uk.

13 MARCH 2011 – 26th WYTHALL RC RADIO AND COMPUTER RALLY – Woodrush Sports Centre, Shawhurst Lane, Hollywood, nr Birmingham B47 5JW on the A435, 2mi from J3 M42. TS, C, B&B, CP, TI S22 (V44). Contact Chris, G0EYO, 07710 412 819, e-mail g0eyo@blueyonder.co.uk [www.wrcrally.co.uk].

19 MARCH 2011 – LAGAN VALLEY ARS RALLY – The Village Centre, 7 Ballynahinch Road, Hillsborough. OT 11.30, TS, CP, C. Contact Jim, GI0DVU, 02892 662 270, e-mail jim.henry@ntlworld.com.

20 MARCH 2011 – 27th YEOVIL QRP CONVENTION – Digby Hall, Hound Street, Sherborne, Dorset DT9 3AA (adjoining the central shopping car park). OT 9.30am, TI S22, CP, TS, LEC, B&B, C, DIS. Contact Derek, M0WOB, 01935 414 452.

10 APRIL 2011 – NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION (Blackpool rally) – Norbreck Castle Exhibition Centre, Blackpool. TI, CP, TS, B&B, SIG, MT, LB, C, DF, RSGB book stand. OT 10:45/11:00. Dave, M0OBW, 01270 761 608, e-mail dwilson@btinternet.com [www.g1gyc.demon.co.uk/narsa].

This list shows all rallies and events we are aware of as at 5 October 2010. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e–mail (to GB2RS@RSGB.org.uk) then we suggest you set your e–mail program to request a 'read' receipt so you can be sure we've seen the details.

TI Talk-In; CP Car Park; £ Admission; OT Opening time - time for disabled visitors appears first, (eg 10.30/11am); TS Trade Stands; FM Flea Market; CBS Car Boot Sale; B&B Bring and Buy; A Auction; SIG Special Interest Groups; MT Morse tests; MA Foundation Morse Assessments; LB Licensed Bar; C Catering; DF Disabled Facilities; WIN prize draw, raffle; LEC Lectures/Seminars; FAM Family attractions; CS Camp Site.

SPECIAL EVENT STATIONS FOR NOVEMBER 2010

These callsigns are valid for use from the date given, but the period of operation may vary from 1 - 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Details published here are kindly provided by Ofcom.

How to get the best out of the QSL service for Special Event Stations

I sort about 50,000 Special Event QSL cards a year and about 20,000 get destroyed after 3 months because they are unclaimed. If you operate a Special Event station, please send stamped SAEs and claim your cards!

Anyone can lodge stamped SAEs with their QSL manager in order to receive cards. You only need to be an RSGB member to *send* cards via the Bureau.

There is NO VIA system in the GB series (nor has there ever been). Cards will *not* come out to you via your personal callsign – you *must* send separate stamped SAEs to me to receive your own Special Event Station's QSL cards.

I can be e-mailed via qsltrek@hotmail.co.uk and I operate a website at www.gb-special-event-qsl-status.webs.com where you can check your SAE status and get other pertinent information.

Please help out by passing this info on to other Special Event enthusiasts that you know.

Davina Williams, M0LXT, QSL manager for the GB series (GBxAAA-GBxZZZ)
20 Neale Close, Wollaston, Northamptonshire NN29 7UT

Date	Callsign	Phonetics	Location	Bands	Keeper
01/11/2010	GB0BTC	Belfast Titanic City	Belfast	LH	GI0VAB
	GB2EWW	Easthams' World War	Eastham, Merseyside	LH	M0BZZ
	GB70CBC	Coventry Blitz Commemoration	Coventry Cathederal	LH27	G8GMU
	GB0AD	Armistice Day	Aderdare, Glamorgan	LH2	GW0JTY
05/11/2010	GB2SYS	Sheringham Y Station	Sheringham, Norfolk	LHV27	G7FSI
09/11/2010	GB2AD	Armistice Day	Lurgan, Co Armagh	LH2	MI0MVP
20/11/2010	GB4RN	Royal Navy	Waterlooville	TLHV2	G3LIK
22/11/2010	GB0LD	Lancashire Day	Preston	TLHV27	M0GWW
27/11/2010	GB1LD	Lancashire Day	Preston	LH27	G3NQX
	GB70SCH	Stenigot Chain Home	RAF Stenigot LN11	TLHV27	M5ZZZ

3 APRIL 2011 – SOUTH GLOUCESTERSHIRE AMATEUR RADIO RALLY – Avon Scouts Activity Centre, Fernhill, Almondsbury BS32 4LX (junction of M4 & M5). OT 10.00, CP, DF, C. CBS, TI S22 (V44). Stan Goodwin, G0RYM, 07833 517370, gentryone@googlemail.com [www.avonscouts.org.uk/woodhousepark].

17 APRIL 2011 – LOUGH ERNE AMATEUR RADIO CLUB 30th ANNUAL RALLY – The Share Holiday Village, Lisnaskea, Co. Fermanagh BT92 0EQ N. Ireland. Access from Erne/Shannon Waterway. OT 11.30, CP, B&B, TS, LB, C, DF. Details Iain 028 66326693, e-mail iain@learc.eu. [www.lougherneradioclub.co.uk].

1 MAY 2011 – DAMBUSTERS HAMFEST – Thorpe Camp Visitor Centre, Coningsby, Lincs LN4 4PE. TI S22, GB4FR & GB3FJ, £3 under 12 free (incl traders and their companions), free parking, Pitches free but size is limited if not pre-booked. RAF heritage centre on site. Overnight camping. C, OT 10.00, RSGB bookstall. David, david@g1zqd.demon.co.uk.

12 JUNE 2011 – 10th JUNCTION 28 QRP RALLY – South Normanton Alfreton and District Amateur Radio Club (SNADARC) in association with the G-QRP Club. Alfreton Leisure Centre, Church Street, Alfreton, Derbyshire DE55 7BD. Just 10 minutes from M1 J28 and the A38. OT 10, TS, B&B, SIG, C. Russell Bradley, G0OKD on 01773-783658, e-mail russell.bradleyG0OKD@ntlworld.com [www.snadarc.com].

19 JUNE 2011 – NEWBURY RADIO RALLY AND BOOT SALE – Newbury Showground, next to M4 J13. Big display area of amateur radio stations, exhibitions, special groups, clubs and societies. TI S22 (V44), free CP, OT 9.00, £2, TS, C, DF, FM, SIG. Sellers have access from 8am and pitches cost £10. Details from rally@nadars.org.uk [www.nadars.org.uk].

26 JUNE 2011 – WEST OF ENGLAND RADIO RALLY – Cheese & Grain, Bridge Street, Frome, Somerset BA11 1BE. TS, RSGB Books, C, CP, DIS. Contact Shaun, G8VPG, 01225 873 098, e-mail rallymanager@westrally.org.uk [www.westrally.org.uk].

17 JULY 2011 – QRP IN THE COUNTRY – Upton Bridge Farm, Long Sutton, Langport TA10 9NJ. SIG, B&B, LEC, C, LB, FAM. Free entry. Tim Walford, G3PCJ, 01458 241224, e-mail walfor@globalnet.co.uk [www.walfordelectronics.co.uk].

31 JULY 2011 – HORNCASTLE SUMMER RALLY – Horncastle Youth Centre, Willow Road, Horncastle, Lincolnshire LN9 6DZ. 10.30, £1.50, DF, C. Tony, G3ZPU, 01507 527835.

14 AUGUST 2011 – FLIGHT REFUELLING ARS HAMFEST – Mike, M0MJS, 01202 883 479, e-mail hamfest@frars.org.uk [www.frars.org.uk].

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the email address.
2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or membership number, telephone number and postal town, in that order.**
3) The Ad may not contain more than 40 words, excluding the information in (2), and may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

RADCOM MEMBERS' AD REQUEST FORM

Only use this form if you are unable to send your advert by e-mail. E-mailed adverts are free. A charge of £5 is made to cover administration costs for Members Ads submitted by post. Photocopies of this form are acceptable. Posted ads must not exceed 40 words. Please fill in all details, especially your name, callsign, phone number, town and your signature or your advert may not be accepted.

☐ I enclose a cheque for £5 payable to RSGB

☐ Please charge £5 to my credit card

Number

☐☐☐☐-☐☐☐☐-☐☐☐☐-☐☐☐☐

Expiry date MM-YYYY Issue number (Switch only) ☐☐

Name

Callsign

Phone

Town

Signed

Date

Section: ☐ FOR SALE ☐ WANTED

CLASSIFIED ADS

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

FOR SALE

ISOLATED DATA INTERFACES for PSK31-SSTV-RTTY-CW-FSK-WSJT etc. ALL PREVIOUS MODELS STILL AVAILABLE. See RSGB Reviews SEPT 09 RADCOM. PAYPAL REGISTERED. www.g3liv.co.uk johnny@melvin.com 0191 2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

PROGRAMMING AND DATA MODE CABLES for Icom, Yaesu, Kenwood, Ten-Tec, Motorola, Vertex, and many other brands at www.radioarena.co.uk Tel. 0845 0942245 info@radioarena.co.uk

X-TALS 3.560/7.030/10.106/10.245/ 14.060MHz £5-95/set Pr Carrier 10.7MHz +/- 1.5kHz, 9.0MHz +/-1.5kHz £3-95/pair 7x9MHz Matched ≤30Hz £6-95/set P&P £1-50 + VAT. Many freq ex-stock. vincentvoy@hotmail.co.uk 0208 391 0545

CTCSS, DTMF and PIC kits, low prices, all in stock, low postage costs, www.cstech.co.uk

SCAM 12M TELESCOPIC PNEUMATIC MASTS. Ex military masts; all checked working, but choice of standard (unspecified performance), or refurbished with all new seals and O rings. Details from m0rbs@btinternet.com

WANTED

UNWANTED VALVE AMPLIFIERS, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Cash paid. Contact Peter G3ZRS on 01482 862323 or e-mail: g3zrs@hotmail.co.uk

AERIALS

THE ROTARY DUAL BEAM PRO 40-10m 16ft overall. A break through in compact antenna design! www.proantennas.co.uk

GROUND MOUNTED I-PRO HOME 40-10m 5m tall vertical dipole, minimum visual impact! www.proantennas.co.uk

LIQUID ELECTRICAL TAPE- waterproofing for outdoors. £9.50. Velcro straps - ideal for supporting temporary antennas. £5.99. Antenna poles. 7m fibreglass. £17.95 Prices include p&p. SOTAbeams, 89 Victoria Road, Macclesfield, SK10 3JA. 01625-425700 www.sotabeams.co.uk

M0CVO ANTENNAS HF, VHF and UHF antennas, fixed or portable. Full details at: http://www.m0cvoantennas.co.uk

CARDS & DESIGN

QSLERS 100 FULL COLOUR CARDS £24 including design and postage. 1000 full colour cards £75 inc postage. M0DOL Chris, 24 Westridge, Northampton NN27RA

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.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

EQUIPMENT

VHF/UHF ACCESSORIES and aerials, TVI filters, 4m & 6m transceivers. GAREX ELECTRONICS PO Box 52, Exeter EX4 8WX Tel: 07714 198374 www.garex.co.uk

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376 email: radiorepairs@btconnect.com

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE FOR YAESU RADIOS. http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

CONTEST LOGGERS - SD by EI5DI. RSGB and international contests. HF €25, VHF Free. www.ei5di.com

BUSINESS CARDS

CLASSIFIED ADS

AN OPEN DOOR TO HIGHER NOISE LEVELS

Derek, G1ZJQ

My local club set up a DIY D-Star repeater last year. There was a flurry of activity, with most members investing in new Icom radios and finding out how to set them up. This year, it has been apparent that local simplex D-Star contacts are still as popular as hens' teeth and the repeater certainly isn't overused. The general lack of VHF/UHF signals will not help our case to keep these bands: 2½ hours on one Tuesday night per month, a few weekend contests and white noise in between would not impress me, if I was Mr Ofcom. Apologies, I digress.

Curious about D-Star, I asked club members what they heard between overs. Answer: nothing, no audio output is generated unless a D-Star signal is decoded; no squelch control is used because there is no hiss. Does this mean that if we all convert to this mode, or similar, then nobody will notice the increasing interference on the bands? That would fit in well with Ofcom's stance on PLT: no complaints because nobody can hear it. The RSGB fights against PLT yet also puts forward the idea that these digital modes are the way forward. Once interference reaches a certain level, even D-Star will not cope. By that time, it will be too late… oh dear.

My current solution is to keep using old ±5kHz FM deviation on 2m. The ±2.5kHz deviation FM requires higher volume to be set, resulting in louder hash between overs. The paucity of stations means there is plenty of bandwidth available for the wider deviation. Some would call me a dinosaur, yet the audio report for the IC-2E was glowing. It might be obsolescent but at least it results in a signal and conversation on the band instead of sitting reading some internet forum. It's time to dust off that old hand-held, get up a local hill and use it or lose it.

Viva analogue, it has its place.

Don Beattie, RSGB Board Member replies: Listening on analogue modes to establish if interference is present should always be the starting point. More specifically, AM reception often highlights the presence of interfering signals most effectively. With digital (eg D-Star and DRM broadcasts) it is quite true that up to a point (the point beyond which the decoding software can't accept the reduced signal-to-noise ratio) there will be little effect of an interferer. Beyond that point, however, the signal will generally disappear completely and, as the writer says, there will be silence – even though there is major interference on the channel!

DIGITAL RADIO

Jim Wheeldon, M0JHW

I wonder if anyone else out there is having problems with analogue/D-Star?

How many of you have got repeaters programmed into your radio? There you are driving along, radio in scan mode, when all of a sudden comes an ear shattering noise from a repeater that is running dual mode and someone has opened the repeater using digital mode.

Surely the powers that be could have put digital somewhere else and not on existing repeaters? Analogue and digital will not work together on the same repeater; it just causes problems for all users.

Could they not be allocated to other sections of the bands like slow scan etc has been?

Just look at the number of users that have moved from repeaters that have gone dual mode to other frequencies. One of my local repeaters, GB3IN, is a perfect example. It used to be in use nearly all day, now you hardly hear anyone on it.

Please, please can the powers that be sort something out? Let those that want digital have their own repeaters.

Geoff Sims, G4GNQ

Whilst the advent of digital services may be a boon to amateurs generally with the reduced problems of interference to television and broadcast services, sadly it does have a downside that we as amateurs may become entrapped in. With analogue signals weak signal reception was patently obvious but digital broadcasts are not affected in the same manner. However they are very much affected by atmospheric and solar activity that results in severe pixilation and exceptionally poor sound quality. Whilst the signal strength is more than adequate, signal quality varies hourly dependant on the distance from the transmitted signal. As a strictly analogue station, it makes me wonder if all these high tech amateur transceivers could fall into the same trap. Long live homebrew.

John McCullagh Chairman of the RSGB's ETCC replies: *Thanks to all those who have written to RadCom on digital issues and I will try to encompass all their points in a single response.*

I cannot accept that encouraging experimentation with digital modes in any way compromises the RSGB stance on PLT. If interference is being experienced then digital modes will also cease to work and it will soon become very evident to the user that a once workable digital link is no more and that something is amiss.

In the case of dual mode or sharing of frequencies between analogue and digital repeaters then unfortunately in many areas there is little option but to permit this as the VHF repeater spectrum is very congested. You may have seen a statement on our website www.etcc.rsgb.org about our policy on 2m where we have been under pressure to accommodate a number of additional stations using digital modes. It has become clear that it is not possible to create a new overlay digital network on top of the existing analogue repeater network. As a consequence of this, the ETCC have agreed that proposals for digital nodes in this band can no longer be recommended to Ofcom unless the proposal incorporates a plan to either close down an existing repeater in the area, replacing it with a digital node or convert the repeater to dual mode working. With the use of CTCSS analogue stations should be able to eliminate the 'ear shattering' noise that one writer refers to.

It is, of course, a fact that digital transmissions tend to work well right up until they fall over the 'digital cliff' where any error correction that is being employed can no longer cope and signals just vanish. This can, of course, be seen on digital TV where as errors increase pixellation of the picture occurs and in voice radio the Donald Duck or R2D2 effect becomes apparent. This is the equivalent of fading into the noise on analogue but in a well implemented digital system, error correction can actually extend the workable range to a point where analogue signals would be very noisy indeed. The downside is as already mentioned the sudden dropping of the communications link.

One writer refers to the use of 5kHz FM deviation to avoid the louder hash between overs because the use of 2.5kHz deviation FM requires a higher volume to be set. I would point out that the 2.5kHz standard for 2m was introduced many years ago and repeater receivers and transmitters are required to use narrow channel spacing, the use of wide deviation will result in distortion and clipping and should be avoided particularly on repeater channels.

I would conclude by agreeing that there is no doubt that there is still a place for analogue radio and if you look at the UK repeater network the vast majority of installations are still analogue. However it would not be in the best traditions of amateur radio if we did not accept and adopt new technologies as they arrive on the scene. We are not forcing anyone to use these technologies but we should not prevent others from doing so especially if it is to extend and improve our knowledge.

CONTEST CW SPEEDS

John, G3XYF

I enjoy CW contests but am frequently dismayed by the increasing number of stations that insist on working at 30wpm or more. I am sure they are using readers / Skimmers and sending by computer etc. I prefer to operate manually at around 20wpm, ie receive by ear and send by paddles or pump key. Any one who operates by ear at 30wpm has my greatest respect. I suspect many CW contesters are using aids. If they are then we may as well forget CW and use PSK, RTTY or other digi modes.

I am convinced we are discouraging many potential CW contesters by operating as I have suggested. I think we ought to have some kind of maximum speed ruling particularly in RSGB Club Contests, after all the idea of these contests is to promote more contest activity especially with the newly licensed.

I maybe wrong and before you think it – I do not consider myself 'A grumpy OM' I am in my fifties! Am I the only CW op thinking along these lines?

Ed Taylor, GW3SQX, Chairman, RSGB Contest Committee, replies: *It's true that many CW operators operate at 30wpm, sometimes more. Part of the skill of being a good CW operator is being able to copy and type (or write) at this speed. CW contest operators would never use a Morse reader on HF – they are really only suitable for perfectly-sent, interference-free CW and that can be rare during contests! Good CW operators have*

built up their speed with years of practice and are able to pick out a high-speed CW signal from a dozen callers, reading information accurately and quickly so as to maximise their scoring rate. Much (but not all) of the CW sent during contests is done by computer, simply to maintain accuracy. There is debate about the use of Skimmer technology, which will normally put an operator into the 'assisted' category of a contest.

A station calling at 20wpm or slower may well be ignored if there are others calling at 30wpm, but later in a contest when things have calmed down, a slower caller will be very welcome. Most operators slow down to the caller's speed, because they know that if they don't, they will have to waste time on repeats. Some RSGB contests, including the 80m Club Championship, have areas of the band where operators should keep their speed down and they are welcomed by newer contesters. The Contest Committee has as one of its goals to bring new people into contesting of all types and has been pretty successful with newer licensees in recent years.

RADIOLOCATION

Bernard Spencer, G3SMW

I was pleased to learn from Bob Titterington's comments that the RSGB ARDF Committee is not "dedicated" solely to IARU events, although their website might imply that. Of course, these fine events require skill and mental agility in addition to some physical exertion, but accurate DF bearings do not play a great part in it. It could be useful and fun to also have location by fixed DF stations. That is not new, but none the worse for that.

My interest in DF started in the 1930s, and my subsequent professional involvement in the design of Homing and Radionavigation Systems leaves me in no doubt that there is still much to learn. Because of their larger numbers than the professionals, radio amateurs could probably add significantly to the knowledge, at all frequencies, including the difficult paths at HF via the ionosphere. Doubtless there would be fewer amateurs interested in this than in Fox Hunts, but that is not relevant.

I look forward to Bob's Column in *RadCom* in January 2011 on improving bearing accuracy. On the wider subject of radio navigation, which I mentioned, some of this could be done with little expense or trouble. It is a bold man who would predict what might or might not be desirable in the event of a major natural or man-made emergency.

DX CODE

Denny, M3HSJ

I have just read the article on the DX code and feel I must relay an incident that happened to me last year.

Whilst floating around 20m I came across a very strong signal from Estonia (ES) calling CQ. He was 59+ at my QTH, so I was eager to snap him up for my log, unfortunately he brought a huge pile up with him of Ws, Ks, As and a few Is to boot. I thought that I would have no chance but I persevered. I was giving my full call on the break but was drowned out by the higher power stations. After about 30 minutes of trying I was ready to quit and turn the radio off but thought I would try one last time and duly gave my full callsign. After a brief silence I heard "Could the Mike 3 station go again please..." I repeated my full callsign but was obliterated by the higher power stations again! This time the reply was a bit more stern and concise, "Could everyone please hold on I have a Mike 3 station trying to make contact and has been for some time now so the Mike 3 station only please… Mike 3 Hotel something something go again please". I was blown away… I duly swapped signal reports and thanked him for his patience and help and for those who could hear me (not many probably) I duly thanked them for letting me have 'my turn'. I can't remember his full callsign and, as the laptop the log was stored on is no more, I probably will never find out again.

So if by some miraculous coincidence the ES station is reading this and can remember my call (unlikely I know) then you deserve some sincere credit and thanks. A lot more operators like you are certainly what's needed! I have signed up to the code on www.dx-code.org and urge more to do so to stamp out the poor operating practices heard not just on HF but all bands and not just SSB but CW, RTTY and PSK. I believe the best form of policing the bands is to police yourself and set an example to other operators.

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END-FED ANTENNAS

Colin Shaw, M5FRA

I was delighted to see the article by Steve Nichols on end fed half wave antennas in the October edition of *RadCom*. I discovered the EFHW antenna a few months back and have had great success with both vertical and horizontal versions and I thoroughly recommend them as easy, cheap and efficient DX antennas.

On a recent trip to the West Wales I setup a vertical, fishing pole version of a 20m EFHW in a National Trust car park above a beach. On the first tune around I heard BH7PFH, VU2DK, VK4TUX, VK2IR, W6CCP, W8XH on phone and on CW, W7VV who I think was in rag chew QSO with WA9FZ. The VKs were a good steady signal and this was when the solar flux index was in the low 80s so not the best time for DX! I also made some good QRP CW contacts with just 2W.

At home a horizontal version strung up a mere 3-4m above ground across the long side of a triangle made by corner of the house has produced good results. I have made several CW contacts at 2000+ miles with this simple antenna.

Unlike Steve, I prefer to use a counterpoise instead of the link between primary and secondary of the matching circuit. On the horizontal that consists of a piece of wire about 1.5m long, connected to the secondary winding, which just drops off the windowsill onto the floor. Having checked the SWR with an MFJ-259B I can confirm Steve readings ie a perfect match!

See www.m5fra.org.uk for more details.

O Jackson, G3LKZ

The good performance of the end-fed half wave antenna is quite correctly praised by G0KYA and the perceived difficulty of feeding into a high impedance seems to be the reason it remains relatively unpopular. However, I cannot agree with the statement that "with an end-fed halfwave, there is very little current flowing in the ground and (an earth system) becomes almost unnecessary."

This is totally incorrect and is a myth to often repeated in other radio literature. In reality the current, very low at the feedpoint will increase as you move away from the base and reach a maximum around 0.35 wavelengths. The feed arrangement shown in Figure 1 will probably encourage current on the coax outer and cause it to act as a counterpoise. In theory the feed shown should not work at all.

So regardless of whether you prefer quarter wave or half wave, the existence of a counterpoise, radials, ground plane or whatever, remains an essential part of the overall antenna system if significant earth losses are to be reduced.

Steve Nichols, G0KYA replies: *Thank you for your letter. You are quite right - there are ground currents, but experience and computer modelling has shown that these are much lower than you get with a quarter wave vertical. The antenna as designed uses the coax outer as a counterpoise and in all the models that have been built there have been no RFI/EMC problems. This may be because the coax is on the ground, giving stray capacitance to earth. If problems are found you can easily remove the link wire on the toroid secondary and fit a short counterpoise instead. Numerous people have now built the EFHW to my design and have reported great results, so ground losses don't appear to be a significant problem. One user reported 1-2 S-points gain on DX compared with his doublet.*

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

KENWOOD

Introducing the NEW TS-590S

By the time this advertisement appears I should have received my first shipment of this very exciting and class leading HF/6m Transceiver from Kenwood. Why exciting? In 32 years of selling HF Radio there have been some real milestones in HF design along the way. Remember the TS-830, TS-930, TS-940 & TS-950SDX? Only four years ago Peter Hart still rated the latter as one of his "top five" HF transceivers reviewed by him in the last twenty years, even though it ceased production in the nineties. This month, Kenwood present their new, designed from the ground up TS-590S, with all the heritage and experience of producing benchmark HF equipment before them.

Among its many appealing features, the new TS-590S employs down conversion for the first IF, resulting in Excellent Dynamic Range when adjacent unwanted signals are present. It is also equipped with a 32-bit Floating-point DSP featuring advanced technology that enables unique IF AGC. These and other cutting-edge technologies realise the first-rate RX performance that HF enthusiasts all over the world have been waiting for.

Superb RX Performance: Excellent dynamic range, even with powerful off-frequency interference

Powerful 500Hz / 2.7kHz roofing filter

DDS offers superb C/N (Carrier to Noise Ratio) characteristics, significantly cutting noise generated by adjacent unwanted signals

Built-in automatic antenna tuner

Wide range of features thanks to 32-bit floating-point DSP
Advanced AGC with digital signal processing from the IF stage onward

Stable operation guaranteed. Designed for high reliability

100W heavy-duty design

Superior ease of operation, plus a more enjoyable TX/RX performance

User-friendly menus, outstanding operating ease

Large display with 2-colour LED backlight

USB connectivity for PC control

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

The recommended selling price of the TS-590S is £1489.95 but I will, of course, be offering a very competitive package to the first lucky dozen or so that take advantage of my early order into Kenwood. It also goes without saying that I will be offering exceptional trade-in values for your existing equipment, especially TS-570's, the 590's predecessor.

Call now to discuss how I can get this 2010 masterpiece from Kenwood into your shack today!

Kenwood HF Products

TS-480SAT	Remote head HF/6m 100W inc ATU Transceiver	£749.95
TS-480HX	200W version of above, no auto-ATU	£849.95
TS-2000E	100W HF/6/2m & 50W 70cms, with auto-ATU etc.	
TS-2000X	As above but fitted with 10 Watts on 23cms (all mode)	SPECIAL PRICE £1699.95

Kenwood V/U Products

TH-F7E	The only 2/70 FM Handie with SSB/CW WB Receiver	£229.95
TM-V71E	First Class 2/70 FM Mobile with remote head	£289.95
TM-D710E	The only 2/70 FM Mobile/Base with APRS/TNC etc	£429.95

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