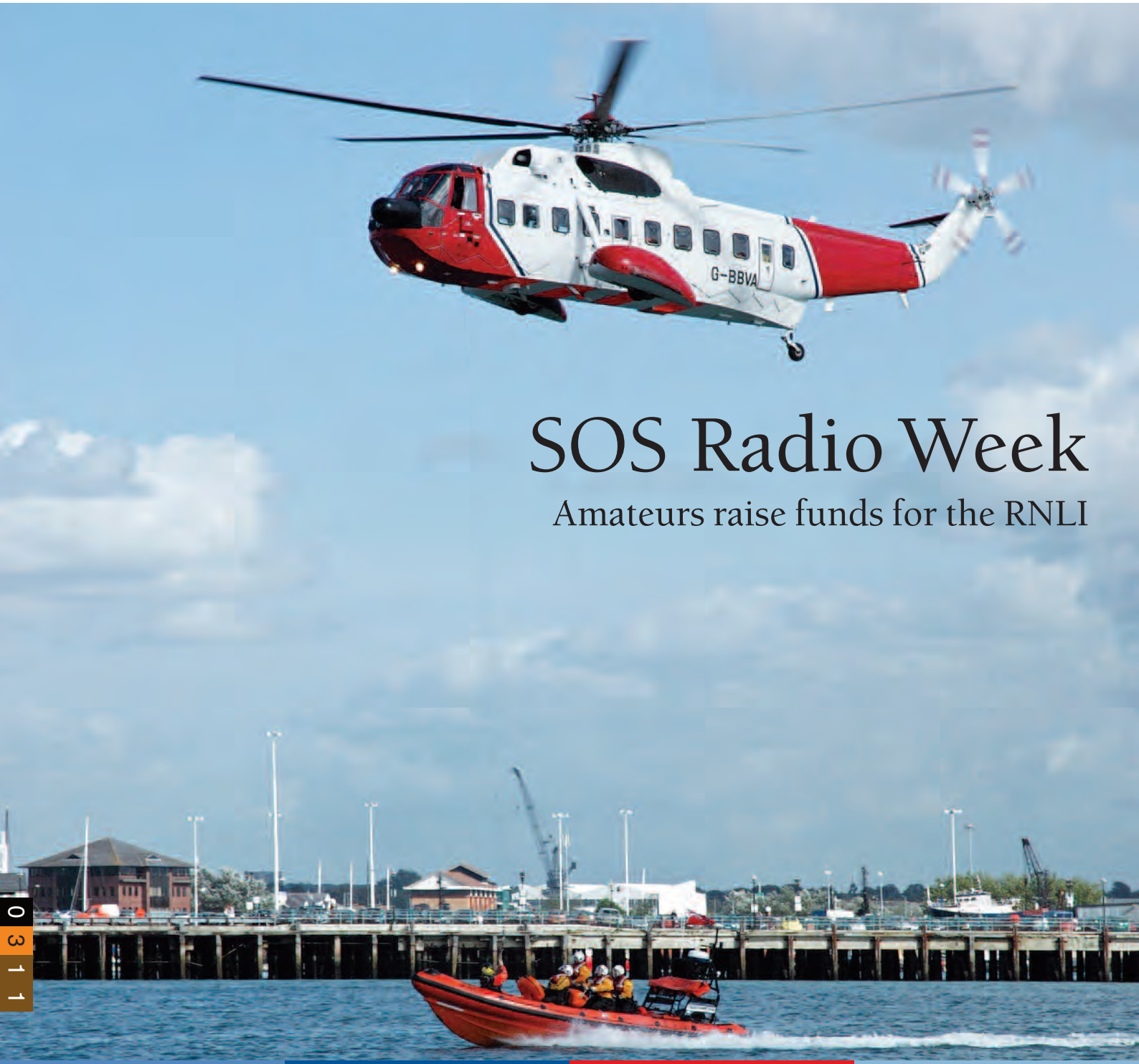
RadCom

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

MARCH 2011
VOLUME 87
NUMBER 03
£4.25



SOS Radio Week

Amateurs raise funds for the RNLI

0311

T32C Christmas Island

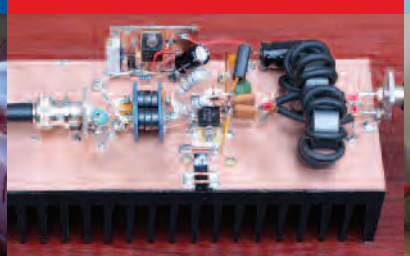
Preview of this major FSDXA DXpedition

Light Comms Special

In GHz Bands plus the start of a major new article

Homebrew Transceiver

Class A linear amplifier



Plasma Televisions

Results of the Plasma TV Survey revealed

WATERS & STANTON

UK's Lowest Prices!

Orderline
01702 206835

Online Catalogue
www.wsplc.com

KENWOOD Amazing TS-590S!

"equal to the best radios available, but at a fraction of the price"
says RadCom Review Jan. 2011.

160m - 6m with superb receiver inc. dual roofing filters, Auto ATU, 32 bit f/p DSP & USB PC connection. **£1369.95 D**

NEW TH-D72E *JUST ARRIVED!*

The very latest handheld from Kenwood is a dual bander with GPS, APRS and TNC capability. The TH-D72 has a built-in SiRF Star III GPS receiver and its antenna, so that you can enjoy various GPS functions with the radio stand-alone. You also can output its GPS data (NMEA-0183) to a PC through the USB port. You can even operate dual receive on the same band.

£426.95 D

TS-480 Transceiver *GREAT PRICES!*

TS-480SAT	HF-6m 100W with remote head & ATU	**£779 D**
TS-480HX	HF-6m with remote head and 200W!	**£879 D**

TS-2000 Series *GREAT PRICES!*

A great choice for everything in one box from HF-70cms!

TS-2000E	100W 6m/2m/70cm + DSP & ATU	**£1549 D**
TS-2000X	As Above + 23cm 10W	**£1799 D**

VHF Mobiles & Handhelds

TM-V71E	Dual band mobile with echo link	**£299.95 D**
TM-271E	2m FM with mighty 60W output	**£169.95 D**
TM-D710E	Dual band mobile 50W with APRS	**£449.95 D**
TH-F7E	2m/70cm 5W SMA +FREE Clip Mic	**£234.95 D**
TH-K2E	2m 5W 4-Key Keypad SMA + FREE Headset	**£164.95 D**
TH-K2ET	2m 5W 16-Key Keypad SMA + FREE Headset	**£174.95 D**
TH-K4E	70cm 5W SMA + FREE Headset	**£164.95 D**

YAESU VHF Mobiles & Handhelds

Exclusive Mobile Offer! Get a free extension cable kit with most mobile models!

^ FT-1900E

FT-7900 + FREE Separation Kit YSK-7800

^ FT-7900E

FT-8900 + FREE Separation Kit YSK-8900

^ FT-8900R

YAESU HF Transceivers

The Fabulous FT-5000

Now with 136kHz Modification!

Get £50 Heil Gift Voucher
With any FT-5000 purchased before end of February.

MORE EXCLUSIVE YAESU OFFERS BELOW!

FT-DX5000	**Basic Transceiver HF-6m 200W**	**£4339.95 D**
FT-DX5000D	**With Station Monitor SM-5000**	**£4795.95 D**
FT-DX-5000MP	**With Station Monitor & Roofing Filters**	**£5295.95 D**

FT-450

NEW FT-450D with 300Hz CW Filter Now In Stock!

Amazing value for a base station. You get 100 Watts with variable IF bandwidth and even a 10kHz roofing filter. **For an extra £80 we will include the ATU!**

FT-450 **£639.95 D**
FT-450D **£799.95 D**

FT-2000

FT-2000 + MD-200 Base Mic ½Price £105! & SP-2000 ½Price £75!

This radio needs no introduction. Covering 160m to 6m, it is the favourite of contesters and DXpeditions. Available as 100 Watt or 200 Watt version.

FT-2000 **£1995.95 D**
FT-2000D 200W **£2599.95 D**

FT-950

FT-950 + MD-100 BASE Mic for £69!

The FT-950 is an advanced class base station transceiverinc 6m, 3 roofing filters and intennal ATU.

£1199.95 D

FT-857D

FT-857D + FREE Separation Kit YSK-857

FT-857D - Mobile transceiver.or base station, this compact radio with detachable front panel. Up to 100 Watts output and coverage from 160m - 70cms, makes this a great buy.

£779.95 D

FT-817ND

The 160m - 70cm radio that fits in your brief case. Includes battery & AC charger.

£499.95 D

FT-817 + FREE CASE

FT-897D

The portable 100 Watts radio from 160m - 70cms.

£499.95 D

FTM-350E	NEW LOW PRICE 2m/70cm Mobile + Bluetooth	**£479.95 D**
FTM-10SE	50/40W 2m/70cms stereo FM Mobile for motorbike	**£309.95 D**
FT-1900E	NEW 2m Mobile 65W	**£129.95 D**
FT-2900E	NEW 2m Mobile 75W	**£139.95 D**
FT-7900E	NEW 2m/70cm Dualband Mobile 50/45W **+ FREE YSK-7800**	**£239.95 D**
FT-8800E	Dualband Mobile 50W / 30W	**£329.95 D**
FT-8900R	10/6/2m & 70cm Mobile **+ FREE YSK-8900**	**£369.95 D**
VX-3E	2m / 70cm Handheld Wideband receive **+ FREE Case**	**£159.95 D**
VX-7R	Waterproof dualband handy (silver / black) **+ FREE Case**	**£289.95 C**
VX-6E	2m/70cms handy, 5W Wideband Receive **+ FREE Case**	**£239.95 C**
FT-60E	2m/70cms, 5W handy Wideband Receive	**£179.95 C**

QUANSHENG *FROM CHINA*

TG-UV2 2m/70cm Dual Bander

The TG-UV2 is a dual band 2m/70cm handheld. It covers 136.00 - 173.995 - 400 - 469.995MHz and FM broadcast 88-108MHz. The radio includes 7.2v 2Ah Li-ion battery for extended life. You also get a built-in LED torch and the option to program you radio from PC based software.

* *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*

Accessories

Car Charger	£9.95
Case	£9.95
Program Cable	£19.95

NEW

Amazing Dual Band Value!
£81.95 D

YouKits *FROM CHINA*

W&S Appointed sole distributors of the first YouKits HF Transceivers

HB-1A-MK3 5W Transceiver

NEW

HB-1A-MK3-40-20 40m / 20m Model
HB-1A-MK3-30-20 30m / 20m Model

Completely self-contained CW transceiver with LCD digital readout and great performance - Look at the Price!

£199.95 D

Provisional Specification:

40 & 20m or 40 & 40m (2 models)

	Full band coverage
Tx: CW	**Rx:** SSB CW & AM
Filters	Crystal for CW & SSB
Keyer	Built-in
Power Out	3W dry cells
	5W 13.8v
Memories	20 Channels
Volts	9 - 14V
Current	Tx 950mA max on
	Rx 55mA
Internal	8 x AA cells
External	13.8v
Tuning Steps	100kHz - 10Hz
Size	140 x 95 x 35 (mm)
Ready Built	

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

WATERS & STANTON
Head Office & South
Spa House, 22 Main Road,
Hockley, Essex, SS5 4QS.
Enquiries: 01702 204965
Fax: 01702 205843
Email: sales@wsplc.com
Opening Hours:
Mon-Sat 9am-5.30pm

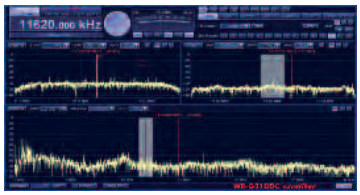
JAYCEE
Scottish Store W&S @
Jaycee, 20 Woodside Way,
Glenrothes, Fife, KY7 5DF.
Phone: 0845 5050128
Fax: 01592 610451
Email: jayceecoms@aol.com
Opening Hours: Sat 9am-4pm
Tue-Fri 9.15am-5pm Closed Monday

Fast Same Day Despatch Service!
Orders Received Before 3pm

Buy Now Pay Later Available!

Get The Latest News First
Follow @wsplc on twitter!

WiNRADiO WR-G31DDC "Excalibur"
Receiver 9kHz - 49.995MHz



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

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 reproduced. Serious DXer or casual operator, you will be amazed. **£649.95 D**

Turn That Old Gear into CASH!

We're Bringing The Cost Of Ham Radio Down!

VAT's gone up, prices are up & you want a new piece of gear?

We can help you out!

We will take most ham related items from working transceivers to "boat anchors" to sundry accessories. Turn your cupboards out and turn it into cash.

Call us on 01702 203353
or e-mail sales@wsplc.com

MFJ *The World's Largest Range Of MFJ!*

"The World's Best Auto ATUs Buy with Confidence! Just Press PTT You're TUNED!"

MFJ-998 AUTO TUNER
**Digital & Analogue x-needle VSWR*
**1.5kW SSB & CW *1.8 - 30MHz*
**20,000 memories*
**Built-in antenna selector*
**Auto bypass protection*
W&S £664.95 C

MFJ-929 AUTO TUNER

1.8-30MHz 200W, LCD readout, 20,000 memories, long wire & coax, radio interface.
A great Auto ATU that needs just a single coax feed and 12V DC. Press the PTT and you are tuned! **W&S £214.95 C**

MFJ-925 Compact auto tuner	£174.95 D
MFJ-927 200W remote auto atu	£254.95 D
MFJ-928 Basic auto atu	£203.95 D
MFJ-931 Artificial ground	£114.95 C
MFJ-932 Mini loop tuner	£143.95 C
MFJ-934 Artificial ground + ATU	£204.95 C
MFJ-935B Portable loop system	£204.95 C
MFJ-945E Mobile atu 300W	£134.95 C
MFJ-991B Auto atu 150W	£214.95 D
MFJ-993B Auto atu 300W	£254.95 D
MFJ-994B Auto atu 600W	£349.95 D
MFJ-962D 1.5kW ATU	£299.95 D
MFJ-969 160m - 6m 300W	£219.95 D
MFJ-971 Portable atu	£122.95 C
MFJ-974B Balanced ATU 3.5-30MHz	£194.95 D
MFJ-986 3kW differential tuner	£359.95 D
MFJ-1625 Window Ant + Tuner	£204.95 D
MFJ-16B01 Dipole centre SO-239	£22.50 A
MFJ-16C06 6x dog-bone insulators	£5.50 A
MFJ-16E01 300Ω end fed SO-239	£10.95 D
MFJ-1796 40m-2m vertical	£244.95 D
MFJ-1798 80m-2m vertical	£309.95 D
MFJ-1908H 43ft fibre glass mast	£244.95 D
MFJ-1922 Digital screw driver control	£101.95 D
MFJ-1924 Prog. screw drvr control	£132.95 C
MFJ-1925 ATAS-100 controller	£74.95 C
MFJ-202B Receiver noise bridge	£82.95 C
MFJ-250X 1kW dummy load (x-oil)	£56.95 C
MFJ-260C 300W dummy load	£45.95 C
MFJ-261 100W dummy load	£33.95 C
MFJ-265 2.5kW load fan cooled	£209.95 C
MFJ-403 Micro CW keyer	£67.95 C
MFJ-403P Micro travel iambic	£82.95 C
MFJ-4103 PSU for FT-817	£53.95 C
MFJ-417 Pocket morse tutor	£77.95 C
MFJ-442 Slim electronic keyer	£204.95 C
MFJ-461 Pocket morse reader	£101.95 C
MFJ-4726 6-way remote ant switch	£164.95 C
MFJ-490 Memory keyer + paddle	£249.95 C
MFJ-495 Memory keyer	£192.95 C

West Mountain RADIO

RB/PP USB Interface

The USB Data Jack Plug & Play is the simplest RIG-blaster. Allows operation on all bands & modes while supporting proper mic operation. Adaptors are required for most radios priced £10.95. **£119.95 C**

RB/PL RigBlaster Plus

Modes: CW, RTTY, AMTOR, PACKET, PSK31, STREAM/HELL
* Serial or USB output
* CD -ROM with software
* Supply 10-16V DC
* Size 135 x75 x 34mm
Included: CD-ROM, USB cable, RJ-45 to 8-pin mic. cable, 2 x audio leads 1.5m long with 3.5mm stereo plugs, 12V DC Power lead plus instruction booklet. **£164.95 C**

Info: www.westmountainradio.com

Tigertronics
New Delivery Expected!

SignaLink USB

* FCC Class B Certified
* Built-in Low-noise Sound Card
* Simple Installation and Setup
* Complete Radio Isolation
* USB Port Powered
* Works with virtually ALL Radios
* Uses Mic, Data, or Accy Port
* Supports virtually All Soundcards
* Digital and Voice Modes

SL-USB-13PDI	13 pin DIN for Icom	£94.95 C
SL-USB-13PDK	13 pin DIN for Kenwood	£94.95 C
SL-USB-5PD	5 pin DIN cable	£89.95 C
SL-USB-6PMD	16 pin mini DIN	£89.95 C
SL-USB-8PD	8 pin DIN cable	£89.95 C
SL-USB-8R	8 pin round mic cable	£89.95 C
SL-USB-NC	Unterminated radio cable	£89.95 C
SL-USB-RJ-11	Terminated RJ11 cable	£89.95 C
SL-USB-RJ-45	Terminated RJ-45 cable	£89.95 C

SP-170F Mobile Speaker with Filter

Mobile communications extension speaker with filter
** 8 Ohms*
** Power rating 1.5W*
** Variable volume control*
** Switchable filter*
** 3m of lead*
** 3.5mm mono jack plug*
** Adjustable mobile mount*
** Size 97 x 67 x 27mm*
** Weight 189g*
£12.95 A

HEIL SOUND *Bob Heil's Pro-Set-6*

The new Pro-Set-6 headset offers a complete new way of operation with its comfortable headset and adjustable boom mic. giving hands-free operation. But why the Pro-Set 6?

Many of todays modern radios now have EQ (equalisation) controls which allows you to finely tune the mic. preamplifier audio response to match your voice and your method of working. Bob Heil recognises this and has designed a wide response mic. insert that gives you the freedom twiddle those knobs in your transceiver and adjust the response to suit your needs.

Pro-Set-6	£144.95 C
AD-1 Rig adaptor leads	£18.95 C

Yaesu HF Linear Amplifier

Yaesu QUADRA Bargain!

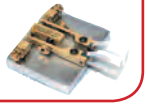
1kW Solid State
This amplifier is in immaculate condition, and boxed. It has had very little use and comes just as it would from the factory. If you are looking for a solid state linear that gives 1kW with ease and quietly, this may be what you want. **SAVE £900** on new price!
ONE ONLY! **£3499 D**

Vibroplex Morse Keys


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



Butternut Vertical Antennas


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

HF-2V 80, 40m DX vertical. 9.75m, Easy erect. **£299.95 D**
HF-6V 80,40,30,20,15,10m self support 7.9m **£399.95 D**
HF-9V As HF-6V but adds 17,12 & 6m. 7.9m **£449.95 D**

Watson Cross Needle Meters


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*

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

WATERS & STANTON

Present

ICOM

Orderline
01702 206835

Online Catalogue
www.wsplc.com

Part Exchange That Old Radio - Even Dead Ones!

That's right - we will even take ham radio items that are faulty or dead! 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 *HF 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.

£3199.95 D

IC-7200 *HF 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. Ideal for field operation or at home in your shack & is designed to be one of the most practical rigs available.

£839.95 D

IC-7700 *HF Transceiver*

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

£6239.95 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 *HF 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.

£1189.95 D

IC-E92D *VHF/UHF Handheld 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.

£384.95 D

IC-718 *HF Transceiver*

£539.95 D

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.

IC-7800 *HF Transceiver*

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

£8999.95 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 *VHF/UHF Mobile*

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.

£439.95 D

IC-E2820 *VHF/UHF Mobile*

The IC-E2820 dualband mobile 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 new features include diversity receive capability, a full dot-matrix display & 50W output power in both VHF & UHF bands.

£499.95 D

IC-E80D *Handheld*

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.

£324.95 D

IC-E90 *Handheld*

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

£244.95 D

Other Radios

IC-910H	Dualband + Optional 23cm Satellite Trnscvr	**£1299 D**
IC-910HX	Dual Band + 23cm Satellite Transceiver	**£1549 D**
IC-2200H	2m FM mobile 65 Watts	**£229.95 D**
IC-R3	Scanner with TFT Colour Display	**£399.95 C**
IC-R6	Handheld scanner 0.1-1309.995MHz	**£179.95 C**
IC-R20	Scanning Wideband Receiver	**£399.95 C**
IC-R1500	Comms Rcvr 0.01-3299.999MHz	**£519.95 C**
IC-R2500	Dual Communications Receiver	**£649.95 C**
IC-R8500	Comms Receiver 100kHz - 2GHz	**£1439.95 D**
IC-R9500	Comms Receiver 0.005 - 3335.000MHz	**£10999.95 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

HF/VHF/UHF + D-Star Transceiver

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

Due In Soon! **£TBA**

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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

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

RSGB ADVERTISING:
KIM MEYERN

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

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

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

RadCom is published by the Radio Society of Great Britain as its official journal and is sent free and post paid to all members of the Society. **The April issue of *RadCom* is due to be delivered by 19 March.**

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

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

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

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

RSGB MEMBERSHIP
– Annual Rates from 1 January 2011

Full membership £51.00
(individual & club)
Family membership £60.00
Paying by Direct Debit saves £4 on the rates above.
Student (21-25) . . . . . Free
Ham Club (under 21) . . . . . Free

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

P&P on RSGB orders:
£1.95 for 1 item, £3.50 for 2 or more items. Different postage rates may be available online. Overseas rates on request.

SOS Radio Week – amateurs raising money for the Royal National Lifeboat Institution

News and Reports

Reviews

5 Star DXers are off again – P79

Features

Rebuilt several times – Antennas, P32

Technical Features

Regulars

A GPS you can use in ARDF! - P78

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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

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

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

BOARD OF THE SOCIETY
PRESIDENT
Dave Wilson, M0OBW

MEMBERS
D Beattie, G3BJ
P Brooks, G4NZQ
L Butterfields, G0CIB
J Gould, G3WKL
C Morrison, GI4FUE
I Phillips, G0RDI
B Reay, G8OSN
J Sneddon, MW0EQL
J Stevenson, G0EJQ

REGIONAL MANAGERS
L Paget, GM0ONX - Region 1
D Morrison, GM1BAN - Region 2
K A Wilson, M1CNY - Region 3
H Scrivens, G0UGE - Region 4
Vaughan Ravenscroft, M0VRR - Region 5
M Harper, MW1MDH - Region 6
J Sneddon, MW0EQL - Region 7
P Lowrie, MI5JYK - Region 8
A Johnston, G8ROG - Region 9
G Keegan, G6DGK - Region 10
P Helliwell, G7SME - Region 11
Neil Whiteside, G4HUN - Region 12
J Stevenson, G0EJQ - Region 13

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

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

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

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

Website: www.rsgb.org
Members Area: www.rsgb.org/membersonly
Log-in using your callsign in lower case as the user name, and your membership number without the leading zeros (see *RadCom* address label) as the password.

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

Your Regional Council

In January, the RSGB's Regional Council held their first meeting of 2011. The council is made up of all the Regional Managers, although a Deputy Regional Manager may represent an RM at the meeting if they cannot attend.

So who are the Regional Managers and what do they do? The RSGB's Regional teams are the front line point of contact for amateurs within the UK who need the assistance of the RSGB. The UK is split into 13 separate regions and details are on the RSGB's website under Local Info or can be found in *RadCom* each month. Do you know who your Regional Manager is? They can be contacted easily and the details are on the Regional websites.

Regional Council meetings are held at least three times a year and they also meet twice a year with the RSGB's Board to form the National Council. Sadly, in January, the weather prohibited the attendance of the two Scottish managers but everyone else was able to get to the meeting.

WHAT'S TALKED ABOUT? Discussions are wide and varied and the meeting includes the RSGB President and/or the RSGB General Manager. At the last meeting, Mark Harper, MW1MDH was co-opted as Regional Manager for Region 6 as no volunteer had come forward at the recent election. The new Regional Rep, Neil Whiteside, G4HUN, Region 12 was welcomed to the meeting.

Peter Lowrie, MI5JYK was elected as Chairman of the Regional Council and Mark Harper, MW1MDH was elected Secretary. The work of Harold Scrivens, G0UGE and Gavin Keegan, G6DGK over the last couple of years in these positions was acknowledged at the meeting.

The Regional team is also represented at Board level and Jim Stevenson, G0EJQ and Jim Sneddon, MW0EQL were elected to those positions.

The meeting is also a place for the Regions to pass on and discuss events within their area. During the discussion on the Morse Assessment, Region 11 Representative Pam Helliwell, G7SME noted that some ten Morse Assessments had taken place in that region. Four tests had been completed at the National Hamfest last year too. It was decided to continue the current series of tests.

IN THE FUTURE. Over the coming months, details of the Regional team's activities will appear in *RadCom*. This will give the membership chance to see what goes on behind the scenes – perhaps encouraging others to volunteer.

Train the Trainers

A Train the Trainers day is being organised for 19 March at the Carman Centre, Helensburgh. The purpose of the Train the Trainers course is to offer tutors some guidance on running courses and teaching techniques.

Provisional Agenda
Start 10am finishing approximately 6pm
Session 1: Background and essential rules etc. – this is the 'must do stuff' to keep the exam legal.
Session 2: Some technical questions – more to get attendees thinking about what they know. The intention is not to 'test' instructors or show them up if they don't know the answers. Questions are not directed at individuals and no one is 'targeted'. At worst, instructors may decide they need to 'brush up' a few areas or seek help in a few places.
Lunch: Approximately 12.30pm for around 45 minutes.
Session 3: The teaching & learning process – this is intended to give non-teachers a grounding in teaching skills and provide a chance for attendees to share their ideas. Q&A (questions encouraged on an 'as we go' basis).

If you are or wish to be a Registered Instructor and wish to attend contact GM0ONX@RSGB.org.uk or call 01563 534383 for further details.

Honour Roll

In last month's Honour Roll, details of Radio Club membership of the RSGB was accidentally omitted, for which we apologise. On 31 December 2010, the following clubs showed continuous membership of the RSGB for the durations listed.

76 Years	Coventry ARS
63 Years	Sutton & Cheam RS
62 Years	Stoke-on-Trent ARS
	Derby & DARS
60 Years	West Kent ARS
	Dorking & DRS
59 Years	Shefford & DARS
58 Years	York ARS
54 Years	Bury RS
	Medway ARTS
53 Years	Crystal Palace Radio Elec Club
	Newbury & DARS
52 Years	Southport & DARC
	Clifton ARS
51 Years	RS of Harrow
	Conway Valley ARC
50 Years	South Birmingham RS

CONGRATULATIONS

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

60 years

Mr H C Young	G3HIA

50 years

Mr J F France	G3KAF
Mr J G Walford	GM3POT
Mr R J Parsons	G3RBP
Mr M J G Dawson	G3TCL
Mr S R Turner	G3UJI
Mr M E Kensdale	RS23278

Do you have legal skills?

The Society is in need of some help in the area of legislation concerning EMC and related matters in the UK and European context. This person would be invited to join the EMC Committee, either as a full member, a corresponding member or a consultant. We need to further build our 'in-house' strength on European and UK legislation particularly as it applies to the technologies involved in radio communication and EMC matters.

If you are a qualified lawyer (current or retired) and feel you can help the team looking at this, or if you know of someone who might be willing to offer some help, please contact the RSGB Director responsible, Don Beattie, G3BJ on g3ozf@btinternet.com or phone 01694 781 666.

RSGB AGM

Join us in Derby for the RSGB 2011 AGM. It will take place on Saturday 16 April at the Menzies Mickleover Court, Etwall Road, Mickleover, Derby DE3 0XX. The whole day is geared to bringing the RSGB to you and is an ideal opportunity for local clubs to socialise and meet with each other and meet with senior RSGB officers.

The timings for proceedings are:

11am:	AGM Registration
12 noon:	Annual General Meeting - Formal Proceedings
1pm:	End of Formal Proceeding
1-2pm:	Lunch
2pm:	Open Forum
4pm:	End of Open Forum

Further details and the Calling Notice will be in the April *RadCom* and on the RSGB website.

QSL Matters

DESPATCHES. Writing at the end of January, we are just getting back to some normality with 10kg packages leaving for Germany, Croatia, France, Slovenia, Switzerland and the Ukraine. 5kg, or smaller, packs went to Chile, Cuba, South Africa and Uruguay. It was 10 days into January before our courier cleared the festive backlog and around 90,000 cards have already gone to UK stations.

SPECIAL EVENT MANAGER. The Special Event series manager Davina, M0LXT is frustrated by GB stations that send cards but never collect the replies. This can run into thousands of cards for clubs and individuals that activate multiple GB calls. In the opposite direction, some eventers don't appear to send any cards. Recently, she had an enquiry from a frustrated DL suggesting UK stations not collecting their cards should be banned – do they do that in Germany?

PORTABLE OPERATIONS. Sub managers in all regions would like to bring to your attention the cards for stations operating out of area. Apparently, the worst offenders appear to be club callsigns or single ops on holiday making just a few contacts.

It's difficult to know that a Welsh club operated from Scotland or an English club from Jersey 2 or 3 years after the event. Some calls appear to move around so much and the re-direct callsign manager's change so often that we are often at a loss to spot where cards should be. Faced with two similar cards, say GM4/P or /A is it local or a visitor? Some choose not to use a suffix at all, making sub managers' lives very difficult.

Too often these cards go out and then come back for re-sorting, slowing us down. Managers say "enjoy your operating, but please do the right thing as the Yearbook suggests – send SAE's to the manager for the actual callsign in use and don't rely on vias". Strictly speaking, volunteers can destroy uncollected cards after just 3 months but hate to do so. Please help them to resolve this growing problem and collect your cards direct from where you operated from.

DETAILS WITHELD. Managers often call us trying to find those listed as, 'Withheld at Licensees request'. In some cases contact details can be found at QRZ.com, in other cases they are not. If this is you, please help by providing your manager with contact details, or tell them that you don't collect.

SUB MANAGER CHANGES. The G7 sub manager, Martin Forrester, G7JWR has moved. Please check his new address on the RSGB website member's area before sending your C5 size SAEs to collect cards.

MM3 & MM6 licence holders are advised that their sub manager, Ray Simpson, GM7NZI is stepping down and our thanks go to him for his service to his fellow amateurs. These two groups are being consolidated with MM1 and MM5 calls, under the guidance of long-time manager Brain Shearer, MM1HMV. All outstanding cards and envelopes are being transferred, but all new envelopes should now be sent to him – details on the RSGB website or via e-mail from qsl@rsgb.org.uk.

DRM for Region 11

There is a vacancy for an RSGB DRM in Region 11. Volunteers must live in Devon, have a phone and a computer with internet access. Could anyone interested please contact Pam Helliwell, G7SME, by email to G7SME@rsgb.org.uk. Please send your phone number so Pam can ring you to discuss the role.

Welcome

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

Mr M Ibbett, 2E0BYB
CAW Dodgson, 2E0CAD
Mr D Mathewson, 2E0IOG
Mrs C Mathewson, 2E0MTC
Mr T Goh, 2E0TSG
Mr D Woodhouse, 2E0UIP
Mr MC Raynor, 2E0VAT
Mr WEL Easdown, 2E0WEL
Mr RS Ewing, 2M0BSE
Mr F Dominguez, EA1CNV
Mr P Pollock, EI8JT
Mr D Sholdice, EI9GFB
Mr J Coutarel, F6HOY
Mr M Lawrence, G0GGX
Dover AR Construction Club, G0ROO
Mr J A Gordon, G4LIA
Mr Brian Oakley, G4PBJ
Mr MP Stevens, G7SFA
Mr S Furminger, G7TYH
Mr A Faulkner, G8WXV
Mr M J Meadows, GW4GUG
Mr F Claudio, IZ1DNJ
Mr M Bell, M0DLS
Mr R ONeil, M0EEC
YP Pokern, M0GVH
Mr D Lyon-McKeil, M0GVK
Mr W Gaye, M0GYE
Dr W Rogalski, M0OSH
Mr R Pearson, M3PWZ
Mr J Smith, M6AEY
Mr F J Soden, M6AKD
Mr B Smith, M6AKI
Mr A Millin, M6AKT
Mr SM Hassall, M6ALQ
Mr VL Leppard, M6AMF
Mr J Graham-Cumming, M6ANJ
Mr A Blamire, M6AXB
Mr CF Bell, M6DTY
Mr J Lavery, M6EAJ
Mr BJB Blackstone, M6GTM
Mr J Cleeter, M6JAZ
Mr MV Rusu, M6LGL
Mr M Bailey, M6MBF
Ms N Saville, M6MOG
Mr P Colyer, M6PCZ
Mr SA Jeffery, M6SBB
Mr S B Pascoe, M6SBP
A Burton, M6SQL
Mr WD Hand, M6TCL
Mr R Smith, M6TMA
Mr S G Crabb, M6TZY
Mr W J Jones, M6WRJ
Risca & District ARS, MC0RRD
Mr AW Ruddell, MI6AJN
Mr RS Barrie, MM6AIX
Mr AT Sampson, MM6CGO
Mr R Cormack, MM6JUE
Mr AR Bryan, MM6RFU
Mr NE Howells, MW0JLN
M Vuohelainen, OH5VM
Mr P Coonen, ON2PCO
Mr EB Madsen, OZ8EM
Mr JEA Broere, PA0NOS
Mr R D Beck, RS205402
Mr M Tweedie, RS207420
Mr J C Dunn, RS207425
Mr RT Langford, RS207529
Mr M Sheldon, RS207530
Mr IA McPherson, RS207569
Mr R Goodall, RS207611
Mr D Blowers, RS207614
Mr R Davids, RS207615
Mr P B Mills, RS207618
Mr N Garf, RS207635
Mr P Cardamone, VK3HPC
Mr JM Medley, W4QPX
Mr D Longerbone, W4WIS
Mr W H Rushton, W4ZAA
Mr KS Robertson, ZL1AVO
Mr RW Carpenter, ZL3RO
Schweitzer Sortiment

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

Mr G Stone, 2E0GDX
Mr J Bayliss, 2E0OJB
Mr P Hunter, G0GSZ
Mr R E Deakin, G0HYR
Mr C Brown, G0UNJ
Mr M L Allmark, G1EZF
Mr D Blackman-Wells, G1WXC
Mr DGJ Rouse, G1XDK
Mr C Cartmel, G4EST
Mr J J Wilkins, G4GEA
Dr F A Delaney, G4GKT
Mr G Kearns, G4MYA
Mr S Marchini, G4TOZ
Mr F Hall, G4ZTX
Mr S G Turner, G6LPF
S K Thornber, G6SGA
Mr T P Oakman, G7FOK
Mr JD Craig, G7GMB
Mr G R Bryce, GM3JOB
Mr F D Lord, GW8VGG
Mr N W Johns, M0ASI
Mr C A Robinson, M0BXD
Mr D Gallier, M0CEJ
Mr K Haworth, M0TNX
Mr D Coe, M0VDC
Mr A B Smith, M0VIG
Mr B Ratcliff, M3NHA
Mr B D Silvester, M6ALD
Mr S Quigg, MI0GGB
Mr N J Golds, RS186323
P P Koets, RS194223

Skywarn

Dave Wright, M3TZX contacted Newsdesk bringing the UK's Skywarn project to our attention (www.Skywarn.org.uk). SkyWarn UK offers a free membership structure dependent on the level of involvement you would like to have with the organisation. The membership that is likely to be of most interest to radio amateurs is Spotters. Spotters are expected to take an active role in observing and reporting specific severe weather events. In order to join as a spotter you will need to complete some basic spotter training. This consists of a short presentation / handbook followed by a short test. All the information is available on the website. Dave has been a member for some time and would like to encourage fellow amateurs to join in the research too.

Newbury goes /MM

Various members of the Newbury and District Amateur Radio Society have become involved in running a radio station and signing /MM from onboard the 2009 UK Flagship of the National Historic Ships, the *SS Shieldhall*. This is with full blessing of the Charity running the vessel and the ship's Captain, Peter Roberts. The ship needs to be promoted more as it may be laid up unless it gets funds for a dry docking due early in 2011. The Newbury Club did wonders for the Vulcan last year so some members have volunteered to help the *Shieldhall*.

The first day's operation was on Sunday 16 January when 156 contacts appeared in the log during a 5 hour period operating. A G5RV was run between the masts, which gave excellent results. There are plans for more operations in the near future, mostly at weekends, but exact dates are not yet known.

The photograph shows the steamship *Shieldhall*, a 1792 gross tons, 268 x 44ft twin screw ship. In 2009 it became Flagship of the National Historic Ships. It is the largest working steamship in Northern Europe.

GB1YDD

During the month of December the Yorkshire Dales Contest Group operated GB1YDD for a combined Yorkshire Dales Day on The Air and World Flora and Fauna reference GFF-020. The station was located close to Malham Tarn in the Yorkshire Dales, over 1000ft above mean sea level.

During 18 hours of operation from Saturday afternoon to Sunday evening, the crew consisting of Andy, M0GGR, Chris, 2E0XLG, Andrew, G7COD, Ian, M0IAA and George, M3VBP worked a total of 500 stations. Despite poor propagation conditions on HF they averaged one contact every two minutes on four continents. The best DX was YN from Nicaragua.

They enjoyed calm winds and no snow showers, however outside air temperatures remained sub-zero for the majority of the activation. The operators would like to thank all stations who contacted them during the event. QSLs are via M0OXO.

New Welsh Radio Club

Risca & District ARS has just been formed and the inaugural meeting took place in January. Despite torrential rain many members were able to make it to the first meeting. They now meet every Thursday evening from 7 to 9pm at Risca Leisure Centre, Risca. New members are welcome and the club hope to start exam courses in the near future. Enquires to Brian on 01633 612710 or Clive on 01495 309954.

Doug, GW6RAO made some 2m contacts via the GB3WR repeater.

Kempton Rally

The Kempton Rally will take place on 17 April at Kempton Park Race Course, TW16 5AQ. The organisers will be holding a group of technical clinics that are designed to help newcomers and old timers alike. The clinics will be held in the quiet lecture theatre area and will be available all day. The areas covered will be:

- EMC problems and solutions, covering things like TVI and computer interference, with Robin Page-Jones.
- Getting Licensed, how to get started in amateur radio with members of the Whitton ARG.
- Contesting, getting started and improving your results, with Steve Knowles, G3UFY.
- Antenna problems, advice and hints, with Mike Underhill, G3LHZ.
- Home brew problems and other hardware or software issues, with Terry Giles, G4CDY.
- You can also bring in your rig to get a basic health check with Martin Charman, G4FKK. There will be calibrated test gear available to measure things like output power, frequency, deviation and CTCSS set up. Unfortunately, he will not be able to repair, re-align or make internal adjustments to rigs at the rally.

For more information see the Radiofairs website, www.radiofairs.co.uk.

Antenna Engineering

Antenna Engineering offers a range of full size verticals for the HF bands including 5/8 wavelength verticals for 20m, 15m & 10m. They are in the process of developing a new range of 160m & 80m reduced height antennas that will be available in the spring. The range is constantly expanding and builds to customers' own specifications are welcome. All the products can be seen at www.antennaengineering.co.uk.

NEWS IN BRIEF

• Unfortunately there were a couple of errors in the news item on Sheffield ARC in the February *RadCom*. David Middleton should read David Littlewood and Roland's callsign is actually M0NUE. Our apologies to the two gentlemen and the Sheffield Club for the errors.

Zürich HB80Z Award

During 2011, the Zurich chapter of the Union of Swiss Shortwave Amateurs celebrates its 80th anniversary. The Zurich HB80Z can be earned by any licensed amateur or SWL. Each QSO or SWL report with stations residing in the Kanton Zurich (ZH) during the year 2011 counts one point. QSO with /mobile or /portable stations are also valid, if the station is within the boundaries of Kanton Zürich (ZH) during the QSO.

EU & DX stations need 5 points to qualify for the award. A QSO with the Club station HB80Z is not required, but counts as 2 points. The award can be worked in all modes and on all amateur bands. Each mode will be numerated separately (phone / CW / mixed / VHF-UHF). To get your award please send a list of QSLs, signed by two amateurs with the fee of €10 or US$13 at least by end of 2012 to USKA Sektion Zurich Award Manager, Rolf Peter, HB9MHR, Zelglistr. 16, CH-8602 Wangen ZH, Switzerland.

ITU Forum

The ITU Forum on Technical Compatibility between Power Line Telecommunication systems and Radiocommunications services takes place in Geneva in May. The Forum will discuss the potential interference effects of PLT technology into the radio frequency spectrum in light of the latest technological PLT developments that touch the radio spectrum up to the frequency ranges used in homes for broadcasting reception. Mitigation techniques need to be developed and standardisation efforts are necessary to overcome these technical challenges.

Peter Chadwick, G3RZP, IARU Representative, will be presenting a talk on what radiocommunications stakeholders should do.

NEWS IN BRIEF

• M0CVO Antennas will be appearing at the Horncastle Winter Rally, the Dambuster's Radio Rally (Coningsby), the Spalding Rally and the National Hamfest. www.m0cvoantennas.co.uk.

More Exam Success at Sutton & Cheam

The Sutton & Cheam Radio Society is continuing its cycle of training courses and has recently hosted the Advanced exam and a Foundation course. The 2011 Intermediate course got under way at the start of January with the exam scheduled for mid March. Congratulations go to Andrew, M6AXB, Barry, M6BJT, James, M6EMC, Alex, M6AKM, Damian, M6ATZ, Gary, M6GHT, Jonathan, M6JGW, Stuart, M6MCM and Zach, M6ZLP who all passed their Foundation with very good marks.

The Advanced exam was passed by Dee, M0LUG, Alex, M0WOJ, Griff, M0HWS and Colin, M0NLP who had previously passed their Intermediate licence with S&CRS.

New club members are getting involved in training with Neil, M0ZEY joining the rest of the team, Martin, M1MRB, Tim, 2E0TTA, Steve, G3WZK, Denis, M0NDJ, Paul, M0TZO and Darren, M0PRV.

GB1OOD

GB1OOD has been issued for 2011 by Ofcom as a special event callsign. It will be used throughout 2011 to celebrate the 100 years of the Derby Wireless Club, founded in 1911. Until 25 March the station will be operating from the Silk Mill Museum located in the city centre of Derby alongside the River Derwent. The station will have restricted operation – mostly at weekends – due to the museum's opening hours. Information can be found on QRZ.com.

New Radio Club

The inaugural meeting of the Riverway Amateur Radio Society took place in January with 20 founder members signed up on the night. The first proposal voted in after the appointment of the committee was the approval to affiliate the society with the Stafford & Rugeley Sea Cadets. Some of the members had already supported several of the cadets in obtaining their Foundation licences and in the setting up of a shack with VHF/UHF and HF capabilities.

The society meets at the Sea Cadet HQ on Riverway in Stafford every Wednesday at 7.30pm. Although Stafford based, it welcomes members from the amateur radio community regardless of location. If you are interested in joining or finding out more please contact Robert Fullagar, M0RPF, by e-mail to rfullagar@worldonline.co.uk.

Back left is Robert Fullagar, M0RPF Secretary, David Fradley, M0DJF; Front row left to right are L Cpl Bywater, M6JCK, Able Cadet Hodgson, M6BLD and L Cpl Smith, M6SMT.

Fermanagh Repeater Thanks

As thanks for important and valuable services to the Fermanagh Repeater, GB3CP, Raymond Ashe, GI8RLE was guest of honour at Lough Erne Amateur Radio Club's annual winter lunch, attended by over 30 club members, friends and family. The photograph shows LEARC Chairman, Michael Clarke, MI5MTC, Raymond GI8RLE and treasurer Herbie Graham, GI6JPO, whose good work on financial and technical aspects of the Club's repeater project were essential to its success.

GB3CP is a service to all in amateur radio and funded by income from the Lough Erne Rally. The thirtieth rally is in SHARE on 17 April, the Sunday before Easter. The talk-in will make good use of GB3CP's excellent footprint, serving radio amateurs and experimenters mobile in Fermanagh and nearby counties in Northern Ireland and the Republic.

Exam Success

The Midland Amateur Radio Society is pleased to announce another examination pass for their tuition team. Mark Bailey is now M6MBF and other club members are looking forward to hearing him on the air.

Club Celebration

Kilmarnock and Loudoun Amateur Radio Club recently held a dinner in the Broomhill Hotel Kilmarnock to celebrate the 30th anniversary of the club. About 25 members sat down to an excellent meal. After the meal Bill Strachan, GM3ZRT gave an interesting talk on the history of the club, accompanied by a video presentation given by Gordon Stewart, MM0BIM. The club would like to thank Allan, GM3OZB for giving his time arrange the evening.

In the photo Kerry is cutting the cake with Frank, GM6JEP, Jean and Ian, 2M0DOS seated. The club meets every second Tuesday in the EA Transport Depot in Crookedholm. Further details from www.klarc.org.

Photo by MM0GHM

CQWW SSB contest

Kilmarnock and Loudoun ARC were active again in the 2010 CQWW SSB contest as GM7A. Operating in the low power multi single section, the main radio was a Kenwood TS-850S and the multi was a Yaesu FT-840. The antennas used were a 3-element tri-bander for 10/15/20, a 40m vertical, a W3DZZ 80/40 trapped dipole and a Top Band inverted L. The log used was N1MM.

Gordon, MM0GOR operating the main station.

Hastings RCE Students' Happy Christmas

After just 6 weekly sessions with Phil, G3MGQ, all five students passed their Foundation Exam with flying colours at the 1st Brede Scouts' Hut just before Christmas. They've already got the RSGB book to study for their Intermediate licences and Phil, chief trainer for the Hastings Electronics & Radio Club, will be starting an Intermediate Course before Easter for them (and anyone else who contacts him: details under Region 10 Exam Centres). Phil would like to thank chief invigilator, Steve, M0SSR and the Brede Steam ARS for the use of their shack for the practical training, a great example of inter-club cooperation.
Chloe replaces her brother, M3VZA, as the youngest member of the Club.
The Hastings Club gives all its Foundation trainees free membership of the Club for the current year, so that new licensees can sample the variety of amateur radio interests its members enjoy.

Jamie, M6JBS, Chloe, M6SQT, Phil (tutor), Louis, M6LPW, Mike, M6OFC & Wez, M6XUP.

New Advanced Licence holder

Ian, 2M0DOS sat his Advanced exam in December at the Kilmarnock & District ARS and now has the call MM0SOB. The club members wish Ian all the best and good DX with his new call.
Ian wishes to thank the instructors and members of the club who helped him with his studies.

Rear Ian, MM0SOB Front: Len, GM0ONX, Alan, GM0OZB and Frank, GM6JEP.
Photo by MM0GHM.

Foundation Training

In January, Loughton and Epping Forest ARS completed their 18th Foundation licence training course. Trevor Fox, who travelled to Chigwell Row for the weekend from Dorchester, passed the exam along with Charlie John, Ray McKay, Mike Moore, John Sichel, Mark Welland and Cliff Wilson. Enrolment has already begun for the next LEFARS Foundation course over the weekend 2 and 3 April and it is expected that a further two courses will be staged by LEFARS later in 2011. An Intermediate licence practical assessment and exam session will take place in the spring. Anybody interested in participating should contact LEFARS Secretary, Marc Litchman, G0TOC, by e-mail to g0toc@lefars.org.uk.

The attached photo shows, left-to-right: Trevor Fox, Cliff Wilson, Mark Welland, Ray McKay, Mike Moore, Charlie John, John Sichel.

Intermediate Licence Success

After passing the Foundation licence exam in December 2009, school teacher Chris, 2W0CEO, a member of Chester & District Radio Society, spent most of last year working in Lesotho. Immediately after Christmas 2010, he returned to another teaching post in South Africa. However at very short notice before his departure, an Intermediate licence course was arranged, which he passed, gaining a 96% pass mark. He's now back in South Africa.

Regional Manager Kath Wilson, M1CNY presenting Chris with his Intermediate licence certificate.

New Address

After 31 years at Harrop Hall, Mexborough, Mexborough & Distirct ARS has moved to a new home.

The new address for meetings is The Place, Castle Street, Conisborough, Doncaster DN12 3HH. The building is next to the old Police Station and is disabled friendly. Contact details and the usual meeting times of 7pm - 10pm on Friday evenings remain unchanged.

DXer TA3J at Wey Valley ARG

The Wey Valley Amateur Radio Group, based in Guildford, Surrey, has a keen interest in CW operation and contests. Recently the club was approached by a well known DXer planning a whirlwind tour of European clubs and operating from several locations in the UK.

Berkin Aydogmus, TA3J, has been active for many years at his home QTH of Izmir, Turkey and has a large number of DX awards to his credit. He arrived at the club and demonstrated an enormous energy and determination to get on air from Guildford. With a half wave vertical for 40m available, the choice of operating band was obvious and within minutes he was calling CQ on 40m. Conditions were poor that day and QSOs were difficult to make. Nevertheless, a couple of dozen stations were bagged across Europe, although nothing was heard from TA land!

Berkin departed a happy man taking with him the congratulations and best wishes of the Wey Valley club.

Berkin, TA3J, with (to his right) George, G2DBH and Mike, G0EFO.

GB4DXS

GB4DXS was run from Cheshire Scouts County camp site Forest Camp. This wooded area is not the ideal location for an amateur radio station but they have been running a JOTA event from it for the past 4 years. The shack is set up in one of the brick built garages that has mains power and lighting but no heating! For a VHF aerial they use a 10 element Yagi, (it's really 9 elements: one was lost some years ago). To get the best height the beam is mounted on top of the climbing tower, clearing at least some of the trees.

For HF they had been using a long wire strung up between the climbing tower and trees and fed via an ATU. After sending an e-mail to Waters & Stanton asking if they would be able to supply a full size G5RV, W&S kindly send one free of charge. The G5RV was put up between two tall trees. It was a temporary set up as the climbing tower is to be replaced and the G5RV was very close to the tower. The event went very well and seven Scouts from the 42nd Chester all passed their communicators badge. They were George Watts, Archie Armstrong-Sankey, Charis Walton, Hector Dawson, Leon Davis-Tormey, Ben Chaddock and Callun Parkinson.

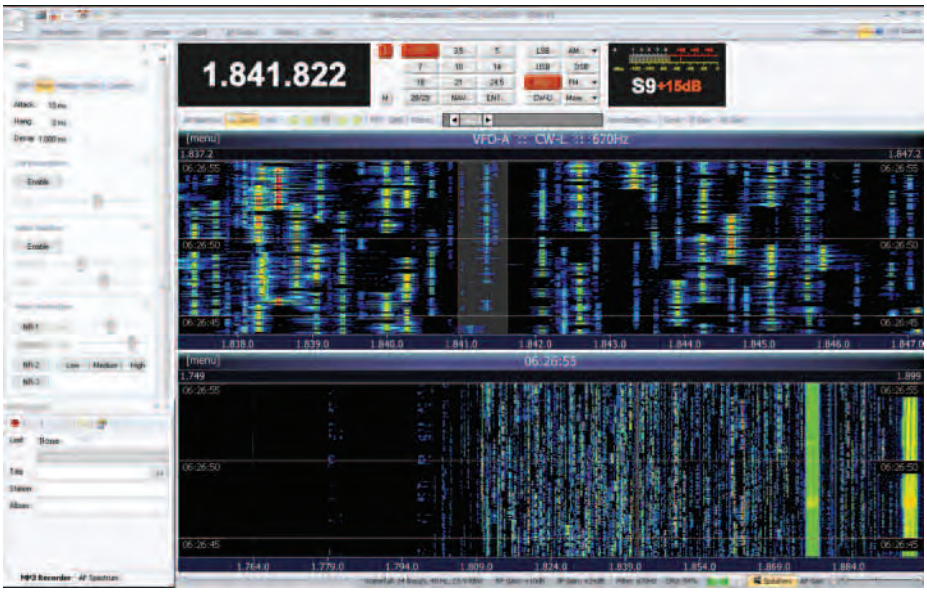
G0DUB with 42nd Chester Scout Troop.

They had also arranged a sked with the Scout Troop Ullern from Oslo in Norway having camped with the Troop at Chamboree 2010 in Cheshire. It all went according to plan and each of the UK Scouts and leaders were able to speak and pass greeting to the Oslo Scout Troop and also to Andre Asbjornsen, the leader. They were using the callsign LA2AB.

The team would like to say thank you to all the stations they made contact with and to the leaders of the 42nd Chester: Steve Shone, Martin Formstone, Andy Armstrong-Sankey and Krissi Asher. Thanks also to Greg, G0DUB for assisting in operating the station, Guy for his help and the use of his rope (which was cut!), and to Chris Hunt and Mike Taylor for helping get the G5RV up. Very special thanks go to Waters & Stanton who donated the G5RV. This has made setting up easier and once it is installed permanently will be available not just for JOTA but any radio Scouting event.

Now THAT'S where an SDR is very useful

Ian Wade, G3NRW, took this screenshot during the recent CQ 160 CW Contest. He was using an SDR-IQ software defined radio from RFSpace, together with the SDR-Radio software from Simon, HB9DRV, of Ham Radio DeLuxe fame. Wall-to-wall CW up to almost 1900kHz, with a few Europeans below 1810kHz as well. With an SDR you can really see the scale of things!



NEW

RSGB shop

SAVE 25% OFF RRP

Most Secret - Orford Ness

from £11.24

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. In between, Watson Watt and his team worked in the 1930s developing the highly secret radar systems that were to prove so crucial in WW2. All manner of ordinance was tested at Orford Ness from hand held WW1 bombs to Barnes Wallis WW2 bouncing bombs, all manner of rockets and missiles and even Cold War Atom bombs (without fissile material). The top-secret UK-US COBRA MIST project was built at Orford Ness with its antenna that alone covered a massive 132 acres. Always at the forefront of military technology from 1913 to the 1990s, Orford Ness was involved in much else as well and readers will find it all detailed here.

This extraordinary book details the story of Orford Ness and the work conducted here by some of the greatest 'boffins' of past generations. 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.

Size 156x254mm, 288 pages, ISBN 9780-7524-5741-3

Non Members' Price £14.99

RSGB Members' Price £11.24

SAVE 25% OFF RRP

TSR-2: Britain's Lost Cold War Strike Aircraft

from £14.99

By Tim McLelland

"Perhaps the best aircraft Britain never built"

The TSR2 is probably the most controversial British aircraft designs of all time and an aircraft whose cancellation still generates comment over 40 years after its abandonment. Surrounded by rumour, speculation and talk of American efforts to shut the project in favour of the General Dynamics F-111, this project was certainly hampered by political indecisiveness, industrial mismanagement and confused defence planning. With hints of today's defence situation this book provides a detailed view of this magnificent aircraft.

Designed to carry forward into the late 20th century, the British nuclear threat, the TSR2 was a highly accomplished aircraft that never saw production. Capable of supersonic speeds with the ability to fly at low level hidden from enemy radar, the TSR2 was at the very cutting edge of technology. Despite prototypes being built and proving it to be an outstanding aircraft, the project was cancelled in 1965 and with it years of dedicated aeronautical research was written off at a stroke.

Illustrated with many mono & colour photos, two colour 4-views, 1:72 scale plans and diagrams, this laminated hardback book is a fascinating record of a great aircraft and a missed opportunity for the British Aircraft industry.

Size 228x306mm, 128 pages, ISBN 9781-9065-3719-7

Non Members' Price £19.99

RSGB Members' Price £14.99

POST & PACKAGING FREE FROM

See page 80 for full details

3 Abbey Court, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496
E&OE **All prices shown plus p&p**

Radio Society of Great Britain
www.rsgbshop.org

Macclesfield & DARS Exam Successes

In November, three members of Macclesfield & District Amateur Radio Society successfully sat their Advanced licence exam. In the photograph are left to right Arthur, M0GWF, Simon, M0TGT and Robert M0ONE.

Their successes were soon followed in December when three Foundation exam candidates were rewarded with early Christmas presents when they all passed the exam. In the photograph are left to right Edward, M6NSR, Tim, M6AMX and Ted, M6DOP.

The courses were run by the club's lead instructor Brian, M0GOB and assisted by Roger M0GMG and Charles, G0LVH.

90 (Speke) Sqd ATC Radio Club

The radio club is intending to have a Radio Day in support of Marie Currie Cancer Research on 5 March. They intend to operate on the HF and VHF bands using SSB and PSK from 10am to 10pm. The special event callsign GB0MAC and club callsign MX0NAC will be in use.

President's Visit

In January, RSGB President, Dave Wilson, M0OBW went to the Chorley and District Amateur Radio Society (who meet most Wednesdays at the Tatton Community Centre, Chorley) and gave the society a very instructive talk about the Radio Society of Great Britain and its workings. All the members found it very constructive and informative and would like to thank Dave very much for his attendance and for giving the club a great insight into what goes on.

4th Bath Buildathon a huge success

For the fourth year on the trot the Bath Buildathon Crew ran a full day's radio construction workshop in January. This year the project was the Walford Electronics Tone superhet receiver modified for 20m. Thirteen builders attended with some travelling from South Wales, the West Midlands and Kent as well as the 'locals' from Wiltshire and Somerset. The youngest builder was Zoe Thomas, M6ZOE, who demonstrated some of the neatest soldering ever seen at the Bath events.

There were the usual 'builder errors' with components going in the wrong places, transistors fitted back-to-front and 'hot' connections inadvertently grounded, but all learned from their mistakes and by the end of the day all thirteen Tones were operational. Unfortunately, the band had closed by the time the receivers were finished so no DX was heard on the day but everyone was very happy with their finished kits.

After the building was finished, five intrepid souls stayed on to complete their Intermediate practical assessments and then sat the written examination. Despite the long day raising solder smoke, all five passed the exam and left with beaming smiles.

This time round, Steve, G0FUW, Mike, G3VTO and Lewis, G4YTN, were assisted by Rob, M0TFO, and Ed, M0OSM, with Dan, M0TGN and Brian, 2E0BGD, overseeing the examination. Well done to all those involved.

Four of builders concentrating on their kits.

Zoe Thomas, M6ZOE, making those neat solder joints with dad, Richard, keeping watch.

Lincoln SW Club

In 1921 the Lincoln Wireless and Scientific Society was formed (it later became Lincoln Short Wave Club). The first meeting took place on 10 February at the Speadeagle Hotel on Lincoln's High Street. It seems strange that on that evening transport was mostly horse drawn, many had not yet got electricity and here were a group of men (yes, they were all male), meeting to discuss instant communications using equipment that they would build themselves that were not connected by wires.

The Lincoln Society started meeting regularly and some of the members with transmitting licences were very active – C W Cottam, 2UL; C H Friskney, 5NT and Ralph Bates, 5ON all being founder members. In the early 20s, Ralph Bates was regularly 'broadcasting' to local people, including the head of music at Lincoln Cathedral singing popular songs of that period.

The club applied for its own licence and was issued with 5FZ. Meetings moved to Lincoln Technical College, where the club met until the 1950s.

Today the club is active in many contests and has G5FZ on the air regularly. A number of special events are undertaken every year and groups of young people hosted at the club. A programme of teaching for all classes of licence is under way with a superb success rate. The club is a Morse testing centre and has a number of keen CW enthusiasts.

To mark the 90th anniversary, the Club will be re-launching The Lincoln Century Award that is awarded to any station or SWL who can score 100 points. Lincoln Short Wave Club Stations G5FZ or G6COL are each worth 30 points; any station in the City of Lincoln, England or any other town or city in the world with the name of Lincoln secures 20 points and any station in the County of Lincolnshire, England or in any Lincoln County in the USA gains 10 points. Full details can be found at g5fz.co.uk under the Awards tab at the top of that page.

QSL collectors will appreciate a special card for contacts through the year. It features a photograph of one of the Club's founders, Ralph Bates, 5OD, operating his home station in 1923.

New British Yagi Company

An 11el 4m LFA installed at G0VHF last year.

In March, Justin Johnson, G0KSC launches InnovAntennas Limited. Justin has become well-known for his LFA (Loop Fed Array) Yagi and OWL (Optimised Wideband Array) Yagi. InnovAntennas will produce a wide range of these antennas in addition to the unreleased OP-DES (Opposing Phase Driven Element System) Yagi that has been specifically designed to cover individual HF bands in their entirety without the need for an ATU.

The InnovAntennas website provides in-depth information on each and every antenna in their range although the team are very happy to discuss any requirements individuals may have - and will pay for the call too! InnvoAntennas can be contacted on freephone 0800 0124 205 or via their website, www.innovantennas.com.

Bath Morse Course

After a successful course that ran in 2010 and with much interest, Steve Hartley, G0FUW and crew have announced more dates for the next Morse code training course. This year the course will run from 30 March until mid June.

Anyone interested in the course will be delighted to know that no knowledge or equipment is required; all you need is a pen, some paper and the enthusiasm to learn the code.

Each week more letters are added to the mix in a proven method thus increasing your Morse knowledge in a steady fashion. Later in the course as you understand the alphabet and numbers more on air etiquette is explored and some fun games are played to allow you retain the knowledge you have gained.

At the end of the course candidates can sit the RSGB competency test at a speed that suits them best. Again this year Assessment will be conducted by Robin Thompson, G3TKF.

The lessons and test all take place at the Scout HQ in Bath. Each meeting is held on Thursday evenings at 7pm. For more information please e-mail Stave Hartley at g0fuw@tiscali.co.uk or call him on 01225 464394

SOTA Mountain Goat

The Summit On The Air's latest Mountain Goats is Allan, MM1BJP from Bonhill on the banks of Loch Lomond. Mountain Goat is awarded to those with over 1000 activator points; points that you can only get by climbing lots of hills! Allan combined his love of hillwalking, his RAYNET activities and a couple of Camb-Hams DXpeditions to the Scottish Isles to build up his tally. Allan can lay claim to at least six first time activations on these DXpeditions alone and eighteen 10-point summits since stating his SOTA challenge.

By undertaking some winter excursions Allan managed to top up his score with over 200 winter bonus points – useful, but hard work to get! In August 2009 Allan managed to get onto Ailsa Craig (GM/SS-246), (see photo, courtesy of GM0AXY), a small island off the coast of Ayrshire which, even at 1 point, is not the easiest summit to activate due to being surrounded by water.

Since he started his SOTAing on 3 August 2002, Allan has managed to climb 200 hills and made over 1800 HF & VHF QSOs.

Latest Passes

Cockenzie & Port Seton ARC are delighted to say that the club has seen more exam success recently. Nine candidates passed their Intermediate exam. Left to Right you can see Scott, MM6LAK, Paul, MM6ANB, Roy, MM3RKF, Bob, GM4UYZ Instructor, Gary, MM6ZIM, Ian, MM6UEN, Richard, MM6JKO, Jenny, MM6MAV, name withheld, missing was William, MM6BLL.

NEWS IN BRIEF

• Radio New Zealand National visited the 9th ZL3 Radio Buildathon and produced a feature on the amateur event. If you would like to listen, the 1.5MB mp3 audio file may be downloaded at http://sites.google.com/site/zl3buildathon/radionzinterview.

Information on the Buildathon may be viewed at https://sites.google.com/site/zl3buildathon.

• If you are planning to visit Cyprus this year, the Pafos Radio Club would like to welcome you. They meet on the 3rd Thursday of each month at the Pafos Gardens Hotel at 7pm. They also have a weekly net on Wednesdays at 7.30pm, on 145.750MHz using the local repeater 5B4PRC. More details from Don, 5B4AGQ .

• QSO365 is a project running throughout 2011 by Keith Maton, G6NHU to have a QSO per day during the year and document the progress on a blog. This is quite a personal challenge because Keith only has limited time each day to operate the radio. As part of the project, Keith is in the process of learning Morse code and has said that he intends to use CW on air during the year. All stations mentioned on the blog throughout the year will receive a QSL card with a sticker on the back mentioning the project and the day that the QSO took place. QSO365 is sponsored by Martin Lynch and Sons Ltd who have kindly provided loan equipment for the duration of the project.

The QSO365 website and blog can be found at http://qso365.co.uk and the project has already been picked up and publicised on the internet.

Intermediate and Advanced Success

Waterlooville ARC have had success with both their recent Intermediate and Advanced examinations. Passing the Intermediate exam (and shown in the photo) is Neil Hoare. L-R Paul Steed (RSGB Inspector), Neil Hoare (Intermediate candidate), John, M0LCD, Gary, M0GMR. The course Instructor was Gerry, G3COO.

Passing his Advanced exam was Oliver, 2E0OLI.

Mike Smith, G4PRG, who is the Examiner and Events Manager for the club, would like Paul Steed and the RSGB staff for their support in these events.

SOS Radio Week

Radio amateurs go on the air to raise funds for the RNLI

What SOS Radio Week is all about, raising funds for the RNLI.

SOS RADIO WEEK. This event isn't a contest; groups or individuals go on air as much or as little as they choose raising the profile of the Royal National Lifeboat Institution as well as raising funds at the same time. 2011 was the fifth year for this nationwide event and it is hoped to better the £3675 raised in 2010. Every year more and more radio amateurs have taken part. In 2010, 15 individuals or groups were involved, for 2011 many more stations registered on the SOS Radio Week website.

At the Norbreck Amateur Radio Rally last year, event founders Derek, G7LFC and David, M3LFC were joined by members of the Porthmadog & District ARC to present the cheque from the 2010 event to Lisa Cooke of the RNLI.

At the National Hamfest in 2010, a new radio society was launched – the Lifeboat ARS. This society was formed with one of the main aims to continue to run and grow the annual SOS Radio Week fund raising event. They also will provide support and advice for groups wanting to run special event stations throughout the year at RNLI stations.

BACK AT THE BEGINNING. In 2005, 10 year old David passed his Foundation licence and gained the callsign M3LFC. He'd always been interested in the RNLI and decided to organise a three month operating marathon in 2006. David was sponsored during this operation and raised £300 for the RNLI. They rewarded his efforts with a day out at Lytham St Annes RNLI station, which seems to have been a memorable day.

When the RNLI announced their first SOS Day in 2007, M3LFC and G7LFC decided they'd do some fund raising during the week leading up to SOS Day. That's when SOS Radio Week came about. Since then, David and Derek have encouraged more amateurs and groups to get involved and the event – and the money raised – has grown year on year.

With the Lifeboat ARS now acting as liaison between radio amateurs and the RNLI, the event in January 2011 looks to have been the best yet. Many radio clubs and individuals got together with their local lifeboat stations or set up nearby. We've got some reports from clubs who got involved included in this article.

SPONSORS. New for 2011 was the Icom UK involvement. They provided an ID-E880 D-Star dual band mobile and an IC-E80D D-Star dual band handheld to be awarded to the group and individual, respectively, that raised the most money during SOS Radio Week 2011.

Icom UK are already involved with the RNLI through the marine division of their business and are members of the RNLI Ambassador Scheme. This involves Icom UK promoting RNLI membership. They do that by offering a year's introductory membership with the purchase of either the IC-M71 VHF marine transceiver, IC-M505 or IC-M603 VHF/DSC marine transceivers – all of which were on display at the recent Boat Show in London.

Martin Lynch & Sons also supported the 2011 SOS Radio Week by offering a Wouxun KG-679E 2m handheld. So if you don't win one of the main prizes for your fund raising you will be entered into a draw for other prizes such as the Wouxun radio.

Snowdonia Radio Company started their sponsorship in 2010 and have done so again this year. They sponsor the SRC Young Persons Award that goes to the young person who has put most into the

Scarborough Special Events Group members Kevin, G0NUP, Roy, G4SSH and Nick, G4OOE with 9 year old logger Emily.

Event founder G7LFC operating VHF at the Porthmadog & District ARS special event station.

Bob, MW0RHD demonstrating radio to sea scouts at the Porthmadog & District ARS special event station.

event – not raised the most money or made the most contacts but one who has really participated well.

Sigma Euro-Comm donated four antennas for the draw too. Other sponsors this year were dynanti web design and G7LFC software.

AWARDS. If you worked any of the stations involved in SOS Radio Week 2011 (and there's a list of stations on the website), then you are able to apply for an award. The Worked SOS Radio Week Award has various levels that can be claimed. Working one station qualifies for a commemorative certificate, three stations is the Bronze Award, six station is the Silver Award, then stations is the Gold Award and 15 stations earns the Platinum Award.

These awards are free but the organisers would appreciate a donation to the RNLI – and this can be done via the website. Full details of how to apply for the award also are on the website.

GB4RNLI. The Scarborough Special Events Group was on the air as GB4RNLI in support of fundraising for the Royal National Lifeboat Institution's SOS Radio Week. This was the third year in which the Group had operated on behalf of the RNLI and they are grateful to all amateurs who contacted the station and forwarded donations for the RNLI.

Scarborough Lifeboat Station was one of the first to be established, in 1801. In the last year, volunteer lifeboat crews in the north of England launched 1090 times and rescued 1013 people.

The Group were active on SSB, CW and PSK and exchanged greetings with approximately 500 stations, mainly throughout the UK and Europe but also some DX stations in Turkey, Canada, Israel, Japan and the USA, who were particularly interested in the event.

GB0PLB. Once again, members of the Porthmadog and District Amateur Radio Society got stuck into SOS Radio Week. They ran two special events. For the first weekend, 22 and 23 January, they took over the crew room in Cricieth lifeboat station. For the second weekend, 29 and 30 January, they operated from the Porthmadog Yacht Club.

The radio club would like to give special thanks to Peter Williams, the operations manager of Criccieth Lifeboat Station for all his help in arranging the first weekend of operating.

The station used a Trio TS-480S for HF operations, a Yaesu FT-8800 for VHF working and a Wouxun KG-699E handheld for 4m contacts. The antennas were a SRC X80 HF vertical, SRC X65 wire and a V-2000 6m/2m/70cm, all kindly donated by Snowdonia Radio Company.

GB4CLB. GB4CLB, part of the RNLI SOS fund raising week was operational on Friday 27, Saturday 28 and Sunday 30 January by Norfolk County RAYNET (RSGB) as part of Exercise Sea Over Sand. The station was set up in the Lifeboat crew room of Cromer Life Boat – Cromer life Boat Shed being located at the end of Cromer Pier. The aerials, an inverted V, ¼ wave dipole for 17m and a SRC80 vertical were set up outside the shed, the dipole hanging over the sea, the vertical lashed to handrails and the inverted V over the decking. A 2m home brew ribbon (used as control during RAYNET exercises) on top of a 10m pole completed the aerial setups. The transceivers used were a FT-900AT, FT-897 (both running 100W) and a TM-G707 for FM work.

The station made a combined total of nearly 250 QSOs on 80, 17 and 20m over the three days and a large handful of 2m contacts. Operators were M6TZY, M6JWW, M6EMT, M6TKE, M0VRA, 2E0DJR, G0SMS, G1DXQ, G7FSI, G7VAH and G8UJO. The organisers of the special event station can't praise the operators enough for their excellent operation and especially G7FSI in setting up the aerials and station. Many thanks must also go to the Cromer Life Boat's Crew and officials for their permission, help and warm welcome. All of the operators and Life Boat Crew made the event a really enjoyable time.

GB4CHC. The Crewe 'Railway' Heritage Centre ARS is pleased to have taken part in the SOS 2011 Radio Week with its Special Event Station GB4CHC. In doing so it has raised £92 to date (with other possible donations still to come) through sponsorship in support of the RNLI. The total number of QSOs made was 111 covering 45 countries, significant ones being JA, 4S7, HI, KP4, ZS and HK all using SSB and various datamodes.

Although Crewe, Cheshire could hardly be described as a coastal town, members of the Crewe Heritage Centre ARS have associations with maritime aspects of radio communications and are great admirers of the RNLI and the work it does. The Secretary of the club was a Marine Radio Officer in the 1950s operating world-wide and in particular the Persian Gulf and Indian Ocean.

NEXT YEAR. SOS Radio Week 2012 will take place from 21 – 29 January 2012. More reports next month.

WEBSEARCH

www.sosradioweek.org.uk
www.icomuk.co.uk
www.mlands.co.uk
www.snowdonia-radio-company.co.uk
www.sigmaeurocomm.co.uk
www.dynanti.co.uk
www.norfolkraynet.org.uk
Scarborough Special Events Group: www.sseg.co.uk

GB4CLB operated by Norfolk County RAYNET (RSGB) as part of Exercise Sea Over Sand.

Crewe Heritage Centre ARS members standing in front of the Advanced Passenger Train Exhibit that is used both as the Club House and 'radio shack'.

At the Norbreck Amateur Radio Rally last year, event founders Derek, G7LFC and David, M3LFC were joined by members of the Porthmadog & District ARC to present the cheque to Lisa Cooke from the RNLI.

Alan, GW0SAU on the HF bands at the Porthmadog & District ARS special event station.

VINE antennas ltd

We pride ourselves on giving the best advice in the business, based on 40 years of amateur radio and 15 years trading.

Taranaki, Four Crosses, SY226RJ Tel: 01691 831111

Visit our new and much-improved website www.vinecom.co.uk Business hours 9-6, Mon-Sat

ICOM

Vine can now offer ICOM equipment backed by ICOM UK's comprehensive warranty program. Everyone asking us for a price for a new ICOM radio has been **AMAZED** by the deals we can do. Call us for a quote!

For the best UK price on this and all other ICOM radios & accessories -

Contact the ICOM specialists at Vine

ACOM

ACOM amplifiers are without doubt the best-selling tube amplifiers in the world. This success is based on the selection of the best components, the factory's dedication to military-specification production techniques and our obsession with after-sales service. Hundreds of UK amateurs now have these fine amplifiers in their shacks and all say that for quality and value for a tube amplifier, ACOM simply cannot be beaten.

New from ACOM - ACOM 1011. Uses a pair of rapid warm-up 4CX250B tubes for 700W SSB/CW and 500W RTTY output.

1011	**160-10**	**700W o/p**	**Manual tune**	**£1499**
1010	160-10	700W o/p	Manual tune	£1599
1000	160-6	1000W o/p	Manual tune	£1999
2000A	160-10	2000W o/p	Automatic	£4995
2000	160-6	2000W o/p	Manual tune	TBA

NEW - G0KSC-designed *OWL* yagis for 2M.

Wideband optimised yagis.

The OWL by G0KSC provides the benefits of both OWA (Optimised wideband Array) 50 Ohm antennas with those of traditional low impedance antennas. Our OWL designs offer matching by adjustable folded dipole. Designs from 3 to 12 elements are in production, with others in design. Check our website for more information on these new and high-performance antennas.

Moxons and Super-Moxons

The greatest gain per boom length available, excellent front/back ratio and modest wingspan make the Moxon rectangle an excellent choice. We offer models for 2,4,6 and 10m
10M model (shown) is only 12ft 6" across, lightweight and **only £ 149.95**

We picture opposite the highly-successful SPE Expert 1K-FA solid-state amplifier. Nothing comes near the Expert for operating convenience and versatility.

* 2 Antenna inputs, 4 outputs
* Choice of two ants settings per band
* Up to 1000W output, auto ATU
* Quiet, effortless operation
* CAT control from modern transceivers
* Full HF AND 6m coverage
* Small - fits into any shack

In this small ad, we can't possibly show you everything. We also offer -

- Aluminium for antenna building
- Insulators for antenna building
- Towers and masts
- High-end tube audio systems
- Precision component manufacture
- Antenna rotators for every antenna
- Antenna switches, manual and auto
- I.F. Filters for better selectivity
- Bandpass filters manual and auto
- Antenna stack-match switches.

NEW DB-11 YAGI FROM STEPPIR NOW IN STOCK. 3 EL ON 17-6M, 2 EL ON 20M. LONGEST ELEMENT 19FT, BOOM 11FT. IDEAL FOR UK RESTRICTED QTH'S. NO TRAPS OR COILS SO THIS SMALL BEAM REALLY WORKS

Tel 01691 831111 - info@vinecom.co.uk - www.vinecom.co.uk

Designed in the UK,
Made in the UK.

Tel. 01298 70012
www.peakelec.co.uk
sales@peakelec.co.uk

West Road House
West Road
Buxton
Derbyshire
SK17 6HF

PEAK® electronic design ltd

Atlas DCA - Semiconductor Analyser with Carry Case!

The famous Peak Atlas. Still great value even though VAT has gone up!

Fitted with sturdy universal premium gold probes. Just connect any way round to identify the type of part, pinout and lots of parameters.

Supplied with battery, comprehensive user guide and padded hard carry case (choose either blue or black).

Supports bipolar transistors, darlingtons, MOSFETs, diodes, LEDs and more...

Order Code ATPK1

£42.50 + VAT

=£51 inc VAT. Limited Offer.

Please add £3 for UK P&P

Case available in black or blue.

Homebrew

Continuing the HF transceiver project with a broadband linear power amplifier

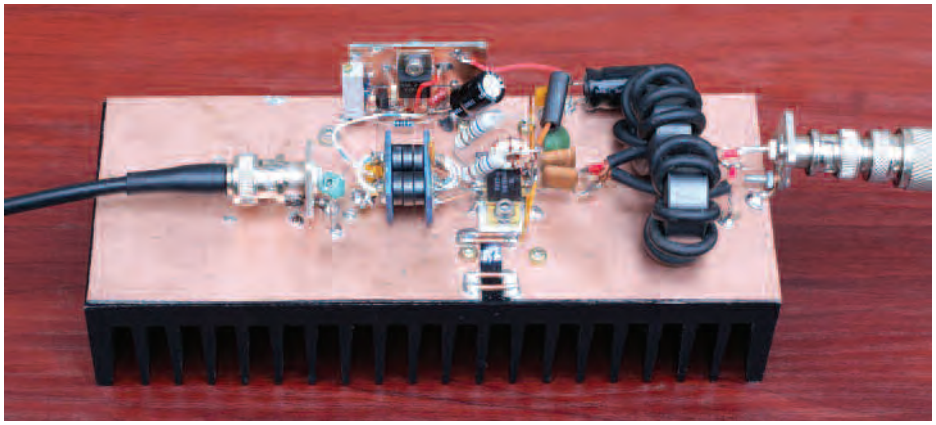


PHOTO 1: The 10W Class A broadband linear amplifier we build this month.

HARD WORK. Broadband power amplifier design and construction can be one of the more difficult challenges for the homebrew radio enthusiast. High power amplifiers designed to run from a 12V supply can be particularly problematic. If we take the extreme case of a single ended 12V 100W transistor PA, the collector load impedance will be approximately $(Vcc\text{-}V_{sat})^2/2P_o$. Even allowing a minimum voltage swing to just 1V on negative peaks, this gives a collector load impedance of $11^2/200 = 0.6\Omega$. The input impedance at the base terminal of a bipolar transistor operating under these conditions is typically below 1Ω. Because transistor gain decreases with frequency, the resistive part of the input impedance tends to decrease with rising frequency. Power FETs have a slightly higher input impedance, but still in the single ohms range at HF and VHF. Working with such low impedances and high current levels is difficult for the designer and constructor. It is also potentially very costly when the magic smoke finds its way out of your power transistors.

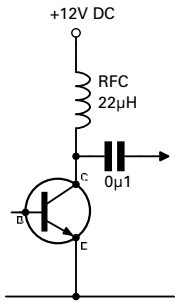
We have built some reasonably successful broadband amplifiers for some of our previous projects. The 20W push-pull PA (January 2007) has an almost perfectly flat response up to 21MHz and a few dB roll-off at 30MHz. The 400W MOSFET PA (August 2008) offers similarly good performance up to 21MHz or so, but gain falls off quite sharply on the 10m band. For this project, I will attempt to push the boundaries a bit further by including the 6m band in the specifications. The low level amplifier described last month has a very flat response from 1.6MHz to more than 70MHz. It will be a bit more difficult to achieve similar bandwidth from a power amplifier. As several commercial transceivers have broadband PAs that work from 1.8 to above 50MHz, at least we know that it can be done.

The maximum RF power output available at the collector (or drain in the case of a FET) of a 12V power amplifier with an inductor (RF choke) in the output circuit is $Vcc^2/2R$. **Figure 1** shows a simplified RF power amplifier. When the output load resistance is 50Ω, the maximum output power is 1.44W. Increasing the supply voltage to 13.8V gives a maximum of 1.9W. As the load impedance is fixed at the standard value of 50Ω, the only way to increase the output power beyond this level is to increase the output voltage swing. There are a number of ways of doing this. The most obvious method is to simply increase the supply voltage. Increasing the supply voltage to 50VDC would increase the maximum output power to around 25W. Many transistors also show better linearity at higher supply voltages, but you should make sure that the maximum voltage rating of the transistor is not exceeded. Peak collector voltage will approach twice the DC supply voltage when the output is properly terminated by a 50Ω load and even higher voltages are possible when there is a mismatch at the amplifier output. The other option is to use some kind of voltage transforming network between the transistor and the load. Single band amplifiers can use a resonant matching network for the voltage transformation. For a multi-band amplifier, the only practical solution is a broadband transformer. Conventional flux-coupled transformers and transmission line transformers are both widely used for this application. The transformer is usually wound on a ferrite core.

FERRITE AND POWDERED IRON CORES.

The ferrite toroid core is one of the most mysterious components used in radio construction. To the uninitiated, a ferrite toroid has no obvious function. It is just a doughnut shaped object made from hard black stuff. However, this black stuff has some rather magical properties. Inductors used at low frequencies are often wound on a high permeability magnetic core. Transformers for mains electricity or other low frequency applications like audio transformers are usually wound on an iron alloy core. A wire with a current flowing through it is surrounded by a magnetic field. The presence of the transformer core contains and concentrates this magnetic field in a way that greatly increases the inductance of the transformer windings. The inductance increases by an amount that is proportional to the relative permeability of the core material. Permeability is usually measured relative to the vacuum permeability of free space (if such a place existed). As the difference between the permeability of air and free space is very small, for most practical purposes, the permeability of air is also 1. The relative permeability of magnetic cores ranges from about 8 for iron powder RF toroids, to several thousand for high permeability ferrite and iron alloy cores.

A well designed power transformer is quite efficient. Most of the energy fed to the primary



$$Vcc_{min} = \sqrt{(2 * R_L * P)}$$

$$R_L = \frac{(Vcc - V_{SAT})^2}{2 * P_O}$$

$$P_O = \frac{(Vcc - V_{SAT})^2}{2 * R_L}$$

FIGURE 1: Simple amplifier and its associated calculations (see text).

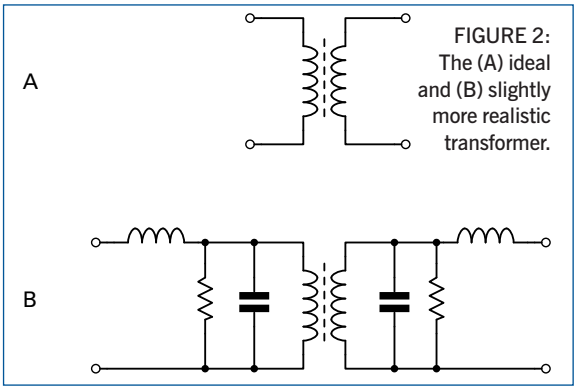


FIGURE 2: The (A) ideal and (B) slightly more realistic transformer.

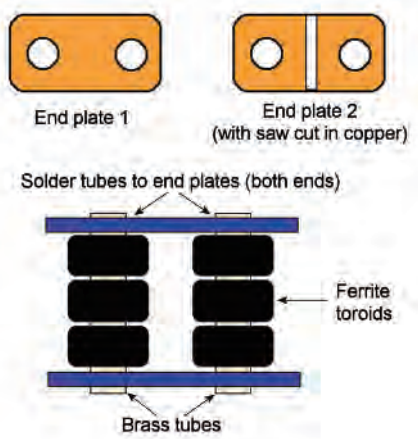


FIGURE 3: Construction of the output transformer.

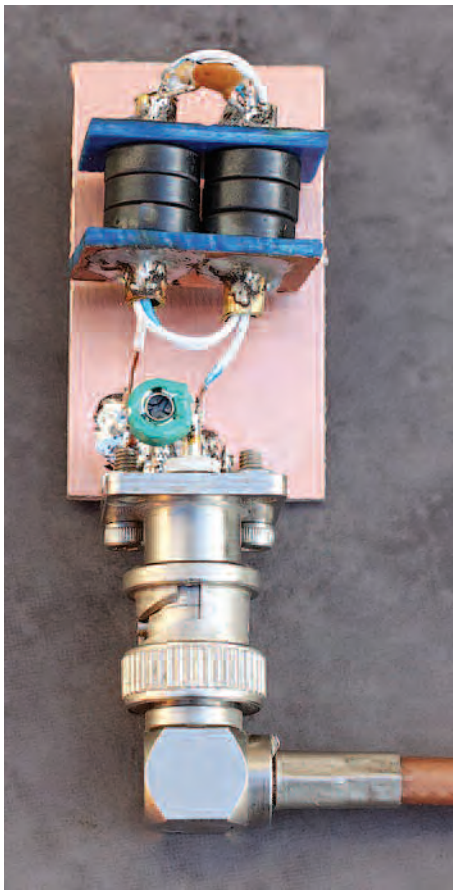


PHOTO 2: Broadband transformer in test rig.

winding will be delivered to the load, with minimal loss. (Transformer cores are not perfectly linear devices. The alternating current supplied to the primary causes an alternating magnetic field in the transformer core. Each time the field is reversed, some energy is lost due to hysteresis in the core.) The metal cores used in mains transformers work well at low frequencies but become progressively more lossy as frequency is increased. Because iron cores are conductive, current flowing in the core will lead to eddy current losses. Such losses are reduced by using iron alloys with a relatively high resistivity and making the core from a stack of laminated sheets of iron alloy with insulation between each lamination. Powdered iron toroids for use at RF are made from tiny metal particles which are suspended in an insulating medium.

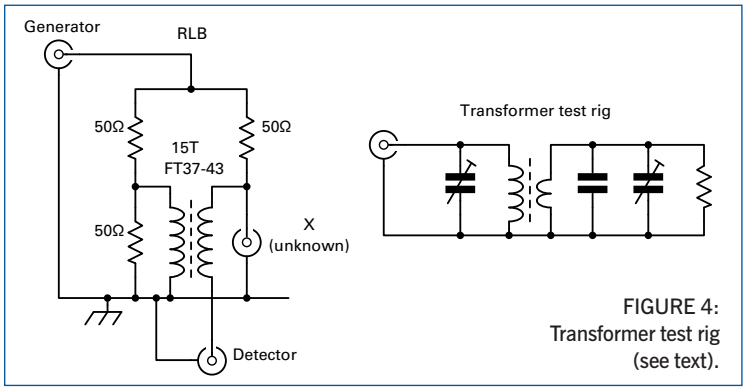


FIGURE 4: Transformer test rig (see text).

Figure 2A shows an ideal transformer. Users of electronic simulation software will be familiar with this wonderful device. It is completely lossless, works over an infinite bandwidth, the primary/secondary voltage ratio is exactly the same as the turns ratio and the impedance ratio is the square of the turns ratio. Such transformers don't exist in the real world. The transformer model in **Figure 2B** is more accurate, although this model is also incomplete. This transformer has losses due to resistance in the primary and secondary windings, capacitance of both windings and leakage inductance due to imperfect coupling between primary and secondary. Other imperfections include core losses as mentioned earlier and core saturation that causes winding inductance to vary with winding current. Non-linearity due to core saturation can be avoided by careful selection of core material and by using a core that is sufficiently large for the power level used.

Iron powder toroids like the Amidon type 2 and type 6 cores used in some of our recent projects make very good high Q inductors for use in filters. These cores have relatively low permeability. They are not prone to non-linearity caused by core saturation and have very low eddy current losses because of the way that individual iron particles are separated by insulating material. The low relative permeability of iron powder toroids makes them less suitable for use in broadband RF transformers. As a rough rule of thumb, transformer windings should have an inductive reactance (X_L) that is several times greater than the impedance the winding is connected to. For example, a transformer winding for use in a 50Ω circuit should have an inductive reactance of several hundred ohms at the lowest operating frequency.

A broadband transformer wound on a low permeability core would require a large number of turns for satisfactory operation at lower frequencies. This would result in high winding capacitance in a conventional transformer or greater phase delay in transmission line transformers.

Ferrite toroid cores are widely used in broadband circuits. Relative permeability of ferrite cores ranges from about 30 to several thousand. The two most popular types for RF applications are type 61 with μ_i (initial permeability) of 125 and type 43 with μ_i of 850. These are suitable for use in low Q broadband transformers at MF/HF and into the VHF region with increased losses. High permeability ferrites are prone to core saturation. Take care to use a core that is large enough for the application. Relatively high losses at HF/VHF make these cores unsuitable for high Q applications like filters and resonant matching networks.

Transmission line transformers wound on ferrite cores can work over a huge bandwidth. The balun transformers in some diode mixers work well from MF to UHF.

A BROADBAND CLASS A POWER AMPLIFIER.

The Class AB driver/PA from January 2007 would be very suitable for use in a 160m-10m transceiver. The low level amplifier described last month provides sufficient output to drive this PA to 20W on the lower bands and 14W at 29MHz. Gain falls of very sharply above 30MHz, so this amplifier won't work on 6m.

My intention was to build a push-pull MOSFET PA using Mitsubishi FETs designed for use in AM/SSB CB equipment. Postage delays over the Christmas and New Year holiday period meant that the RD16HHF1 MOSFETs and suitable ferrite cores were not available in time for this month's project. Instead, I will use a TPV3100 dual transistor [1] for the prototype of the PA project (**Photo 1**). Other VHF power transistors should also

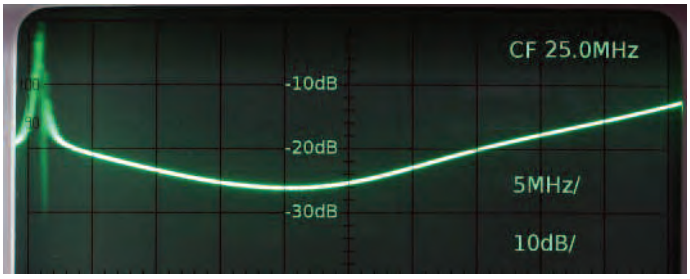


FIGURE 5: Return loss from transformer.

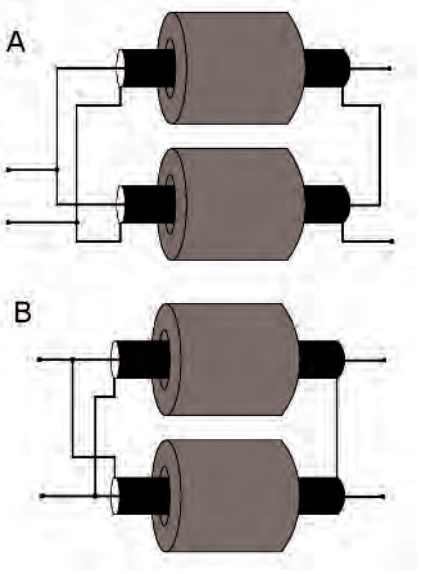


FIGURE 6: Output matching transformer schematic, showing two different configurations.

work well in this circuit. The use of negative feedback and Class A operation should ensure good results from a wide range of VHF transistors. I have a good stock of small FT37-43 ferrite cores, but I will have to make the broadband output transformer using only High Street components. I love a challenge!

My new rig will be used to drive a legal limit MOSFET PA (August 2008). This amplifier requires about 6-7W of drive for 400W out. A 10W PA will be a good match for the MOSFET amplifier. This is also a useful power level on the 6m band, which is not covered by my 400W linear. In keeping with my stated goal of making a better rig than my previous one, I have decided to build a highly linear Class A PA.

The TPV3100 is a dual transistor (two devices in one package) designed for linear Class A or Class AB operation at VHF. Having both devices in a single package should mean that the two transistors are well matched. Having a single mounting flange greatly simplifies the mechanical and heatsinking arrangements.

The amplifier will be in a push-pull configuration with broadband input and output matching transformers. The datasheet figures suggest an input impedance of around 1Ω at 200MHz. As I will be using the transistors at a much lower frequency and at a lower power level, I will assume a higher input impedance of 2-3Ω for each transistor (or 4-6Ω across the push-pull inputs that are effectively in series). After a few experiments with both conventional and transmission line transformers, I decided that a conventional transformer with a turns ratio of 3:1 and impedance ratio 9:1 would give the best results. Tight coupling between primary and secondary is critically important if we are to achieve broadband operation from 1.8MHz

PHOTO 3: Close-up of the practical output transformer.

to 52MHz. A high value of leakage inductance would limit high frequency performance. The transformer secondary winding is just a single turn made from two lengths of 4mm brass tubing (B&Q) and two end plates made from single-sided PCB laminate. I used a hacksaw to cut the copper foil on one of the end plates at a point half way between the ends of the brass tube. This forms the open end of the single turn winding. A total of six FT37-43 ferrite toroids were used for the transformer core, three on each brass tube. The primary winding is three turns of insulated wire threaded through the brass tubes. Each tube is 21mm long. **Figure 3** shows details of the transformer construction.

The measured inductance of the primary winding was 20μH. This is 226Ω of reactance at 1.8MHz. A perfect transformer would show an inductance of zero with a short circuit load. With a small strip of copper soldered across the single turn secondary, the measured primary inductance was 0.25μH, or X_L=78.5Ω at 50MHz. Because of the difficulty of measuring extremely low values of inductance, the secondary winding leakage inductance was assumed to be 250nH÷3^2 or 27.8nH. These are just ball-park figures to be used as a starting point for choosing HF compensation capacitors. My L/C meter uses a 0.5MHz test oscillator, so the measured values could be quite far from the actual values at HF/VHF.

The transformer secondary was terminated by a 5.5Ω resistance. I used 10Ω in parallel with 12Ω. The resistors are 0.25W metal film types. I used a tracking generator and spectrum analyser to measure return loss at the primary winding. The first test was encouraging. Return loss was good up to about 34MHz, but quite poor around 50MHz. Placing a capacitor with X_C=78.5Ω = 40.5pF across the primary and a capacitor with 9 times this value (365pF) across the low impedance secondary gave much better results. I used a 40pF trimmer that has an actual maximum C around 45pF and a 390pF fixed ceramic disc capacitor for the tests. Details of the test rig and return loss bridge were in January 2009 Homebrew and are shown in **Figure 4**. A plot of return loss from LF to 50MHz is shown in **Figure 5** and the transformer and test rig are shown in **Photo 2**.

The amplifier output matching transformer is a transmission line 1:4 impedance transformer. Each transmission line is 6 turns of coax cable on a Maplin N88AB ferrite toroid. The transformer configuration is shown in **Figure 6A**. **Figure 6B** shows how the circuit can be slightly reconfigured to achieve the same result.

The optimum impedance for the coax is 25Ω. I could have used two parallel lengths of miniature 50Ω coax, but instead, I decided to use the nearest equivalent to 25Ω coax that I could find. Each of the two toroids is wound with six equally spaced turns of Maplin XR16 screened audio cable. This has a measured capacitance of 232pF/m and inductance of 210nH/m, indicating a characteristic impedance of √(L/C) = 30Ω. As each coax line is just over 30cm long, cable losses are a tiny fraction of a decibel, even at 50MHz. **Photo 3** shows the completed output transformer.

The amplifier will operate in Class A. The output voltage swing of each transistor will be limited to 10V or preferably less. The output transformer presents an impedance of 50/4=12.5Ω to the transistor collectors. This is 2x6.25Ω for a push-pull amplifier. Output power will be 10^2÷(2×6.25) = 8W

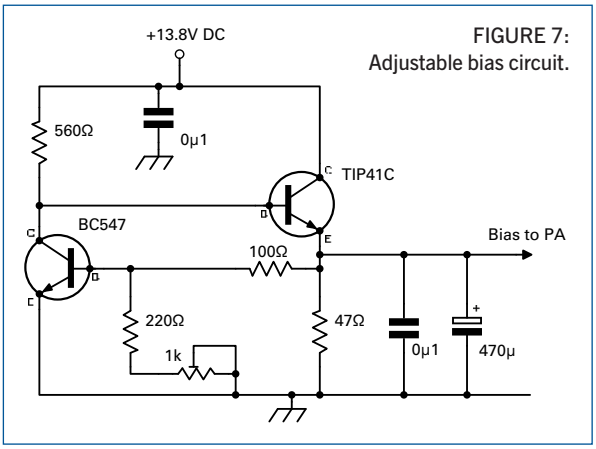
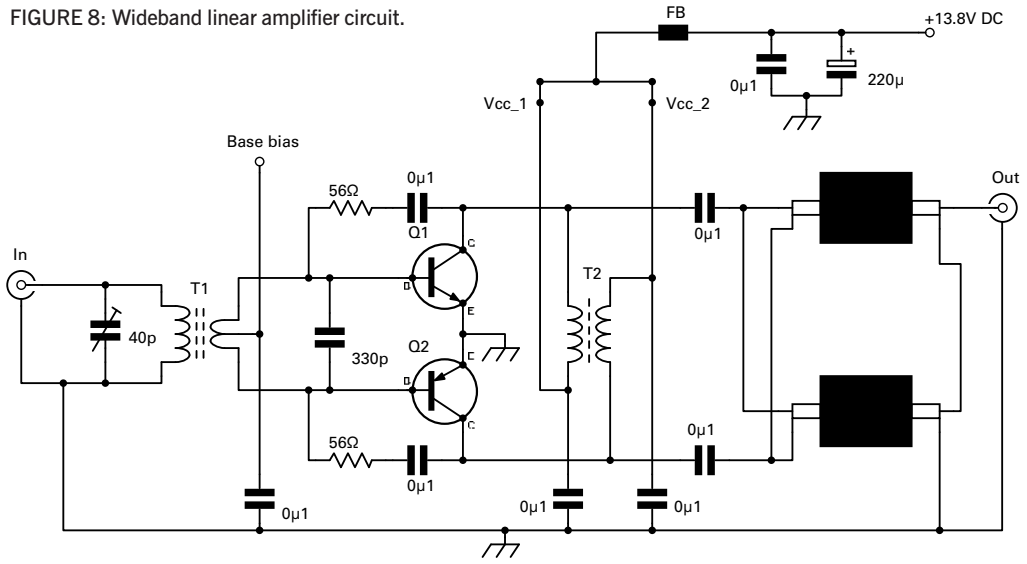


FIGURE 7: Adjustable bias circuit.

FIGURE 8: Wideband linear amplifier circuit.



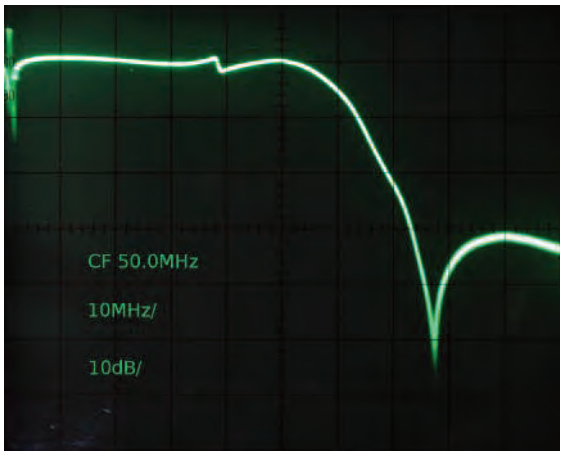


FIGURE 9: Power output of the prototype amplifier from LF-100MHz.

(see Figure 1) for each transistor, or 16W for the pair. In the interests of linearity, the amplifier will normally be run at a maximum output of just 10W. The bias circuit is shown in **Figure 7**. This circuit can generate an adjustable bias voltage from 0.75V to 1.1V.

The amplifier was built on a strip of PCB laminate on the back of a reasonably large heatsink with a thermal resistance of about 1.5°C/W. **Figure 8** shows the circuit diagram. The 56Ω resistors are 2W metal film types. The 100nF capacitors in the collector to base feedback network are critically important components. They should be good quality ceramic types with a voltage rating of 100V or more. The ferrite bead in the collector supply is a Maplin N98AB. T2 is 8 turns of 0.375mm enamelled wire on a FT50-43 core. For clarity, the schematic shows each coax line in T3 as a single turn. Each core actually has 6 turns, as shown in Photo 3. The collector supply for the transistors is shown as Vcc_1 and Vcc_2. These points are normally connected together, but they can be separated to check the current balance between the transistors. Photo 1 shows the finished amplifier.

TESTING. The bias voltage was set to minimum by adjusting the 1k pot to maximum resistance. Next a 50Ω load was connected to the output, the 13.8VDC supply was connected and the bias adjusted for a standing current of 2.5A (a DC input of 34.5W). After one hour of running at this level, the transistor header was at 65°C and the heatsink was warm, but not excessively hot. I reduced the value of the 390pF capacitor across the secondary of T1 to compensate for the transistor base capacitance. A value of 330pF gave best results. The 40pF trimmer was adjusted for peak output at 50MHz. **Figure 9** shows a plot of the amplifier frequency response from LF to 100MHz. Peaking the T1 frequency compensation for a peak at 50MHz caused a slight 'glitch' at 38-40MHz, but as this is far removed from any amateur bands, it is of no consequence.

Gain is very flat up to 34MHz and still within 1dB of the MF/HF value at more than 50MHz. Power output for the test was 10W. At this point, I decided to have another little tweak at the T1 trimmer capacitor. The trimmer is new and quite stiff, so I have to push the screwdriver quite hard to turn it. During this operation, I heard a slight click. This was followed by a smell of burning components! The over-current trip shut down the power supply. The post-mortem examination revealed that the TIP41 and the BC547 in the bias circuit were both blown. I decided that the most likely cause of the failure was a short circuit between the T1 secondary and ground while I was tweaking. The TIP41 was short circuit from C-B-E, so when I removed the pressure from the screwdriver, the full 13.8V supply would be applied to the base of the two RF transistors. As it turned out, the fault was actually caused by a short circuit between the primary and secondary of T1, probably caused by the heat of the soldering iron during the test rig experiments. Replacing the primary of T1 with three turns of nice new insulated wire and changing the two transistors in the bias circuit cured the problem. The TPV3100 was not damaged.

The bias was increased to 3A (or 41W) for on-air testing. A few transmissions on 160m resulted in some very good reports on the audio quality. I was surprised to hear my own 10W 160m signals quite clearly on the HB9FX WebSDR receiver in Switzerland.

Figure 10 shows the voltage measured at the collector of both transistors (red and yellow) and the output voltage (green). Output for this test was 66Vpp into 50Ω, or just under 11W. Note that no LPF was used for this test. Because the amplifier is well balanced, second harmonic suppression is excellent, at -40 to -50dBc in the 5-10W output range. Third harmonic suppression is not quite as good, but still reasonable at -30 to -35dBc.

REFERENCE:

[1] Motorola TPV3100 data sheet.

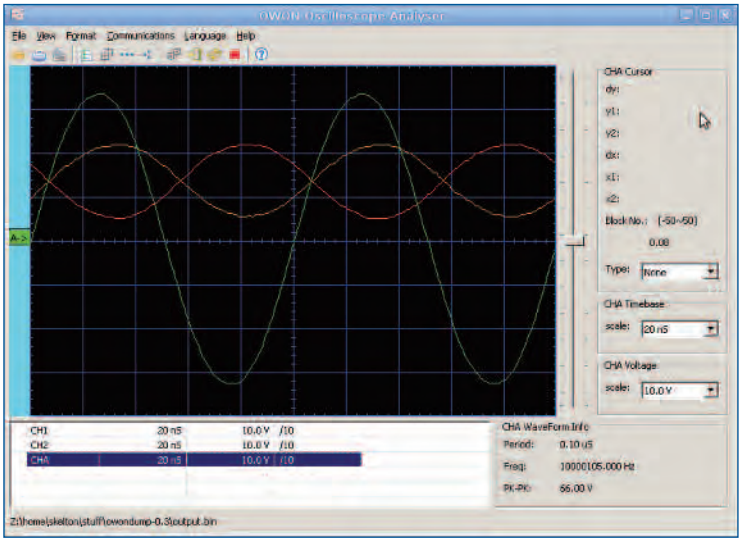


FIGURE 10: Measured collector voltages (red, yellow) and output voltage (green) at 11W output.

RSGB shop

Inside Enigma

from £12.74

The Secrets of the Enigma Machine and other Historic Cipher Machines

By Professor Tom Perera, W1TP

The breaking of the Enigma Codes in WWII was one of the defining actions of the whole war. Many books have been written about this as one of the best kept secrets of WWII. Few have looked right inside the Enigma cipher machine itself, but *Inside Enigma* does just that.
Inside Enigma brings to life how the Enigma machines were used, how the messages were encoded and why the Enigma code was virtually unbreakable. With more than 500 pictures this book explains exactly how these machines were constructed and worked. *Inside Enigma* is a comprehensive and copiously illustrated handbook covering the secrets of the Enigma Machine and the theory and practice of cipher machines in the 20th century.

Size 202x254 mm, 208 pages, ISBN 9781-9050-8664-1

Non Members' Price £14.99 **RSGB Members' Price £12.74**

The Spies Who Lost the Battle of Britain DVD

from £9.99

A groundbreaking new 60 minute documentary

This brand new DVD explains the story of how on the brink of the Second World War a top-secret invention joined Britain's frontline. *Chain Home* was the radar network that gave the RAF its vital early warning and enabled Air Chief Marshal Dowding and Air Vice Marshal Park to put their fighters exactly where they needed to be. In just four frantic years Watson Watt's brilliant team of boffins had designed and built *Chain Home,* the radar system that was to play such a decisive role in the victory of 1940. Why the Germans failed to destroy Chain Home before the Battle of Britain has been an enduring mystery. This DVD explains through reconstructions, exclusive interviews and expert analysis how the Zeppelin spies came to make the greatest intelligence blunder of the war.

DVD: Format 16:9, PAL Colour & B/W, 63 minutes, DVD Region 0

Non Members' Price £12.99 **RSGB Members' Price £9.99**

SAVE 25% OFF RRP

INSIDE ROOM 40

from £14.99

The Code breakers of World War 1

By Paul Gannon

Many are familiar with the code breaking efforts of Bletchley Park during WWII however few are aware of the British code breaking efforts during WWI. *Inside Room 40* sets out to explain the activities of the British code breakers and their successes during the 1914-18 World War.

Inside Room 40 is based on previously secret files that bring to life the hidden history of the British code breakers. From the very earliest luck of capturing a German Naval code book from a hapless German cruiser that ran aground in August 1914, through to the deciphering of the famous "Zimmermann" telegram that brought the United States into the 1st World War, it is all chronicled here. There are even details of the efforts of a few British radio amateurs who established a receiving system so sensitive that it picked up messages the Germans believed couldn't be overheard, so didn't even encode them. As coding technology developed so did Room 40, such that by the war end they were reading the messages used by German warships, U-boats and naval zeppelins, and breaking the ciphers used by the Germans to communicate with their naval attaches and embassies around the world. *Inside Room 40* also details the methods used in code breaking, along with the early tabulating machines that were the forerunners of the "Colossus" computer famously used at Bletchley to break German codes in WWII.

For those who are unaware of the huge contribution made to the war effort by the code breakers of Room 40 this hardback book is a revelation. *Inside Room 40* provides a detailed and comprehensive view of this little known area of WWI history.

Hardback - Size 157x237mm, 294 pages, ISBN 9780-7110-3408-2

Non Members' Price £19.99 **RSGB Members' Price £14.99**

POST & PACKAGING FREE FROM £50
See page 80 for full details

3 Abbey Court, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496
E&OE **All prices shown plus p&p**

Radio Society of Great Britain
www.rsgbshop.org

ICOM

What You've All Been Waiting For!

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

LCD not shown with accurate colour

New! IC-E80D VHF/UHF Dualband Handheld

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

New! ID-E880 VHF/UHF Dualband Mobile

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

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

Join the Worldwide D-Star Community!

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

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

2-Year Warranty

DIGITAL

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

DV Access Point Dongle

Your own personal D-Star access point

The small DV Access Point dongle.

D-STAR. Whether you love it or hate it, D-Star is here and many amateurs worldwide are taking part. I have enjoyed experimenting with D-Star and recently bought the DV Access Point Dongle, or DVAP for short. Here's how I got on.

DVAP. The DVAP is a 2m, 10mW D-Star simplex node from Internet Labs that can be used to access the D-Star network. Unlike the original DV Dongle, which uses your computer's sound card, the DVAP must be used with a 2m D-Star radio. This means you can operate D-Star anywhere within range of the device and are not tied to your computer. In the box you'll find the dongle device itself, a USB cable, 'getting started' leaflet and a stubby aerial with a right angled SMA adapter.

You will need a medium spec PC or Mac on which to run the *DVAPTool* software, a spare USB 2 port and a broadband internet connection, with either Windows *XP* (or above), *Linux* or Mac *OS X Leopard* (or above). I have successfully tested it on a desktop PC with Windows Vista and a Netbook running Ubuntu Linux with both a Virgin Media and a '3' mobile broadband internet connection.

INSTALLATION. Installation is easy. Plug the DVAP into the USB port and let the computer find and install the FTDI USB drivers. The device draws its power from the computer so no external supply is needed. The device firmware can be easily updated (if necessary) from the www.dvapdongle.com website.

To operate the DVAP, you need to download and run the *DVAPTool* software, again from www.dvapdongle.com. On Windows you simply run *DVAPTool.exe*, which opens two windows: one is for the main graphical DVAPTool interface, the other a scrolling log of activity. On *Linux* you run the *DVAPTool* executable from the shell prompt, again a window will open with the main graphical interface, with a scrolling log of activity in the shell window.

The first time you run *DVAPTool*, you need to set the frequency and callsign. Something to watch out for is that the frequency must be entered in Hz, not MHz. For the callsign, there is a convention of adding an 'A' as the last character, to let to other users know that you are operating through a DVAP. The other thing you must do is to tick the 'lock callsign' box, which means the device will only respond to a radio configured with that callsign, which is important for licensing reasons.

Once the initial setup is complete, click the 'Open' button to connect the computer to the DVAP. You should hopefully get a message saying the version of *DVAPTool* is up to date. That is all the work required on the computer; the rest is done from the radio.

You do need to ensure that your callsign has been registered for use on the D-Star system, which would normally be done by your local D-Star repeater keeper. Don't forget, if you use the 'A' suffix, you should have that registered too.

OPERATING. Setting up your radio is easy. Select the correct (DVAP) frequency and choose DV mode. Because the DVAP is a simplex device, you should not configure an offset. You next go into the callsign menu and set the 'My' callsign field to your own callsign, which should be exactly the same as you set in the *DVAPTool* window. The RPT1 and RPT2 fields are left blank.

By putting 'DVAP…I'‡ in the 'Your' or 'UR' callsign field and the keying the mic, a voice should come through the radio saying "DV Access Point Dongle", to confirm that everything is working.

Just like operating through a 'full' D-Star node, you control the dongle through commands in the 'Your' or 'UR' callsign field. So, for example, to link to reflector 5a you would put 'REF005AL' in this field and then key the mic. The radio should come back with a voice saying "Remote System Linked". To unlink you put '.....U' ‡ in that field and again key up. The radio should respond with "Remote system unlinked".

‡Note: . represents a space.

Just like its sister device, the DV Dongle, the current DVAP device supports only D-Plus operations. The original D-Star standard produced by JARL includes a method of operation called callsign routing where the system automatically locates the last node they were heard on. This is not currently supported on the DVAP, however, in practice, callsign routing is mainly only used for D-Star contests as D-Plus is not allowed. The only other restriction I'm aware of is the device does not currently support D-PRS, the Digital GPS Position Reporting System. I'm informed this is planned for the next release of *DVAPTool*.

The RF power level can be adjusted from 10dBm (10mW) down to -12dBm (63μW). I have found the lowest setting works fine if I'm in the same room. If I wander around the house and out into the garden, 10mW is more than adequate. As a test, I connected it to my Comet collinear antenna and got about half a mile on 10mW.

CONCLUSION. I have been able to work stations around the world on the D-Star network through my DVAP with no problems at all. The sound quality is no different to that when operating through a 'proper' D-Star repeater. An unexpected benefit I found from having my own dedicated node was that whenever you link or unlink it to a reflector or repeater, you can be confident you are not affecting anyone else.

Technical support for the device is through e-mail, or a Yahoo group on the internet. I have posted a couple of questions and got a response from the developer himself within a day or two.

If you already own a D-Star radio and like the idea of being able to operate D-Star from anywhere around the house, the DVAP is a very useful device for around £225. It is advertised on the websites of most major dealers within the UK.

RSGB Convention 2011

Book the dates in your diary – 7 to 9 October

Horwood House is an attractive venue for the RSGB Convention.

BUILDING ON SUCCESS. In 2010, the RSGB Convention moved to a new venue, Horwood House near Milton Keynes. The move meant larger lecture rooms, which gave the organisers the chance to put on four full streams of lectures over two days – and far fewer people had to stand last year! Work has already started on the lecture programme for this year's RSGB Convention, so keep the dates free in your diary!

Following the feedback from visitors, the organisers are working with the hotel to iron out those little niggles that happen with a new venue.

HIGHLIGHTS OF 2010. One of the busiest lectures at the 2010 Convention was given by Dr Lucie Green on Coronal Mass Ejections from the Sun. Viewers of the recent *Stargazing LIVE* series on BBC1 will have seen Dr Green explaining things in a way that we all can understand. At the Convention she was more than happy to stay and answer questions for some time after the end of her lecture. The Convention was also very fortunate to have Dr Ian White, GM3SEK and Peter Chadwick, G3RZP talking about using ferrite chokes for baluns to help solve EMC problems and linear power supplies respectively. DXing was well represented with talks from well-known IOTA DXpeditioners such as Derek Cox, G3KHZ and Cezar Trifu, VE3LYC.

LOOKING FORWARD TO 2011. This year, lecture bookings are already well under way and regular attendees will be please to see that Peter Chadwick, G3RZP will be talking about the work of the IARU and discussing the myths and legends that exist within amateur radio. Following his series of articles in *Practical Wireless*, Mike Richards, G4WNC will be discussing the various datamodes, encouraging visitors to try some of the lesser known modes. Alan Messenger will be sharing his depth of knowledge on the 5MHz experiment and the analysis of the data. Michael O'Beirne, G8MOB will be returning again this year to give another talk on military communications.

If you enjoy contests, then perhaps the lecture on what happens when you submit your log in an RSGB contest and what the adjudicator does will be interesting. There will also be the usual trophy presentations on 9 October – both VHF and HF trophies this year.

If that doesn't work for you, how about satellite communications? If so, you will be delighted to know that Howard, G6LVB will be talking about the FUNcube dongle and Graham, G3VZV will be talking about the two UK-produced satellites carrying amateur UHF to VHF transponders.

The Partners Programme enjoyed another successful Saturday with a guided coach trip out to visit some of the local historic sites followed by some retail therapy. This year, the organisers are hoping to expand this to include more activities on the Sunday for partners too.

STAYING OR VISITING. Whether you choose to visit for a day or stay for the weekend there's a package to suit you. Details of costs and packages available will be on the website in the next couple of months – and there's always some savings available when booking early! We'll continue to bring you details of the lectures as they are confirmed so that you can see just what there is on offer. Remember the dates – 7 to 9 October.

The lecture rooms are larger enabling more visitors to sit in on each talk.

The lounge area is ideal for the social side of the RSGB Convention.

Some of the partners returning from their day out – note the bags that appeared during the day!

The trophy presentations will be bigger this year as they will include VHF as well as HF events.

The *EXCALIBUR*™ unsheathed.

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

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

www.winradio.com

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

Hospital Broadcasting

Encouraging amateurs to help celebrate 85 years of Hospital Radio

Anniversary edition of the Hospital Broadcasting Association magazine.

GETTING INVOLVED. Hospital Broadcasting stations, usually known as Hospital Radio, provide radio entertainment to patients in UK hospitals. Most stations are on closed-loop wires and can only be heard inside the hospital wards on headphones or speakers next to the patient's bed. There are a few stations using AM or FM free-to-air transmission. Hospital Radio stations are run by volunteers who give up a few hours of their time each week. They collect requests directly from patients in Hospital, and play these requests 'on air' and also they get involved in their local communities to help promote that station and raise funds to keep their station on the air. Most Hospital Radio stations are charities that get no outside funding so rely on donations to keep going, these funds can be raised in many ways from can collections, to providing public address facilities to various events, Fun Days, and other such events organised by clubs such as the Lions and many others.

In 2011, Hospital Radio celebrates 85 years of service and a small number of amateur special event stations will be raising the profile of Hospital Radio for a few weeks this Spring. Part of the aim of doing this is to see if these stations can learn about other Hospital Radio stations in countries outside the UK and exchange some information with them in the future.

HOSPITAL BROADCASTING WEEK. GB8HBW (Hospital Broadcasting Week) will be mainly run from the Newbury area, from 19 March to 3 April except on the weekend of the 26/27 March. During that weekend the station will be operating from the Annual Hospital Broadcasting Association Awards and Conference at the Ramada Hotel just outside Maidstone in Kent. The station will be hosted with help from members of Newbury and District Amateur Radio Society.

SOME HISTORY. Looking into the history of the Hospital Broadcasting Service you discover that Thomas Hanstock wrote to the General Post Office in 1921 asking permission to conduct experiments with portable wireless telegraph apparatus. This idea went to create hundreds of hospital radio stations across the UK and many more worldwide. Today over 90% patients in hospital can tune into hospital broadcasting.

It is thought that the first hospital radio was set up in 1926 in York County Hospital, although documentation is scarce regarding any of these early stations. In this first installation, headphones were provided beside 200 beds and around 70 loudspeakers were installed. The county hospital was rewired in 1925, which meant that live football commentaries to be broadcast to the patients in additions to church services. York Hospital Radio re-launched in its current form in 1964. It now broadcasts 24 hours a day but they still feature live commentary on York City football club as well as a music requests show plus live productions from York's Theatre Royal and York Minster.

Over the next few years the installations in hospitals throughout the country grew, as did the type of programming they offered. During the 1930s you could expect to be able to listen to live music rather than just speech commentaries.

During World War II it was only Jersey that saw a hospital radio station being installed and that relayed church services, broadcast musical recitals, variety shows, and programmes for children to nine hospitals after wireless receivers had been banned and confiscated by the German occupying authorities.

During the 1950s there was a rapid growth in the number of hospital radio stations in the UK. It was around this time that similar stations opened in Japan, the Netherlands, and the United States. With the advent of the cassette tape in 1963 it became much easier for presenters to record their programmes for playback at a later date.

GETTING UP TO DATE. The number of hospital radio stations probably reached its peak in the 1980s when there were around 700 being operated around the country. Then as smaller hospitals merged, so the number of stations dropped but the stations were usually larger and well staffed with volunteers. Some stations were very fortunate and new studios were built.

Each hospital radio station is independent and they are not centrally organised. Almost all are members of the Hospital Broadcasting

Interviews in 1986.

Hospital Radio Chorley's first broadcast in 1969.

Equipment and broadcasting techniques have come a long way.

Volunteers have always been an important aspect of Hospital Radio.

Daniel O'Donnell at the opening of the Hospital Radio Perth studios in 1994.

Association (HBA), which was set up by stations for their mutual benefit but does not govern or run them. Most in the UK are registered charities; others are part of larger organisations such as hospital Leagues of Friends. Hospital radio stations are staffed and managed by volunteers (more than 2,500 in the UK alone) and usually each volunteer works on a particular weekly programme. Some volunteers broadcast, others work to keep the station's record library or computer systems up-to-date and others provide technical assistance.

LISTEN OUT. Listen out on the air for GB8HBW from 19 March. Other stations will be included in the GB2RS news scripts in the coming weeks as licences are confirmed. If you know of a local Hospital Radio Station and would like to help them to put on such a station, or would just like more information about this planned event, please contact Norman Bland, M0JEC, by e-mail to m0jec@nadars.org.uk – and remember to report back to *RadCom* how successful your special event station was.

KENWOOD
Authorised dealer

Hand-helds
TH-D72E Dual band 2/70cm with GPS & APRS **£429.95**
TH-F7E Dual band 2/70cm RX 0.1-1300MHz **£239.95**
TH-K2ET Single band 2m with 16 button keypad **£169.95**
TH-K2E Single band 2m **£164.95**
TH-K4E Single band 70cm **£164.95**

Mobiles
TM-D710E Dual band 2/70cm with APRS RX 118-524MHz & 800-1300MHz, 50 Watts **£439.95**
TM-V71E Dual band 2/70cm with EchoLink RX 118-524MHz & 800-1300MHz, 50 Watts **£299.95**
TM-271E Single band 2m, 60 Watts **£169.95**

Base
TS-590S HF & 6m 100W all mode transceiver **£1,449.95**
TS-2000X All mode transceiver HF/50/144/430/1200MHz 100 Watts All mode transceiver **£1,799.95**
TS-2000E All mode transceiver HF/50/144/430MHz 100 Watts All mode transceiver **£1,499.95**
TS-480HX HF/6m 200 Watts Transceiver **£879.95**
TS-480SAT HF/6m 100 Watts Transceiver **£779.95**

Accessories
PS-60 25amp power supply unit ideal for the new TS-590S **£309.95**
SP-23 External speaker **£71.95**
SP-50B Mobile speaker **£29.95**
MC-90 Deluxe desk microphone suitable for DSP transceivers **£194.95**
MC-60A Desk microphone with pre-amplifier **£124.95**
HS-5 Deluxe headphones **£54.95**

WOUXUN
Authorised dealer

Handhelds
KG-UVD1P Great value dual band 2/70cm **£91.95**
KG-699E Brilliant single band 4m 44-88MHz **£91.95**
KG-679E Superb single band 2m **£59.95**

Accessories
WO/ELO-001 Battery eliminator **£10.49**
WO/CCO-001 12v Car charger **£10.49**
WO/SMO-001 Speaker microphone **£15.49**
WO/PSO-110 Programming software **£20.49**
WO/CASE Leather case **£10.49**

TYT

Just £49.95

TYT-800 2m 144-146MHz 5 watts 199 channels amazing **£54.95**
TYT TH-UVF1 2/70 5 watts 128 channels **£99.95**

Accessories
TYT-BE Battery eliminator **£14.95**
TYT-SP Speaker microphone **£14.95**
TYT-EP Ear piece **£9.95**

LUITON

Luiton LT-UV Dual band 2/70cm transceiver with FM RX 70-108MHz 5 Watts with 128 memories ..... **just £79.95**

Hand-helds
ICOM
Authorised dealer

IC-E80D D-Star dual band 2/70cm handheld with wideband RX 0.495-999.99MHz **£329.95**
IC-E92D Dual band 2/70cm RX 0.495-999.9MHz with built in DSTAR **£389.95**
IC-E90 Tri band 6/2/70cm RX 0.495-999.9MHz **£239.95**
IC-T70E dual band 2/70cm handheld with 5W Tx & 700mW loud audio **£159.95**
IC-V80E single band 2m handheld with 5.5W Tx & 750mW loud audio **£104.95**

Mobiles
IC-7000 All mode HF/VHF/UHF 1.8-50MHz, 100 Watts output **£1,195.95**

ID-1 Single band 23cm 1240-1300MHz digital and analogue DSTAR transceiver **£719.95**
IC-E2820 + UT123 Dual band 2/70cm with DSTAR fitted, 50 Watts output **£699.95**
IC-E2820 Dual band 2/70cm DSTAR compatable, 50 Watts output **£499.95**
ID-E880 D-Star ready dual band with wide band RX 0.495-999.99MHz **£439.95**
IC-2200H Single band 2m 65 watts **£229.95**

Base
IC-7800 HF/6m All mode 200 Watts Icom flagship radio **£8,799.99**
IC-7700 HF/6m 200 Watts with auto ATU transceiver **£5,999.95**
IC-7600 HF/6m 100 Watts successor to the IC-756 ..... **£3,299.99**
IC-7410 coming soon ..... **£TBA**
IC-7200 HF/VHF 1.8-50MHz RX 0.030-60MHz, 100 Watts output (40w AM) **£839.95**
IC-718 HF 1.8-30MHz RX 300kHz - 29.999MHz, 100 Watt output (40w AM) **£579.95**
IC-910H dual band with optional 23cm, 100 Watts output **£1,299.95**

Accessories
PS-125 25 amp Power supply unit **£419.95**
SM-30 Desktop Microphone designed for SSB and FM **£129.95**
SM-20 600 Ohm 8-pin deluxe base station microphone **£169.95**
SP-10 Mobile 5w speaker 4 Ohms **£54.95**
SP-22 Mobile extension speaker **£34.95**
SP-20 Base station speaker with filters **£184.95**
SP-21 Base station 3w speaker 8 Ohms **£119.95**
SP-23 Base station speaker with built in high and low pass filters **£149.95**

QUANSHENG

TG-UV2 dual band 2/70cm 5 Watts with 200 memories ..... **Only £79.95**

The Quansheng TG-UV2 is a dual band 2m/70cms handheld. It covers 136.00 - 173.995, 400 - 469.995MHz and FM broadcast 88-108MHz. The radio includes 7.2v 2Ah Li-ion battery for extended life. It also comes with AC charger, carry strap and belt clip. This is a very robust radio - don't underestimate its performance from the price!

YAESU
Authorised dealer

Hand-helds
VX-8DE Triband same spec as VX-8E but with enhanced APRS **£369.95**
VX-8GE Dual band with built-in GPS antenna and wideband 100-999.90MHz Rx **£359.95**
VX-7R Tri band 50/144/430MHz RX 0.5-900MHz, 5 Watts outut **£299.95**
VX-6E Dual band 2/70cm RX 1.8-222/420-998MHz, 5 Watts output **£239.95**
FT-60E Dual band 2/70cm RX 108-520/700-999.99MHz, 5 Watts output **£179.95**
VX-3E Dual band 2/70cm RX 0.5-999MHz, 3 Watts output **£159.95**
VX-170E Single band 2m, 16 digit keypad, 5 Watts output **£99.95**
FT-270E Single band 2m, 144-146MHz, 137-174MHz Rx **£99.95**

Mobiles

FT-857D All mode HF/VHF/UHF 1.8-430MHz, 100 Watts output **£669.95**
FT-350E Dual band with Bluetooth, GPS & APRS **£499.95**
FT-8900R Quad band 10/6/2/70cm 28-430MHz, 50 Watts output **£379.95**
FT-8800E Dual band 2/70cm RX 10-999MHz, 50 Watts output **£329.95**
FTM-10E Dual band 2/70cm, 50 Watts output **£349.95**
FT-7900E Dual band 2/70cm 50/40 Watts with wideband RX **£239.95**
FT-2900E Single band 2m 75 Watt heavy duty transceiver **£149.95**
FT-1900E Single band 2m 55 Watt high performance transceiver **£139.95**

Portable
FT-897D HF/VHF/UHF Base/Portable transceiver 1.8-430MHz 100 Watts HF+6, 50 Watts 2M, 20 Watts 70cm **£779.95**
FT-817ND HF/VHF/UHF Backpack Transceiver RX 100kHz – 56MHz 76-154MHz 420-470MHz 5 Watts **£549.95**

Base
FT-DX5000MP Deluxe HF/6m all mode 200W transceiver with 300Hz roofing filter & SM-500 station monitor **£5,395.95**
FT-DX5000D Deluxe HF/6m all mode 200W transceiver with SM-500 station monitor **£4,895.95**
FT-DX5000 HF/6m all mode 200W transceiver **£4,399.95**
FT-2000D HF/6m All mode 200 Watts transceiver RX: 30kHz – 60MHz **£2,999.95**
FT-2000 HF/6m All mode 100 Watts transceiver RX: 30kHz – 60MHz **£2,399.95**
FT-950 HF/6m 100 watt transceiver with DSP & ATU RX 30kHz – 56MHz **£1,299.95**
FT-450AT Compact transceiver with IF DSP and built in ATU, HF+6m 1.8-54MHz, 100 Watts output **£699.95**
FT-450 Compact transceiver with IF DSP, HF+6m 1.8-54MHz, 100 Watts output **£619.95**

Accessories
MD-200A8X Ultra high fidelity desktop microphone **£249.95**
MD-100A8X Deluxe desktop microphone **£129.95**
FP-1030A 25amp continuous power supply unit **£189.95**
SP-2000 Base station external speaker **£194.95**
MLS-100 High power mobile speaker **£34.95**
MLS-200 Compact mobile speaker **£29.95**
ATAS-120A Active tuning antenna system **£279.95**

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

PayPal® We now accept PayPal payments online PayPal®

MOONRAKER Yagi Antennas

All Yagis have high quality gamma match fittings with stainless steel fixings! (excluding YG4-2C)

YG27-4 Dual band 2/70 4 Element (Boom 42") (Gain 6.0dBd) **£59.95**
YG4-2C 2 metre 4 Element (Boom 48") (Gain 7dBd) **£29.95**
YG5-2 2 metre 5 Element (Boom 63") (Gain 10dBd) **£59.95**
YG8-2 2 metre 8 Element (Boom 125") (Gain 12dBd) **£79.95**
YG11-2 2 metre 11 Element (Boom 185") (Gain 13dBd) **£119.95**
YG3-4 4 metre 3 Element (Boom 45") (Gain 8dBd) **£69.95**
YG5-4 4 metre 5 Element (Boom 104") (Gain 10dBd) **£79.95**
YG3-6 6 metre 3 Element (Boom 72") (Gain 7.5dBd) **£69.95**
YG5-6 6 metre 5 Element (Boom 142") (Gain 9.5dBd) **£89.95**
YG13-70 70 cm 13 Element (Boom 76") (Gain 12.5dBd) **£59.95**

MOONRAKER ZL Special Yagi Antennas

The ZL special gives you a massive gain for the smallest boom length ... no wonder they are our best selling yagi's!

ZL5-2 2 Metre 5 Ele, Boom 95cm, Gain 9.5dBd **£59.95**
ZL7-2 2 Metre 7 Ele, Boom 150cm, Gain 12dBd **£69.95**
ZL12-2 2 Metre 12 Ele, Boom 315cm, Gain 9.5dBd **£99.95**
ZL7-70 70cm 7 Ele, Boom 70cm, Gain 11.5dBd **£39.95**
ZL12-70 70cm 12 Ele, Boom 120cm, Gain 14dBd **£49.95**

MOONRAKER HB9CV

Brilliant 2 element beams ... ideal for portable use

HB9-70 70cm (Boom 12") **£24.95**
HB9-2 2 metre (Boom 20") **£29.95**
HB9-4 4 metre (Boom 23") **£39.95**
HB9-6 6 metre (Boom 33") **£49.95**
HB9-10 10 metre (Boom 52") **£69.95**
HB9-627 6/2/70 Triband (Boom 45") **£69.95**

MOONRAKER Halo Loops

Our most popular compact antennas, great base, mobile, portable, or wherever!

HLP-2 2 metre (size approx 300mm square) **£19.95**
HLP-4 4 metre (size approx 600mm square) **£29.95**
HLP-6 6 metre (size approx 800mm square) **£39.95**

MOONRAKER G5RV Wire Antennas

The most popular wire antenna available in different grades to suit every amateur .... All from just £19.95!

G5RV-HSS Standard Half Size Enamelled Version, 51ft Long, 10-40 Metres **£24.95**
G5RV-FSS Standard Full Size Enamelled Version, 102ft Long, 10-80 Metres **£29.95**
G5RV-DSS Standard Double Size Enamelled Version, 204ft Long, 10-160 Metres **£54.95**
G5RV-HSH Half Size Hard Drawn Version, pre-stretched, 51ft Long, 10-40 Metres **£29.95**
G5RV-FSH Full Size Hard Drawn Version, pre-stretched, 102ft Long, 10-80 Metres **£34.95**
G5RV-HSF Half Size Original High Quality Flexweave Version, 51ft Long, 10-40 Metres **£34.95**
G5RV-FSF Full Size Original High Quality Flexweave Version, 102ft Long, 10-80 Metres **£39.95**
G5RV-HSP Half Size Original PVC Coated Flexweave Version, 51ft Long, 10-40 Metres **£39.95**
G5RV-FSP Full Size Original PVC Coated Flexweave Version, 102ft Long, 10-80 Metres **£44.95**
G5RV-HSX Half Size Deluxe Version with 450 Ohm ladder, 51ft Long, 10-40 Metres **£49.95**
G5RV-FSX Full Size Deluxe Version with 450 Ohm ladder, 102ft Long, 10-80 Metres **£54.95**

Accessories

G5RV-IND Convert any half size G5RV to full with these great inductors, adds 8ft on each leg **£24.95**
M8-9 Choke Balun for G5RV to reduce RF Feedback **£39.95**
TSS-1 Pair of stainless steel springs to take the tension out of a G5RV or similar **£19.95**

MOONRAKER Trapped Wire Dipole Antennas

Commercial quality trapped wire dipoles that resonate, so require no ATU!

MDT-6 FREQ:40 & 160m LENGTH: 28m POWER: 1000 Watts **£79.95**
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts **£69.95**
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts **£79.95**
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts **£129.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts **£69.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts **£119.95**

(MTD-5 is a crossed di-pole with 4 legs)

MOONRAKER Multiband Mobile

Why buy loads of different antennas when Moonraker has one to cover all! SPX series has a unique fly lead and socket for quick band changing

SPX-100 9 Band plug n' go portable, 6/10/12/15/17/20/30/40/80m, Length 165cm retracted just 0.5m, Power 50W complete with 38th PL259 or BNC fitting to suit all applications, mobile portable or base ... brilliant! **£44.95**
SPX-200 6 Band plug n' go mobile, 6/10/15/20/40/80m, Length 130cm, Power 120W, 3/8th fitting **£39.95**
SPX-200S 6 Band plug n' go mobile, 6/10/15/20/40/80m, Length 130cm, Power 120W, PL259 fitting **£44.95**
SPX-300 9 Band plug n' go mobile, 6/10/12/15/17/20/30/40/80m, Length 165cm, High Power 200W, 3/8th fitting **£54.95**
SPX-300S 9 Band plug n' go mobile, 6/10/12/15/17/20/30/40/80m, Length 165cm, High Power 200W,PL259 fitting **£59.95**
AMPRO-MB6 6 Band mobile 6/10/15/20/40/80m, length 220cm, 200W, 3/8th fitting, (great for static use or even home base – can tune on four bands at once) **£69.95**
ATOM-AT4 10/6/2/70cm Gain 2m 2.8dBd 70cm 5.5dBd, Length 132cm, PL259 fitting (perfect for FT-8900R) **£59.95**
ATOM-AT5 5 Band mobile 40/15/6/2/70cm, Length just 130cm, 200W (2/70) 120W (40-6M) PL259 fitting, (great antenna, great price and no band changing, one antenna, five bands) **£69.95**
ATOM-AT7 7 Band mobile 40/20/15/10/6/2/70cm, Length just 200cm, 200W (2/70) 120W (40-6M) PL259 fitting, (Brilliant antenna HF to UHF with changeable coils) **£79.95**

DIAMOND ANTENNA Yagi Antennas

Diamond performance from the superb Diamond factory

A502HBR 6m 2 Elements, Power 400W, Gain 6.3dBi, Radial Length 3m **£89.95**
A144S10R 2m 10 Elements, Power 50W, Gain 11.6dBi, Boom Length 2.13m **£84.95**
A144S5RR 2m 5 Elements, Power 50W, Gain 9.1dBi, Boom Length 95cm **£45.95**
A430S15R 70cm 15 Elements, Power 50W, Gain 14.8dBi, Boom Length 224cm **£65.95**
A430S10R 70cm 10 Elements, Power 50W, Gain 13.1dBi, Boom length 119cm. **£49.95**

MOONRAKER HF Mobiles

Get great results with the Moonraker range of HF mobiles ! ... from as little as £17.95!

AMPRO-10 28MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-12 24MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-15 21MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-17 18MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-20 14MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-30 10MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-40 7.0MHz, Length 220cm, 38th fitting (slimline design) **£19.95**
AMPRO-80 3.5MHz, Length 220cm, 38th fitting (slimline design) **£24.95**
AMPRO-160 1.8MHz, Length 220cm, 38th fitting (heavy duty design) **£59.95**
ATOM-20S 14MHz, Length 130cm, PL259 fitting (compact design) **£24.95**
ATOM-40S 7.0MHz, Length 165cm, PL259 fitting (compact design) **£26.95**
ATOM-80S 14MHz, Length 165cm, PL259 fitting (compact design) **£29.95**

MOONRAKER New Ground Plane Free Colinear Verticals

We have always wanted antennas without radials without the compromise of performance – well now you can.

SQBM110P 2/70cm, Gain 3/6dBd, RX:25-2000MHz, Length 100cm, SO239 fitting **£54.95**
SQBM1010P 6/2/70cm, Gain 1.5/2.0/5.0dBd, RX25-2000MHz, Length 140cm, SO239 fitting **£84.95**
SQBM1010N 6/2/70cm, Gain 1.5/2.0/5.0dBd, RX25-2000MHz, Length 140cm, N-Type fitting **£89.95**
SQBM225P 2/70/23cm, Gain 2.5/5.0/8.5dBd, RX25-2000MHz, Length 130cm, SO239 fitting **£79.95**
SQBM225N 2/70/23cm, Gain 2.5/5.0/8.5dBd, RX25-2000MHz, Length 130cm, N-Type fitting **£84.95**

CHAMELEON ANTENNA

The CHAMELEON V1 HF/VHF/UHF Multiband AntennaTM is a revolutionary antenna that stands at a mere 8.5 feet tall and contains a unique trap coil design. This antenna is ideally designed for mobile, portable or base station purposes were limited space is a concern.

Frequency Range: 80/60/40/30/20/17/15/12/11/10/6M + 2M/1.25M/70cm (144MHz - 500MHz) + USAF MARS/CAP (3.3MHz, 4.5MHz & 7.6MHz) **£279.95**

MOONRAKER GP2500

All Band HF Vertical

This is the perfect answer for anyone with limited space and requires no radials. Covering 80 through to 6M with a VSWR below 1.5:1!

Frequency 3.5-57MHz without tuner, Power 250 Watts, Length 7.13M

All at an amazing £229.95!

NEW GP2500F fibreglass version now in stock **£279.95**

MOONRAKER VHF/UHF Mobiles

GF151	Glass Mount 2/70cm, Gain 2.9/4.3dBd, Length 78cm complete with 4m cable and PL259	**£29.95**
MRM-100	MICRO MAG 2/70cm, Gain 0.5/3.0dBd, Length 55cm, 1" magnetic base with 4m coax and BNC	**£19.95**
MR700	2/70cm, Gain 0/3.0dBd, Length 50cm, 3/8 fitting	**£9.95**
MR777	2/70cm, Gain 2.8/4.8dBd, Length 150cm, 3/8 fitting	**£17.95**
MRQ525	2/70cm, Gain 0.5/3.2dBd, Length 43cm, PL259 fitting (high quality)	**£19.95**
MRQ500	2/70cm, Gain 3.2/5.8dBd, Length 95cm, PL259 fitting (high quality)	**£24.95**
MRQ750	2/70cm, Gain 5.5/8.0dBd, Length 150cm, PL259 fitting (high quality)	**£34.95**
MR2 POWER ROD	2/70cm, Gain 3.5/6.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£24.95**
MR3 POWER ROD	2/70cm, Gain 2.0/3.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£29.95**
MRQ800	6/2/70cm Gain 3.0dBi/5.0/7.5dBdBd, Length 150cm, PL259 fitting (high quality)	**£39.95**
MRQ273	2/70/23cm Gain 3.5/5.5/7.5dBdBd, Length 85cm, PL259 fitting (high quality)	**£49.95**

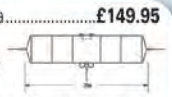
MOONRAKER Dual and Triband Colinear Verticals

Diamond quality – Moonraker prices ! These high gain antennas have been pre-tuned for your convenience, easy to use, easy to install, and a choice of connection ... look no further

SQBM200P	2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, SO239	**£54.95**
SQBM200N	2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, N-Type	**£59.95**
SQBM500P	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, SO239	**£74.95**
SQBM500N	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, N-Type	**£79.95**
SQBM800N	2/70cm, Gain 8.5/12.5dBd, RX 25-2000MHz, Length 520cm, N-Type	**£139.95**
SQBM1000P	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, SO239	**£84.95**
SQBM1000N	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, N-Type	**£89.95**
SQBM223N	2/70/23cm, Gain 4.5/7.5/12.5dBd, RX 25-2000MHz, Length 155cm, N-Type	**£74.95**

MOONRAKER

MTD-300 2-30M Broadband wire dipole antenna **£149.95**



The MTD-300 broadband dipole antenna is designed to provide optimum performance over a wide frequency range and is very easy to assemble and use.

● Frequency 2-30MHz ● Radiator length: 25m (82ft) ● Type: Terminated Folded Dipole ● Radiation: directional ● Feedline: 50 Ohm coax (30m) ● Connector: SO239 ● SWR: <2.0:1 to <3.0:1 depending on factors ● No transmatch required ● Power: 150W (PEP) ● Spreaders: 46cm (18in) ● Weight 3.1kg.

HUSTLER

HF Verticals

Brilliant HF antennas that can be ground mounted if required which in todays limited space is a popular option. Also extra trap tuning is also available to get that perfect match if required.

Hustler 4-BTV 4 Bands 40-10m 1000W Length 6.52m Weight 6.8kg **£179.95**
Hustler 5-BTV 5 Bands 80-10m 1000W Length 7.64m Weight 7.7kg **£219.95**
Hustler 6-BTV 6 Bands 80-10m 1000W Length 7.30m Weight 7.5kg **£259.95**

Moonraker Retail Shop & Mail Order
Cranfield Road, Woburn Sands,
Bucks MK17 8UR
Tel: 01908 281705
Open Mon-Fri 9-5:30pm

Moonraker Satellite Shop
@ M5 Communications
Moto Services Area, Junction 30 M5 South
Exeter EX2 7HF. Tel: 01392 427269
Open Mon-Thur 9-6pm Fri 9-4pm

Antennas

Multiband dipole antennas

PHOTO 1: A practical installation of a multiband dipole constructed from drop feed telephone wire and plastic high pressure water pipe as spacing insulators. The spacing between each of the elements should be about 6cm (just over 2in).

MAKING IT BETTER. I often receive e-mails from readers who have an existing antenna arrangement that is not performing as well as it should, asking if I can advise on a way of effecting an improvement. Recently I received an e-mail from Chris, M0PSK, who was quite happy with the performance of his antenna but wondered why it was so good. He says, "Maybe you could comment on the following questions? I live in a second floor apartment (about 200m from the Mersey estuary) with parallel attic dipoles for 15, 17 and 20m, running NW-SE. The wires are a couple of inches apart and horizontal, maybe a foot below the roof ridge at 38 feet. And there is a common coax feed to a room below the attic.

"The question that intrigues me is this: what is the radiation pattern? Initially, I assumed that it would be the same as those for the individual dipoles. However, I've had around 3,000 QSOs over the last 6 years with this setup, and am surprised at the number of good contacts in the NW-SE directions, as well as the SW-NE directions. My understanding is that computer modelling may not necessarily provide an answer, as the coded algorithms start to break down when the wires get too close. Is it possible that I do have extra lobes in the NW-SE directions?

"There is a secondary question on which I would appreciate advice. It would be physically possible to add further parallel dipoles for 10, 12 and 30m. However, I do not want to degrade the good performance of the existing dipoles. Are any of these extra choices likely to do that?"

DIPOLE POLAR DIAGRAMS. We know that the azimuth polar diagram of a dipole is a figure of 8 with the nulls at the ends of the elements. Some people are surprised when they appear to work stations off the ends of the dipole when some antenna theory books imply that this should not be feasible. The answer can be seen in **Figure 1**. The blue pattern is for the theoretical dipole in free space and shows nulls at the ends of the dipole, over 30dB down on the maximum of 2.2dB relative to isotropic. When the dipole is erected about a wavelength high then the gain increases to 6 or 7dB relative to isotropic (due to ground gain but depending on the quality of the ground) and the nulls fill in to just over -10dB relative to maximum.

But this isn't the end of the story. Any radiation from the feeder or re-radiation from nearby electromagnetic obstructions will further fill in the nulls so that it is impossible to predict how the antenna will perform. So there should be no difficulty in working stations off the ends of the multiband dipole. I maintain that is more important where an antenna is than what it is. It would appear that M0PSK's antenna is in a favourable location, some 38ft above ground.

PHOTO 2: The original two-element beam hybrid quad by TGM Communications.

MULTIBAND DIPOLES. I modelled M0PSK's multiband dipole. The radiation pattern for all dipoles in the multiband structure were very similar. It was not possible to predict any adverse effect on the existing structure when a lower frequency element is added because the environmental effects cannot be modelled. The only solution would be to add the additional element and check the performance of the existing system. I feel sure that added elements will not be harmful.

The method of connecting multiple dipoles is to connect them in parallel as shown in **Figure 2**. I used to think that connecting them at single points and just fanning out the separate elements would do the trick but my attempt at that sort of structure was not successful. The elements are best spaced apart in a parallel manner with insulated spacers and brought to the feedpoint over, say, the last 25cm (10in).

A practical installation is shown in **Photo 1** using drop feed telephone wire for the elements and plastic high-pressure water pipe as spacing insulators. The spacing between each of the elements should be about 6cm (just over 2in) so the arrangement used by M0PSK seems about right.

I started to model this multiband arrangement using EZNEC by creating a basic dipole (I will call this the main dipole) and testing its performance, with and without ground, to obtain the images in Figure 1. I then added an extra band element and made a further check before connecting it to the main dipole and found

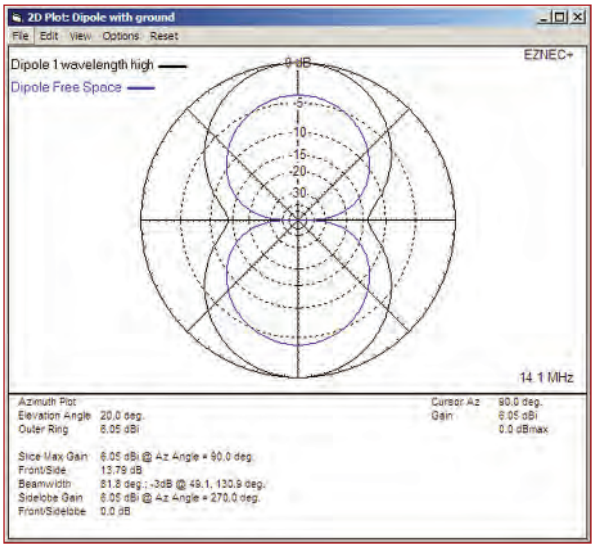


FIGURE 1: Comparison polar diagrams a dipole antenna in free space (blue trace) and the same antenna mounted 10m above ground (black trace), modelled at 20° elevation.

RSGB shop

ARRL Guide to Antenna Tuners — from £15.29

By Joel R. Hallas, W1ZR

The antenna tuner is an often misunderstood device in the Amateur Radio world. While not every station requires an antenna tuner to transmit radio signals, often the incompatibility between the transmitter and the antenna system results in poor performance. An antenna tuner between them is often the way to obtain efficient operation. The *ARRL Guide to Antenna Tuners* has chapters covering topics from the basic "Why Might I Need an Antenna Tuner?", through typical configurations, transmission lines, balanced tuners and antennas that work well with tuners. There are even designs for making your own antenna tuner. If you are seeking to get more from your antenna system this book could well contain the answers.

Size 209x277mm, 160 pages, ISBN 9780-8725-9098-4

Non Members' Price £17.99 **RSGB Members' Price £15.29**

ARRL Antenna Compendium Vol 8 — from £16.14

The most innovative antenna projects yet!

The ARRL publishes in its magazine *QST* some of the best antenna articles in the world and *ARRL Antenna Compendium Volume 8* contains 60 of these articles. The hugely popular *ARRL Antenna Compendium* series features practical ideas, tips and some of the best antenna projects from many well-known authors and this new 8th edition is no exception. This book covers a complete range of topics including portable, directional and omnidirectional antennas for both HF and VHF/UHF. Readers will find articles on the Handy Yagi Antenna, Compact 40 Metre HF Loop, and 20 and 40 Metre Verticals on "Autopilot". You'll also find articles on HF and VHF beams, multiband wire antennas and much more! Simply put, *ARRL Antenna Compendium Volume 8* provides something of interest for every antenna enthusiast!

Size 209x277mm, 224 pages, ISBN 9780-8725-9099-1

Non Members' Price £18.99 **RSGB Members' Price £16.14**

ON4UN's Low Band DXing — from £29.74

By John Devoldere, ON4UN **New Fifth Edition**

25 Years of Low Band Success!

John Devoldere's highly popular book *ON4UN's Low Band DXing* has now been thoroughly updated with lots of new material. You will find many new highlights including a completely revised discussion on receiving antennas and how to greatly enhance their operational bandwidth. There is a new examination of phased arrays, with new concepts such as the hybrid-fed 4-square array and opposite-voltage feed system. This is a must-read for every serious antenna builder! You'll also find low-signal transformers for Beverages and other receive-only antennas, all analysed in great detail, along with effective common-mode filters. There are dozens of new propagation maps based on DX Atlas, as well as an in-depth analysis of the influence of sunspot cycles on 160-metre ducting. Readers will also find a new discussion of cutting edge technology including Software Defined Radio and the revolutionary LP-500 Digital Station Monitor.

ON4UN's Low Band DXing also includes a wide range of topics including chapters on Propagation, DXing on the Low Bands, Receiving and Transmitting Equipment, Antenna Design Software, Antennas: General, Terms, Definitions and The Feed Line and the Antenna. You will also find specific antenna chapters covering, Receiving Antennas, Dipoles, Vertical Antennas, Large Loop Antennas, Yagis and Quads. There are also chapters dedicated to Phased Arrays, Other Arrays, Low Band DXing from a Small Garden and From Low Band DXing to Contesting.

FREE CD

This book includes a CD-ROM with the entire book in a fully searchable PDF format as well as ON4UN's software (Windows XP only), antenna modelling files, photographs and more.

Size 210x274mm, 672 pages, ISBN 9780-8725-9856-0

Non Members' Price £34.99 **RSGB Members' Price £29.74**

POST & PACKAGING FREE
See page 80 for full details

3 Abbey Court, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496
E&OE **All prices shown plus p&p**

Radio Society of Great Britain
www.rsgbshop.org

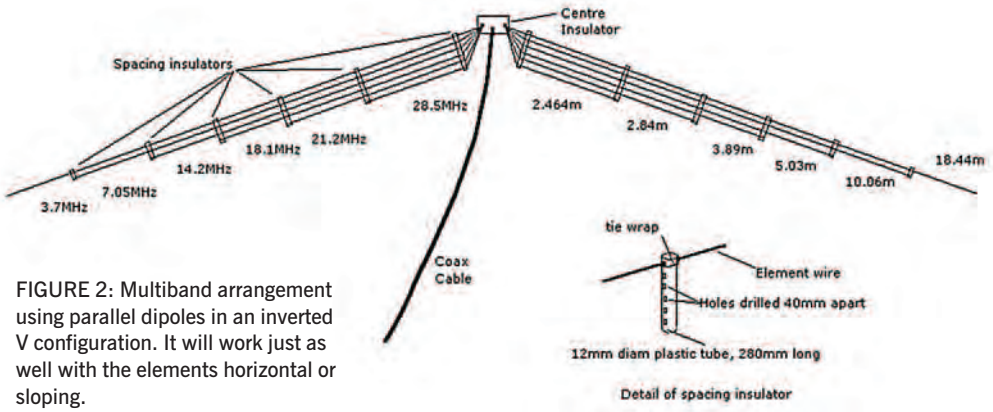


FIGURE 2: Multiband arrangement using parallel dipoles in an inverted V configuration. It will work just as well with the elements horizontal or sloping.

that the antenna exhibited a dual band characteristic. I then added a further band element, again without connecting it to the main dipole. The antenna then had a tri-band characteristic.

In reality this is nothing new and can be found in *The ARRL Antenna Handbook* as the Coupled-Resonator Antenna. I will write about this interesting multiband arrangement in a later Antennas but, in the meantime, I would like to know if anyone out there uses or has used one.

ROTATABLE DIPOLE. While on the subject of dipoles, Steve DeVille, G6TJC, e-mailed me to say "In the November 2010 *RadCom* on page 34, there is a picture of your house showing a rotatable dipole of the roof. May I ask what it is and, assuming you are using it, would it be recommended? I would like to use one as it seems very low profile and neighbour friendly.

This multiband dipole was originally a commercial two-element beam by TGM Communications, called (I think) the MQ-5. It is shown in **Photo 2**. I had this antenna for review. While the SWR characteristics were satisfactory, I found that the F/B directivity was non-existent on the lower frequency bands but reasonable on 10m. Nevertheless, I felt that this arrangement had potential so I bought the antenna after completing the review.

I was not convinced the quad structure was any better than a straight element so I rebuilt the antenna as shown in **Photo 3**. The rebuild included extending the elements and boom and modifying the element end resonators. The object of all this was to hopefully make the directivity adjustment less critical.

In the event the improvement in F/B directivity was not a good as I had hoped but the SWR bandwidth was increased. Furthermore, the antenna performed reasonably well so it stayed up on the chimney for many years, until I did some maintenance work on it in the summer of 2010.

Getting a two-element beam off the roof proved to be problematic for this 78 year old G3 so I reduced it to a dipole by dispensing with the reflector and boom. I removed the silicone compound that covered the element end resonators and inspected the trap inductors, which proved to be in remarkable good shape considering my QTH is only about 400m from the beach. New silicone compound was applied to the resonators and the antenna reinstalled.

The simple dipole antenna was much easier to fix in place, see **Photo 4**. It and performs much the same as it did before removing the reflector. An SWR plot is shown in **Figure 3**. The SWR bandwidth is very narrow at 14MHz and has been tuned to the CW section of the band. It will operate up as the SSB end when used with the internal ATU of my FT-990.

The null at the end of the elements is about 12dB down on the main lobe, which is what you might expect for a dipole in the clear. The only downside it that it picks up electrical noise from the house. I use this multiband dipole as standard for testing other antennas (as described in recent Antennas when comparing it with the multiband quad and the magnetic loop).

In reply to G6TJC's question – would I recommend it? The answer is yes, however at this time I regret I am unable to give constructional details of the resonators. The method I used to modify them was to couple the element to a GDO and adjust the coil turns until the element dipped at the right frequency. I will probably convert the unused reflector into a multi-band dipole when I get the inclination and time and make a note of how it was done.

The only similar dipole I know of is the MFJ-1775, which covers 40 to 10m but not the WARC bands. It also claims to cover the 6 and 2m bands.

FIGURE 3: SWR plot of my multiband dipole measured using the AIM 4170. The impedance plots have been switched off for clarity.

PHOTO 3: The antenna in Photo 2 rebuilt by extending the elements and boom and modifying the element end resonators.

PHOTO 4: The antenna in Photo 3 converted into a multiband dipole by removing the reflector and the boom.

Start Here

Getting started on HF

RadCom is a great source of information about HF; the RSGB also publishes a range of useful books.

THE BASICS. The diversity of the HF bands can make it difficult for newcomers and people returning to the hobby to feel they are getting the most out of their valuable time. To be active on air you need two main things: a radio and an aerial. With a bit of careful thought and budgeting, it's possible to pick up an off the shelf radio that will cover most of your foreseeable needs. Choosing an aerial is much harder, with a wide range of choice and confusion surrounding individual performance capabilities. In January 2010 we looked at what antenna for what band and we encourage you to refer back to that article.

YOUR OPERATING SCHEDULE. At the heart of getting the most out of your amateur radio experience is your operating schedule. By this we don't mean that you plan precise times on the calendar but instead you give some serious thought as to when you are likely to operate. If you can only spare a few hours in the middle of the day, then the bands that are likely to most productive will be significantly different from operating only in the depths of night. Similarly, if your situation means you can't make much noise, eg talking into a microphone, then it's worth considering trying a different mode such as Morse or PSK or maybe to relocate your station, perhaps to a vehicle. After all, if you can only operate at night but can't talk loudly or for longer without disturbing the neighbours/XYL etc then are you getting the most out of the hobby?

WHO WOULD YOU LIKE TO CONTACT? Now it's time to consider who you want to contact – perhaps you want to work exotic DX, maybe hold a regular schedule with someone across the globe or just further away in the UK? Propagation is of course a key factor. The propagation chart in *RadCom* is a useful guide for what could be workable. There are other resources on the web such as www.infotechcomms.net/propcharts that can also help. By knowing who and where you want to try and contact, you can look to buy or build a suitable antenna to help realise this. When you're trying to decide, it's worth looking at the band plans for both the UK and more exotic locations. This way you know where your equipment will need to work in order to achieve your goal. Look for DX windows, where intercontinental QSOs are preferred on HF. If you're considering Morse or data modes then look for the slow speed sections of bands. If you're just starting out, look for sections that are mode specific, for example RTTY and PSK tend to be lower down the band but SSTV tends to be higher up.

PRACTICALITY. By now you've got an idea of what you want to do and have maybe even acquired a radio that covers your interests (and probably the rest of HF) well. Reading the Peter Hart reviews in *RadCom* is a great way to help you decide if a radio does what you want it to do. Now comes the important part: choosing the antenna(s) that suit what you want to do. Maybe this means more than one, perhaps on a tower or maybe hung a few metres above the ground to give high angle radiation. More often than not, this is where we all have to compromise: finding an antenna that covers the bands we want with reasonable performance plus one that actually fits in the back garden without invoking the wrath of the neighbours/council/station manager! This is why antennas such as the G5RV are popular; they give reasonable performance across most of HF when used correctly with an antenna tuning unit, yet they are discrete. If you can't afford to buy an antenna, experimenting with various wire antennas is definitely a good idea. Plenty of designs can be found on the internet and in the amateur radio literature. The RSGB bookshop is a good source for these books. Don't neglect your local club at this stage, either as a source of information or for the chance to try out different equipment.

THE LITTLE THINGS. While a radio and antenna may be the main items of interest, it is often the smaller items that keep a station running smoothly. Unless you're running a single band antenna (the term monobander is usually reserved for Yagi type antennas only), you probably need a good ATU that is capable of handling the power you're running. Similarly, attention to detail in your coax/feed lines will pay off as good quality coax means more of the received signal reaches the radio and less of your transmitted power goes towards heating up the coax. Good quality connectors that are well attached will help ensure you have the best possible setup, even if you're running QRP to a long wire. Keeping the station tidy, avoiding coax running next to the mains power, keeping the microphone cables away from the coax and mains all helps to prevent RF feedback entering your station and creates a safer, more enjoyable operating environment.

PROGRESSING FURTHER. It's somewhat natural once you've found what you enjoy on HF to think about how you could get even more out of the bands. Here, resources such as the amateur literature and the internet can help you decide what the next stage may be. Websites like www.contesting.com provide a great starting point for station improvements and there are numerous discussion forums on www.qrz.com and Yahoo groups. A quick search can start you on the path to sharing ideas with other like-minded enthusiasts both on and off air. Another option is to join a speciality group such as the Chiltern DX Club; you'll find amateurs who share a common goal such as working DX and who are always willing to offer support, ideas and encouragement – with a good few memorable anecdotes thrown in!

Tel: 01922 414796

Established 1997

Radioworld communications

34-42 Brook Lane, Great Wyrley,
Walsall, WS6 6BQ
skype: radioworld_uk
E-mail: sales@radioworld.co.uk
Open six days a week - Mon-Fri 9.00am-5.00pm, Sat 9.30am-4.00pm
http://www.radioworld.co.uk

HF/VHF/UHF transceivers

TM-D710E VHF/UHF mobile ... £448.99.
TS-480SAT - HF&6m 100W..... £743.99.
TS-480HX - HF & 6m 200W.... £849.00.
TS-2000 - HF/6/2/70cms ..... £1475.00.
TS-2000X-HF/6/2/70/23cm... £1665.00.
TM-V7E - 2m/70cm's ..... £375.99.
TH-F7E - 2mtrs/70cm's ..... £233.99.
TM-271E-2m/FM Mobile ..... £172.99.
TM-V71E - VHF/UHF ..... £294.99.
IC-7600 HF 6m transceiver....£3195.00.
IC-7700 HF & 6m Base .....£5995.00.
IC-7800-2 HF/50MHz 200W.....£8875.00.
IC-7200 HF+6m 100w .....£799.00.
IC-7000 - HF/6m/2m/70cm's.....£1119.00.
IC-718 - HF 100W.....£569.00.
IC-910H - 2M 100W/70cm 75W £1275.00.
IC-E91 - Top Flight Handheld....£259.95.
IC-E90 - 2m/6m/70cm Handheld £238.99.
IC-E2820 Dualband VHF/UHF ....£478.99.
ID-E880 2/70 digital mobile .....£433.00.
IC-E92D D/STAR handy ..... £368.00.
IC-V80E 2M handheld ..... £101.50.
ID-1 mobile TRX 23CM/FM..... £713.99.
IC-T70E 2M/70CM Handy ..... £157.99.
IC-E80D D-Star V/U ..... £320.00.
PW-1 HF Amp 1KW ..... £5055.00.
FT-950 HF Transceiver..... £1288.00.
FTM-10E - VHF/UHF tx/rx ... £298.00.
FT-897D - HF/6m/2m/70cm.. £754.99.
FT-817ND - 1.8-430MHz 5W. £509.00.
FT-857D - HF/6m/2m/70cms £658.00.
FT-7900 mobile VHF/UHF ..... £214.99.
FT-8800E - 2m/70cm mobile. £316.99.
FT-8900 - 10m/6m/2m/70cm. £356.99.
FT-1900 - 2m 55W mobile.. £132.99.
FT-2900M - 2m 75W mobile.. £136.99.
VX-7R - 6m/2m/70cm handy. £281.99.
VX-6E - 2m/70cm handheld.. £229.99.
VX-3E - 2m/70cm handheld.. £151.99.
FT-60E - 2m/70cm FM 5W .. £172.99.
FT-450 - HF/6m transceiver. £615.99.
FT-450AT transceiver..... £687.99.
VX-8DE handy with APRS ..... £398.99.
FT-2000 HF/6M Base 100W... £2245.00.
FT-2000D 200W HF/6M Base £2899.00.
FT-DX5000 ..... £4429.00.
FT-DX5000D ..... £4892.00.
FT-DX5000 MP ..... £5400.00.

Transceiver accessories

Yaesu SM-5000 monitor ..... £459.95.
Yaesu SP-2000 speaker ..... £152.99.
Yaesu MD-200 mic ..... £274.99.
Yaesu MD-100 mic ..... £150.99.
Yaesu FC-30 ext. ATU ..... £264.95.
Yaesu FP-30 PSU..... £264.95.
Icom SP-20 speaker ..... £188.99.
Icom SP-21 speaker ..... £106.99.
Icom SM-20 desk mic ..... £153.95.
Icom PS-126 psu ..... £449.95.
Icom PS-125 psu ..... £326.99.
Icom RMK-7000 kit ..... £63.99.
Icom OPC-581 ..... £34.49.
Icom OPC-589 ..... £23.99.
Kenwood SP-23 speaker ..... £71.95.
Kenwood HS-5 headphones ..... £55.99.
Kenwood MC-90 mic ..... £191.99.
Kenwood MC-60 mic ..... £120.00.
Kenwood MC-58DM mic ..... £56.99.
Kenwood MC-43 mic ..... £20.99.

MFJ Enterprises

MFJ-989D 1500W Auto ATU..£389.95
MFJ-986C 3Kw HF.....£349.95
MFJ-993B dual 300/150 Auto £249.95
MFJ-991B Auto Intellituner....£209.95
MFJ-976 1500w ATU £469.95
MFJ-969 300w Rollercoaster £209.95
MFJ-962D 1.5Kw Inductor.....£289.95
MFJ-949E 300w W/D-Load....£179.95
MFJ-948 300w HF.....£159.95
MFJ-945E Mobile £129.95
MFJ-941E 300w £139.95
MFJ-934 ATU+AG £199.95
MFJ-921 2m ATU.....£96.95
MFJ-924 70cms £96.95
MFJ-914 Extender £89.95
MFJ-901B 200w Versa tuner....£109.95
MFJ-1026 Active Antenna £199.95
MFJ-267 Dummy Load / SWR - £159.95
MFJ-802 Field Strength Mtr..... £54.95
MFJ-249B 1.8-170 Dig.....£259.95
MFJ-259B 1.8-170 .....£259.95
MFJ-269 HF/VHF/UHF £349.95
MFJ-201 grid dip meter.....£149.95
MFJ-269PRO 1.8-170&430-520 £379.95
MFJ-250 1kw Oil filled £77.95
MFJ-250X 1KW without oil £55.95
MFJ-260C 300w PL259 .....£44.95
MFJ-260CN 300w N-Type £53.95
MFJ-264 1.5kw PL259 .....£75.95
MFJ-264N 1.5kw N-Type £82.95
MFJ-267 Load/VSWR £159.95

RigExpert ®

AA-500 analyser 5 to 500 MHz .. £562.00.
AA-54 HF ANALYZER ..... TBA.
RigExpert AA-230 ..... £432.95.
AA-230PRO ..... £509.95.
RigExpert AA-30 - HF Analyzer .....TBA.
RigExpert AA-520 Analyzer .....£509.95.
RigExpert Plus .....£220.00.
RigExpert Standard .....£160.00.

HEIL SOUND Microphones & Headsets

PR-781-PTT deluxe base mic...£129.96.
Pro-Set-Plus Headset .....£189.95.
Pro-Set-Plus-IC Headset .....£194.95.
Pro-Set-HC-4/5 Headset .....£114.49.
Pro-Set-HC-IC Headset .....£135.95.
Goldline GM-4 Stick mic .....£119.95.
Goldline GM-5 Stick mic .....£119.95.
Goldline GM-V vintage mic ..... £129.95.
HM-4 Handy mic w/HC-4 insert £59.95.
HM-5 Handy mic w/HC-5 insert £59.95.
HM-IC Handy mic + Icom insert £59.95.
HM-10-4 Hand mic + HC-4 .....£79.95.
HM-10-5 Hand mic + HC-5 .....£79.95.
PR-30 hand microphone ..... £189.95.
PR-40 hand microphone ..... £249.95.
Pro-Set-Elite with HC6 ..... £179.95.
Pro-Set-Elite-IC with HC-6 ..... £194.95.
HM-Pro mic ..... £79.95.
HP-Pro-Plus mic ..... £73.95.
BM-5-5 lightweight single headset £59.95.

COMET

CHA250B broadband vertical, covers 80-6m, no gaps ..... £299.95.
Comet V-250 3.5-54MHz Max 200w. Ideal for limited space ..... £299.95.
GP-6 High Gain Dualband CoLinear 2/70cm Max 200w ..... £99.95.
GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w ..... £99.95.
GP-9 highgain dualband co-linear...£139.95.

Tigertronics

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

WATSON

POWER-MITE NF 22A peak £69.95
W-25AM 25A Supply £89.95
W-10AM 10A Supply £59.95
W-5A 5A Supply £29.95
W-3A 3A Supply £24.95
W-10SM 10A Supply £49.95
W-30 2/70 Base £49.95
W-50 2/70 Base £54.95
W-300 2/70 Base £74.95
W-2000 6/2/70 Base £89.95

butternut

Butternut HF-2V 40/80m £289.95
Butternut HF-6V 80-10m £389.95
Butternut HF-9V 80-6m £449.95
Butternut HF-5B 20-10m £449.95
STR-II radial kit £149.95

HUSTLER

Hustler 5-BTV £219.95
Hustler 4-BTV £179.95
Hustler 6-BTV £259.95
Hustler RM-10 10m resonator £21.99
MO-1 mobile mast section £38.95
MO-2 mobile mast section £38.95
MO-3 mobile mast section £29.95
MO-4 mobile mast section £26.95

PALSTAR

AT-1500DT 1500w ATU £524.95
AT-2K 2000W ATU £579.95
AT- Auto 1500 Watt ATU £1099.95
AT5K 3500 Watt ATU £1079.95
DL-5K 5kw dummy load £419.95

Miracle Antenna

Miracle Whip QRP allband £114.73
Miracle Ducker IL ATU..... £114.73
Miracle Ducker PL for HF £114.73
Miracle Ducker TL HF/VHF/UHF ... £135.60

AT-1000 Pro

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

£506.95

Z-100 Plus

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

£140.99

DM-7800

Made exclusively for the IC-7800. This will give you a true analogue meter

£135.99

AT-100 Pro ..... £188.99.
AT-200Pro ..... £209.99.
AT-897+ ..... £183.99.
KT-100 ..... £168.99.
AT-600Pro ..... £331.99.
YT-450 ..... £224.99.
Z-11ProII ..... £163.99.
YT-100 ..... £171.99.
FT-Meter ..... £40.99.

Z-817 ATU

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

£120

LDG IT-100

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

£162.99

LDG RBA 1:1&4:1

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

£33.99

LDG ELECTRONICS

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

LDG ELECTRONICS

TONNA

Tonna 20505 6m 5el ..... £109.95.
Tonna 20809 2m 9el ..... £74.95.
Tonna 20811 2m 11el ..... £109.95.
Tonna 20817 2m 17el ..... £139.95.
Tonna 20909 70cm 9el ..... £69.95.
Tonna 20919 70cm 19el ..... £89.95.
Tonna 20921 70cm 21el .....£109.95.
Tonna 20635 23cm 35el ..... £89.95.
Tonna 20655 23cm 55el ..... £109.05.
Tonna 20745 13cm 25el ..... £94.95.

West Mountain RADIO

RIGblaster Pro ..... £279.95.
RIGblaster Plus USB ..... £159.95.
M4-CBL RG45/4Pin lead ..... £18.95.
RIGRunner 10way 12v distribution board £149.95.
CBA-III Computerised Battery Analyser ... £139.95.
CBA/AMP/240 CBA-II Amplifier ..... £699.95.
PG-40S 12V Backup Power System ..... £139.95.

DIAMOND

HF10FX 10m Mobile ..... £49.95.
HF15FX 15m Mobile ..... £49.95.
HF20FX 20m Mobile ..... £49.95.
HF40FX 40m Mobile ..... £49.95.
HF80FX 80m Mobile ..... £52.95.
CR8900 10/6/2/70 ..... £97.95.
CP6 Base 6m-80m ..... £339.95.
X50 Base 2/70 ..... £75.95.
X200N Base 2/70 ..... £114.95.
X300 Base 2/70 ..... £139.95.
X7000 Base 2/70/23 ..... £225.95.

AMERITRON

The High Power Specialist

AL-811XCE 10-160m 600w £899.95
AL-811HXCE 10-160m 800w £999.95
ALS600X Solid State 10-160m 600w £1549.95
AL-1500XCE 10-160m 1.5KW £3499.95
AL-1200XCE 10-160m 1.5KW £3429.95
AL-82XCE 10-160m 1.5KW £2729.95

RADIO WORKS

CW-160 160-10m (252ft) £159.95
CWS-160 160-10m (133ft) ... £149.95
CW-80 80-10m (133ft) £129.95
CWS-80 80-10m (66ft) £149.95
CW-40 40-10m (66ft) £119.95
CW-40+ 40-10m (66ft) £139.95
CW-20 20-10m (34ft) £99.95
G5RV+ 80-10m £79.95
G5RV-XF Fullsize £69.95
G5RV-XH Halfsize £54.95

SGC

SGC-230 HF..... £469.95
SGC-500 HF £1499.95
SGC-235 HF-500w £1239.95
SGC-237 HF+6m £309.95
SGC-237 Porta £399.95
SGC-237 PCB £289.95
SGC-239 HF..... £209.95
MAC-200 ..... £289.95

Rotators

G-2800SDX Rotator ..... £1065.00.
G-450C Rotator ..... £306.49.
G-550C Rotator ..... £292.95.
G-650C Rotator ..... £359.00.
G-1000DXC Rotator ..... £439.00.
G-5500C Rotator ..... £562.95.
AR-35X Hy-Gain rotator.....£99.95.

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£129.95 per 100m Drum

RG58U ..... £0.70 per Metre
RG8 Super ..... £1.00 per Metre
RG213 ..... £1.30 per Metre
W103 Westflex ..... £1.95 per Metre
RG-8 100 Metre Drum £69.00
Flexweave 50m Flex £29.95
Flexweave-PVC-50 50m £39.95
Enamelled Copper Wire 50m . £17.95
Hard Drawn Copper Wire 50m £24.95

Rotator Cable: - Color coded Cable
3 core ..... £0.80 per Metre
7 core ..... £1.20 per Metre
8 core ..... £2.00 per Metre

DC Connecting Cable
10A DC Cable ..... £0.50 per Metre
15A DC Cable ..... £0.65 per Metre
25A DC Cable ..... £0.90 per Metre
40A DC Cable ..... £1.35 per Metre

FlexRadio Systems

Software Defined Radios

FLEX-1500 SDR Transceiver... £549.95
FLEX-3000 SDR £1425.32
FLEX-5000A Transceiver £2495.95
FLEX-5000A-ATU £2795.95

Telecom linear amplifiers

Self-contained, solid state

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

Cushcraft

X-7 - 20/15/10 7EL Yagi. .... £899.95.
A3S - 20/15/10 3EL Yagi .....£579.95.
A4S - 20/15/10 Yagi .....£699.95.
A3WS - 12/17 3EL Yagi .....£479.95.
ASL-2010 13-32MHz Log ..£869.95.
MA5B - Mini Beam .....£499.95.
D-3 - 20/15/10 Dipole .....£289.95.
R-6000 - 6Band Vertical ... £429.95.
R-8 - 40-6m Verical .....£549.95.
MA5V - 10/20m Vertical ....£279.95.

Second Hand List

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

Amplifiers
Tokyo Hy-Power HL-50B 80m-6m Linear Amplifier £269.00
Kenwood VB-2200GX 2M Amplifier £79.00
AL-811HXCE Ameritron 800W HF Linear £849
RM KL501 HF AMPLIFIER 1.8 - 30MHz, 300W MAX 600W SSB £210.00
Ampere APB-57A UHF Amplifier £129.00
MML 144/30-LS 2m 30W Amplifier £89.00

Analyzers + SWR meters
Daiwa CN-103L Meter £59.00
W-220 Watson VSWR POWER Meter £39.95
YW-3 SWR meter £30.00
Diamond SX-400 VHF-UHF SWR Meter £70
Harrier SWR-1 SWR & Power Meter £15.00
Oskerblock SWR-200B £49.00
PALSTAR PM2000AM Mobile Watt Meter £120
PM-2000 SWR & PEP Meter £99.00
SMC T3-170L SWR Meter £25.00
KENWOOD SW-100 PWR/SWR METER 140-450MHZ £35.00
TOYO T-430 SWR £39.00
SX-20C Diamond VSWR POWER Meter £59

Antenna Tuners
MFJ-945E Mobile ATU £89.95
MFJ-941E Versa Tuner £99.95
MFJ-994B 600 Watt Auto ATU £275
Yaesu FC-30 Antenna Tuner Unit £169.00
LDG AT-7000 Auto Tuner £129.00
Vectronics VC-300D Tuner with LED PEP Meter £199.00
MFJ-935B Loop Tuner £149.00

Antennae
Mirror Mount £5.00
Sidekick-black Compact Motorised Mobile HF Antenna £299.00
Set top TV antenna £3.00
EZ-TUNE-7000IBOX High Sierra Control box £85.00
Mizuho UZ-77 Active Loop £79.00
Garex Angler Antenna £25.00
SE-1300 Discone £40.00
CX-310A 3-way Coax Switch (SO-239) £55.00
MC-4MT Mobile Cable £13.00

CB
Lodestar SWR-2T SWR Meter £15.00
Emperor Ninja CB £69.00
Lodestar SWR-2S SWR Meter £15.00
CTE-737 50-Watt CB Amplifier £34.95
CB SWR Meter £15.00
Moonraker Minor Plus 80 Channel UK CB £45

DAB Radio
Gemini 46 Digital Radio £39.00
Sony XDR-S55DAB £30.00

Data Comms
Kamtronics KAM Multimode TNC £129.00
USB 56K MODEM £10.00
MFJ-1278b Multimode Data Controller £249

DC/Cig adapter/chargers
CD-24 Ni-MH Battery Charger Adaptor for FT897 £80.00
BC-135 Desktop Rapid Charger £40.00
NC-386 Ni-Cd Battery Charger £20.00

Duplexer / Triplexer
Revex D24 duplexer 1.6-150 MHz £22.00
TSA-6001 Duplexer £25.00

Filters (various)
Bremi BRL-10 - TVI Low Pass filter 27MHz £10.00
AEC LP-30 - Low Pass Filter £15.00
Workman TVI-2K Low Pass Filter £25.00

Handheld Transceivers
Yaesu VX-1R Dual Band Handy £85.00
Icom IC-E92D transceiver £295.00
Alinco DJ-V17E £105.00
FDC-450A 70cm Handheld £79.00
FDC-150A 2m Handheld £79.00
Quansheng 70cm Handheld £79.00
Quansheng 2m Handheld £69.00
FDC Battery £15.00
Yaesu FBA-39 dry cell battery case £15.00
Wouxun KT-689 2m Transceiver £59.00
CSC-90 Soft Case for VX-2E £10.00

HF Transceivers
Icom IC-7400 £899.00
Kenwood TS-50S £399.00
Icom IC-707 Amateur HF transceiver £399.00
Alinco DX-70TH HF & 6m transceiver £399.00
Icom IC-706MkIIG with DSP £599.00
Icom IC-756Pro HF / 6m Transceiver £899.00
Yaesu FT-1000MP / AC HF £799.00
Icom IC-718 HF All Band Transceiver £459.00
IC-756PRO-MKIII Icom HF + 6m Trx £1,699
Yaesu FT DX9000 D Transceiver £6,495.00
IC-7400 HF, 6m & 2m transceiver £899.00
Icom IC-7700 - TRANSCEIVER £4,795.00
Yaesu FT-950 £989.00
Yaesu FT-690R II £275.00
MFJ-993 Automatic ATU 1.8-30MHz 300W SSB, 150W CW £189.00
Yaesu FT-450AT £575.00
Icom IC-7600 £2,700.00

Mics and Speakers
Kenwood MC-60A £84.95
SM-20 Deluxe Base Station Desk Mic £114.95
Icom SP-23 Base Station Speaker £99.00
SMC-34 Speaker/Microphone £20.38
HM-133 Remote Control Mic for IC-E208 £49.32
BH1 NES10-2 DSP Speaker £79.00
extension speaker £9.99
Alinco EMS-14 £49.00
EMS-47 Remote Control Hand Speaker/mic direct VFO in £15.00
Yaesu MH-32 Speaker-Mic £15.00
MFJ-295 £12.95
HM-10-4 Heil Hand mic. with HC-4 insert £60.00
Eagle A069 Earpiece £5.00

Morse keys / tutors
MFJ-418 Pocket Morse Tutor £75.00
Morse Key £89.00
NATO Morse Key £199.00
Ex-Army Key with Operators Unit £39.00
Bencher Twin Paddle Morse Key £89.00
Star-Masterkey CW Keyer £49.95
MFJ-451X Morse Interface (no keyboard) £85.00
MFJ-464 Morse Reader with Built-in Keyer £149

Other
MFJ-704 Low pass filter £39.95
M/Mods 144/100 £149.00
MML432-30L £89.00
EDC-16B adapter £9.99
50-Watt Dummy Load £56.95
TS-711/811PX Interface £59.95
Kenwood YK-88S SSB Filter £49.00
SGC MAC-200 Antenna Controller ATU £220.00
MFJ-461 Pocket Morse Reader £69.00
CX-201 Diecast Coax Switch £10.00
MFJ-784B DSP Filter £219.00
AOR ARD9000 Digital Voice Interface. £126.31
MB-105 (IC-7000) MOBLE MOUNTING BRACKET £7.95
Midland 48 Plus Multi £69.00
MFJ-1817 2m/70cm Telescopic Rubber Duck 36.8cm long £22.00
CSC-83 Soft Carry Case for FT-817ND £15.00
Icom PS-85 Icom 20A Switch Mode £159.00
Kenwood / Trio BPF-2A HF filter £25.00
FL-101 9MHz Filter CW narrow 250Hz £60.00
SC-45 Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
ALINCO ESC-28 £10.00
010-10117-02 Garmin GPS Carry Case £5.00
HS-800/PRO High Sierra Standard Control Box for 180 £75.00
BP-206 Lithium Ion Battery Pack for IC-R-20 & IC-R3 £30.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
Eton S-350 Field Radio £65.00
CSC-88 Soft Case for VX-7R £10.00
Comet CFX514: 50/144/430Mhz £35.00
Bremi BRL-5 - 3-way switch with 5Watt dummy load (52 £20.00
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Mizuho KX-2 antenna coupler £59.00
Yaesu SC-1 Station Console £89.00
Dee Comm Dummy Load £69.00
BRV-1 Mirror Mount £10.00
25W Max Dummy Load £20.00
60W Max Dummy Load £20.78
300W Max Dummy Load £79.00
Antenna Switch £15.00
Aluminium Travel Case £15.00
ESC-29 Leatherette Case for Alinco DJ-X10, DJ-X2000 £12.00
BP-262 Battery Case £7.00
Drake DL-300 Dummy Load £50.00
Revex L20 50 Ohm Dummy Load £25.00
MTU-30/20 RF u-tuning Unit C £300.00
MTU-80/40 RF u-tuning Unit B £300.00
Kenwood LF-30A-N low pass filter fitted with n-type £35.00
Bush Sunrise Radio £49.95
CT-44 Microphone adaptor £10.00
KIF700 Keyboard & Interface £69.00
SC-37 Soft Case £6.00
SC-41 Soft Case £6.00
Diamond DL1000 Load £99.00
DS-8000 Speech Inverter £60.00
CT-5000 CTCSS Board for AR-5000 £60.00
SPECTRUM-MASTER-CD PC Control,data base & more for A £12.00
ICOM HM-175GPS hand microphone £129.00
Icom RS-92 Software and OPC-1799 £49.95

Power supplies
Kenwood PS-30 PSU £89.00
Microset PT 135 PSU £149.00
Yaesu FP-707 PSU £110.00
Icom PS-15 20A power Supply £119.00
Manson EP-925 Power Supply £75.00
PT-1012 Microset 12A 13.5 PSU £110.60
Seif PS-134,DC power supply £20.00
Farnell G-12 £59.00
B.N.O.S 12amp power supply £59.00
Icom IC-PS15 Power Supply £89.00
Manson EP-603 PSU £49.00
Drae 6-Amp PSU £49.00
240V AC to 110V AC Dropper £20.00
Yaesu FP-8 PSU £69.00
Apollo CB-35 PSU £20.00
Micronta PSU £15.00
Skytronic RPS1203 PSU £15.00
Altai RPS-1203 £20.00
Maplin XM22Y PSU £20.00
Maplin XM20W PSU £20.00

Receivers
Icom IC-R72 Receiver £399.00
Kenwood R-2000 Receiver Inc Converter £299
AOR AR8600MkII £499.00
AOR AR-2002 Receiver £199.00
Yaesu FRG-100 HF Receiver £299.00
Icom IC-R5 Receiver £129.00
Icom IC-R8500 Receiver £1,099.00
AOR AR-3000A Wideband Receiver £450.00
AOR AR-3000 Wide Band Receiver £350.00
R-30CC HF PALSTAR HF Rx £499.00
Alinco DJ-X30 Scanning Receiver £125.00
Ten tec RX-320 PC COMMUNICATIONS RECEIVER £275.00
Roberts R-809 £45.00
BlackBox VHF Air-Band receiver £60.00
ABM-1-KIT Ramsey Passive Airband Monitor Kit £60.00
AR-5000A AOR Receiver £1,199.00
IC-EX257 FM Board for IC-R71 £69.00

Scanners
Bearcat UBC-9000 Scanner £179.00
Icom IC-R3 Hand held Scanner £250.00
Bearcat UBC-780XLT £179.00
Realistic Pro-2042 Base Scanner £150.00
GRE PSR-214 FM Base Scanner £99.00
AOR AR-8200Mk3 Scanner £349.00
PSR-282 GRE Handheld Scanner £50.00
UBC-785XLT Base Scanner 25-1300MHz £209
USC-230 Uniden-Bearcat ScanCat 230 £99.00
Uniden UBC-180XLT scanning receiver £99.00
AR-MINI - pocket sized receiver £120.00
FR-100 Handheld Scanner £55.00

Software Defined Radio
Flex-3000 - Software Defined Radio £1,149.00

VHF/UHF Transceivers
Icom IC-490E 70cms Mobile £250.00
Icom IC-910HX 2 / 70 /23cms Base £1,150.00
Kenwood TS-271E £165.00
Kenwood TS-790E 2/70 Base £750.00
FT-290RMKI 2m Multi mode £150.00
Yaesu FT-7800 2/70 mobile £169.00
Icom IC-821H £599.00
Yaesu FT-1500M £129.00
IC-7400 HF, 6m & 2m transceiver £999.00
Yaesu FT-847 Multi-Band Transceiver £899.00
Yaesu FT-857D Multi-band Mobile £539.00
Yaesu FT-690R II 6m transceiver £275.00
Kenwood TM-V7E 2/70 FM Mobile £249.95
Yaesu FT-8800E Dual Band Mobile £259.00
Yaesu FT-480R 2m SSB, CW & FM £220.00
Yaesu FTV-901R 2m/70cm Transverter £275
Yaesu FT-817ND HF 6m VHF UHF 5W £419.00
Kenwood TS-2000 All Mode Multibander £999
Yaesu FT-897D Multiband Portable £649.00
Kenwood TM-702E VHF/UHF £149.00
ICOM IC-2200H 144?146 £189.00
Icom IC-7000 1.8 - 70cms Mobile £849.00
FT-817bhiDSP Yaesu HF/6m/2/70 5W £459.00
The TINY-2 MK-II - £109.00
Kenwood TM-741E - VHF/UHF £229.00
DR-635E Alinco 2m/70cm FM Dual Band £230
Alinco DR-620 remote cables £12.00
ADI AR-146 2m FM Transceiver £89.00
Icom IC-240 2m FM Mobile £59.00

Virtual Radars
AirNav Radarbox 2009 version £299.00

bhi

ANEM amplified module. .....£124.99.
1042 6-way switch box.....£29.99.
NEDSP-1061-KBD DSP module..£101.95.
NEDSP-1062KBD Noise Module.... £106.95.
NEIM1031 Noise Module.....£132.95.
NES10-2 MK III speaker .....£109.95.
1090 Radiomate Keypad.....£91.95.

bhi

PayPal

Tel 01922 414796
Fax 01922 417829
skype radioworld_uk

Stock and prices accurate as of 24/01/2011. E&OE. For accurate, up-to-date prices please check our website before visiting our shop

http://www.radioworld.co.uk

Software Radio in a Nutshell

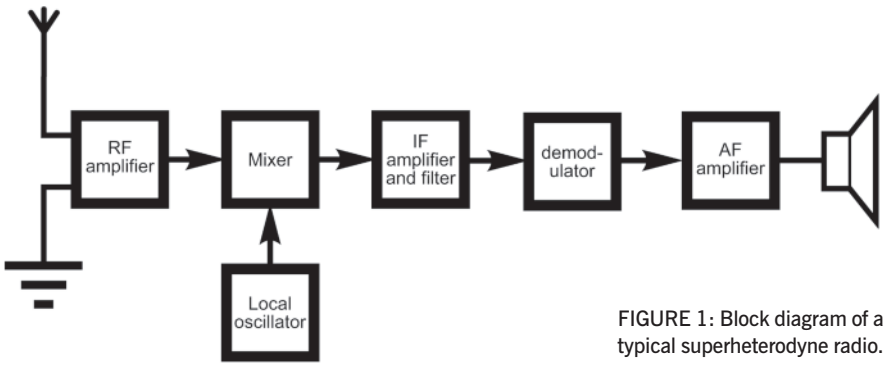


FIGURE 1: Block diagram of a typical superheterodyne radio.

JUST WHAT IS...? Today, many radios are advertised as being a software defined radio (SDR) or having digital signal processing (DSP) technology within them. While DSP is now well established it is helpful to know exactly what DSP is, how it works, and what benefits it can bring. It is also interesting to discover what software radios are and whether they can bring benefits to amateur radio operation.

Effectively, digital signal processing is exactly what it says – processing the radio signals in a digital format. The software radio takes this a large step further – it is completely defined by software – using digital signal processing at its heart, but with the possibility of being able to reconfigure itself to take on board updates, or to perform different functions by changing the software.

To look more into software radios and digital signal processing, it is best to start with the familiar analogue radio and then see how DSP and SDR techniques are implemented.

TRADITIONAL METHODS. Most radios for amateur radio applications use what is called the superheterodyne or superhet principle as shown in **Figure 1**. Here, the incoming signals enter some preliminary amplification and filtering. Then they enter a mixer that multiplies the incoming signal with a locally generated oscillator signal (local oscillator) to convert them to an intermediate frequency, IF section. As the intermediate frequency is fixed, by changing the frequency of the local oscillator signal it is possible to tune the receiver and change the frequency being received.

Within the IF section a variety of functions are undertaken. These include:

- Amplification – the IF is the area of the receiver where the majority of the amplification is provided.
- Filtering – The filters here are designed to accept the station on the required frequency of channel, and to reject those on adjacent frequencies of channels. Again the majority of the adjacent channel rejection is provided within the IF.
- Demodulation – The signals at the end of the IF amplifier stages are still in the form of a radio frequency signal. The modulation must be extracted so that it can be processed either as audio or data.
- Additional frequency conversion – some receivers may have more than one conversion – what is known as a multi-conversion superhet receiver.

DIGITAL SIGNAL PROCESSING. As we have mentioned, digital signal processing is a process whereby signals are processed digitally. How can this happen?

To gain an idea of this it is worth looking at a basic signal – a sine wave. In a normal analogue radio, this would enter the IF strip and be amplified, filtered and demodulated using hardware components including ICs, filters, inductors and the like.

However a sine wave can be expressed mathematically – after all it is based on the Sine function and can be expressed accordingly. The incoming waveform can be sampled at various points and this information can be turned into a mathematical format. Once in this format it can be processed using computing techniques.

In order to perform the digital signal processing calculations, specialised signal processor chips are used. These are optimised to perform the type of calculations used in very fast time – this is required to ensure that the processing is done in real time.

Using digital signal processing techniques it is possible to perform a wide variety of signal processing activities. Not only is it possible to amplify signals but is possible to mix or multiply them to change the frequency. It is possible to demodulate them and also to filter them as well as apply many other functions.

While DSP used to be more expensive, the performance could often be better, and as a result it was widely adopted in high end radios. Now with processing power very much cheaper, most radios utilise some form of DSP.

The performance benefits from DSP arise from the fact that the signals are processed in a purely mathematical environment. The limitations of the hardware can be removed. For example spurious signal paths and imperfect components can be eliminated. However often there are mathematical limitations. For example it is not possible to make the perfect "brick wall" filter, and even the mathematically based filters have some spurious responses, etc, so DSP is not the complete panacea for all ills.

Also as the filter performance is increased, this takes up more processing. This may have an impact on the signal processor itself. One that is required for a complex receiver with high levels of filtering and other functions will need to be much faster and larger than one that is required to undertake much less demanding tasks.

CONVERTING TO DIGITAL FORMAT. Apart from the signal processing itself one of the areas of particular importance in a digital signal processing system is the conversion to and from the digital arena. For the conversion to the digital format, the signal is sampled at regular time intervals, converting the voltage level at that instant into a digital number proportional to the voltage. This process is performed by a circuit called an analogue to digital converter, A to D converter or ADC.

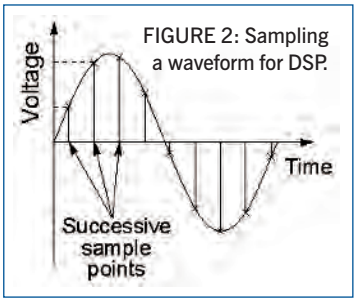


FIGURE 2: Sampling a waveform for DSP.

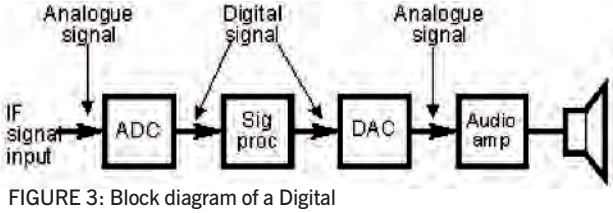


FIGURE 3: Block diagram of a Digital Signal Processor, DSP, with audio output.

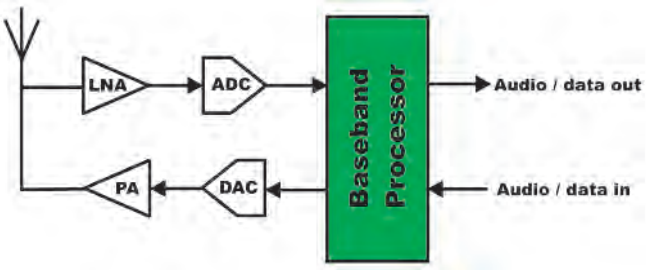


FIGURE 4: The ideal software defined radio.

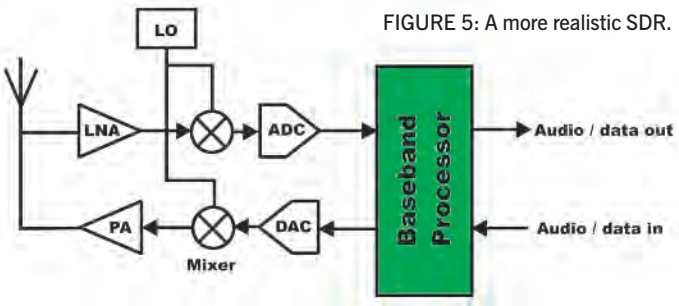


FIGURE 5: A more realistic SDR.

In order that the ADC is presented with a steady voltage while it is taking its sample, a sample and hold circuit is used to sample the voltage just prior to the conversion. This holds the voltage steady while the ADC is performing its analogue to digital conversion. Once the conversion is complete the sample and hold circuit is ready to update the voltage again ready for the next conversion. In this way a succession of samples is made, **Figure 2**.

Once in a digital format the signal processing can be undertaken as mentioned above. However, when this has been completed and the digital format of the output is obtained, this needs to be presented in a format in which it can be used. With many radios today just dealing in digital information, this can be passed straight to a display or other digital interface. However for many radios, the signal will need to be converted back into an analogue format. The circuit that performs this function is not surprisingly called a digital to analogue converter, D to A converter or DAC.

The output from the DAC can then be amplified by an audio amplifier and then presented to headphones of a loudspeaker in the normal way, **Figure 3**.

TRANSMITTERS AS WELL. The same techniques used for a receiver can also be used for transmitters as well – the only real difference being that everything is done in reverse. The baseband signal, ie the microphone is fed into an DAC to convert the signal into a digital format. It is then processed and the signal with the right modulation is generated and fed into a ADC to convert the digital signal into an analogue format. It can then be converted to the correct frequency, amplified and transmitted.

This is actually what happens in many radios today. It enables the advantages of DSP to be used in both receive and transmit.

SOFTWARE DEFINED RADIO. The term software radio or software defined radio, SDR, is now widely used in many radio circles. This term often implies more than just a radio that uses a digital signal processor, or remote control.

As this form of radio is becoming increasingly important in many professional roles from military to cellular telecommunications, a group known as the SDR Forum was set up. With the increase in flexibility of radios, this group has now changed its name to the Wireless Innovation Forum, although it does have some rather unfortunate initials! This group aims to help promote and develop all forms of SDR, as well as other advanced techniques including Cognitive Radio and Dynamic Spectrum Access.

Many definitions have appeared that might cover a definition for a software defined radio. The Wireless Innovation Forum has defined the two main types of radio containing software in the following fashion:

- Software Controlled Radio: Radio in which some or all of the physical functions are software controlled. In other words this type of radio only uses software to provide control of the various functions that are fixed within the radio. It could be controlled by a computer, even remotely operated.
- Software Defined Radio: This is a radio in which some or all of the radio characteristics are defined using software. This means that the software is used to determine the specification of the radio and what it does. If the software within the radio is changed, its performance and function may change. In this way a true SDR has a generic hardware platform on which software runs to provide functions including modulation and demodulation, filtering (including bandwidth changes), and other functions such as frequency selection and if required frequency hopping. By reconfiguring or changing the software, the performance of the radio is changed.

THE IDEAL SOFTWARE RADIO. The ideal software radio would be one that could be used on virtually any frequency and with any type of modulation. To achieve this all that would be needed to change from, for example, an HF transceiver to a UHF transceiver would be a different set of software.

For this to happen, the ADC and DAC functions must be as close to the antenna as possible – ideally there should be no other electronics between the conversion and the antenna as any hardware there may require tuned circuits or have other frequency dependent of signal dependent hardware elements.

In reality this is not completely possible, DACs and ADCs have limitations and, in particular, power and sensitivity limitations. They are also frequency limited, but assuming they could operate within their frequency limitations, the ideal SDR conforms to the block diagram in **Figure 4**.

This is unlikely to be seen, but it is the aiming point for many. A radio of this format would be virtually universal and simply changing the software would change its performance. The more likely format is that the digital conversion will take place at an intermediate frequency with the final conversion to and from the antenna along with the front end and power amplifiers will be present.

SUMMARY. The idea of the SDR has been taken on by a number of areas within industry. The SDR is popular with military organisations, as well as for many cellular telecommunications systems. Here the idea of the SDR enables the radio to be reconfigured purely by loading new software into the radio. This is a particularly attractive idea for example when new cellular standards come out, the same base station hardware can be used, but re-configured using new software – this could be downloaded remotely saving the cost of hardware upgrades and even the engineer visiting the site to perform the upgrades.

For amateur radio as well the concept of the SDR has many applications. It enables radios to be updated more easily, providing the possibilities for continuous improvements. It also enables new types of data communications standards to be incorporated very easily into radios.

Ian Poole is owner and editor of two websites:

Electronics and Radio (www.electronics-radio.com) for hobby electronics including amateur radio and for those studying electronics

Radio-Electronics.com (www.radio-electronics.com) for the electronics industry, providing resources, analysis and news for electronics engineers.

Design Notes

We look at various PLL synthesiser designs

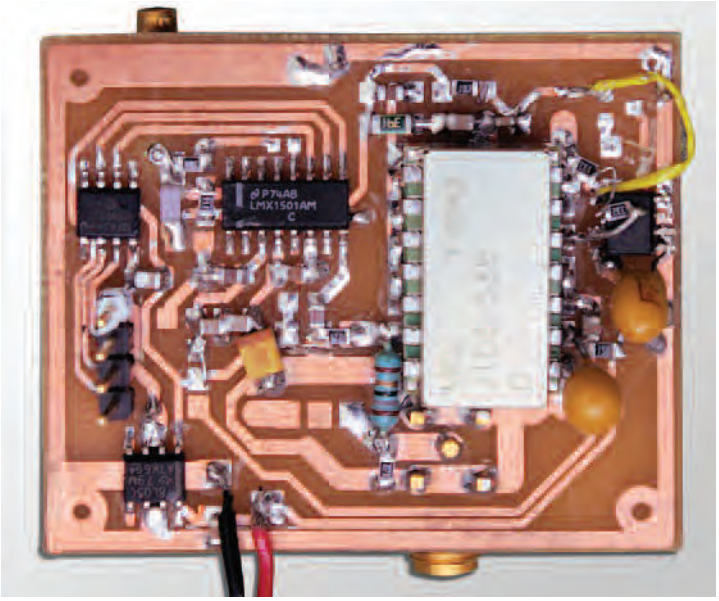


PHOTO 1: UHF synthesiser tuning 320 – 470MHz using a MiniCircuits VCO and LMX1501 chip.

PLL SYNTHESISERS. Synthesisers have been covered in *RadCom* before so we don't need to spend too much time looking at the fundamentals, instead we show how modern off-the-shelf chips can make synthesiser design quite straightforward. The outline of a basic single loop synthesiser is shown in **Figure 1**. A reference oscillator with frequency F_{ref} is divided by a fixed value, R, to give a comparison frequency, F_{comp}. This is applied to one input of a phase/frequency comparator; we'll call this F_r'. A voltage controlled oscillator (VCO) running at a nominal frequency of F_{out} is divided by a value N, chosen to give the same value of F_{comp} when running at exactly the wanted output frequency. We'll call this signal F_c' and connect it to the second input of the phase/frequency detector.

The detector is a special combination of logic gates that gives a permanently high output when F_c' is higher than F_r', and a low level output when the situation is reversed. When F_r' and F_c' are at exactly the same frequency, ie. the loop is locked, the output pulses high or low briefly depending on whether F_r' leads or lags F_c' in phase. When they are exactly coincident the detector output sits open circuit. The detector output is filtered and applied to control the VCO, forcing this to run at exactly a frequency such that

$F_{ref} / R = F_r' = F_c' = F_{out} / N.$
When locked, $F_{out} = F_{ref} * N / R.$

This is the equation for a simple frequency synthesiser. By making F_{comp} a useful fixed value such as 12.5kHz, the VCO can be stepped in frequency by this amount, by changing the value of N, to make a channelised local oscillator. Many of the earlier generation of VHF FM transceivers used just such synthesisers. Any frequency that is a ratio of the integers N / R times the reference input can be generated. In the latest devices, N doesn't even have to be an integer: it can itself be fractional.

SYNTHESISER CHIPS. The simplest synthesiser chips contain just the elements of **Figure 1**. These basic chips are a bit long in the tooth now; they run at relatively low frequencies by modern standards (typically up to VHF or low UHF) and are officially obsolete, making them harder to get hold of from the main suppliers. However, several sources still have plenty of the stock, ideal for many amateur designs. One supplier can be found at **[1]** and devices often appear on eBay. Some of the earliest useful chips are the Motorola MC145xxx family. A few can still be obtained from [1]. See **[2]** for a design based around the MC145170.

The National LMX family is probably the most useful for amateur purposes and range from straightforward UHF devices like the LMX1501 right up to latest state of the art micro-stepped Fractional-N devices. We will concentrate on the simpler ones, still available from [1] and other sources. But first we need to look at the small print.

VARIABLE MODULUS DIVISION. It would be nice if the divider could be simply set by loading one value of N. Unfortunately it is not easy to make a programmable divider operating at UHF to GHz, so the division is usually performed in two stages using a fixed dual ratio prescaler with ratios of P and P+1 (such as 64 and 65) followed by a lower frequency conventional programmable divider. The actual process of dual-modulus prescaling is described in detail in **[3]**. The result is a value of N formed from N = A + B * P, where P is the fixed prescaler value and A and B are user-set values, *but with the proviso that B must be greater than or equal to A*. This does somewhat limit the allowed values for N. Let's say, for example, we want to generate 435.025MHz with a 10MHz input

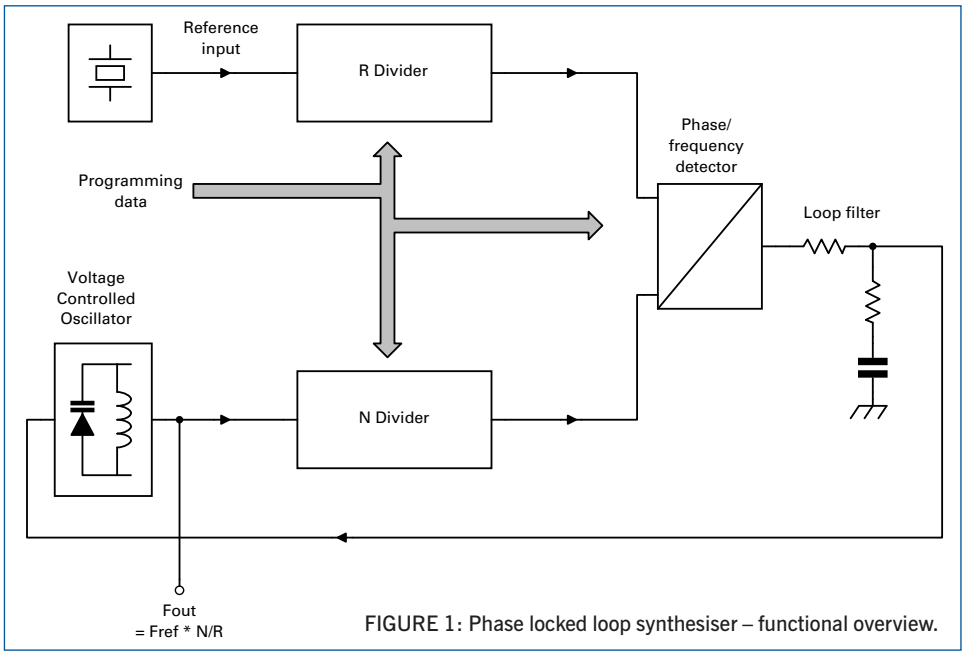


FIGURE 1: Phase locked loop synthesiser – functional overview.

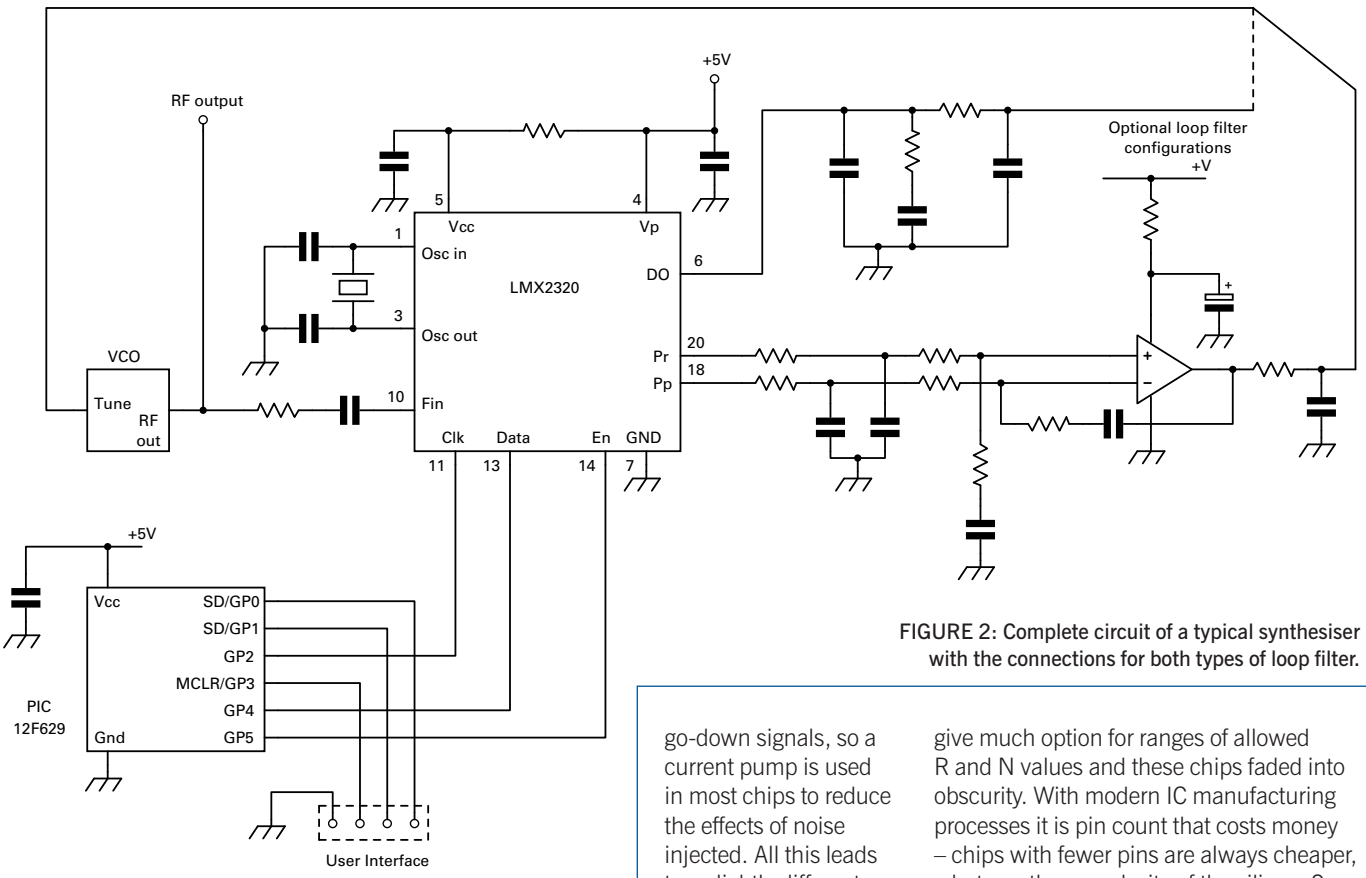


FIGURE 2: Complete circuit of a typical synthesiser with the connections for both types of loop filter.

and a comparison frequency of 25kHz. The value for R is simply 10MHz /25kHz = 400. The value for N = 435.025 / 0.025 = 17401.

With a dual modulus prescaler of 64/65, this can be generated with A = 57 and B = 271 (17401 = 57 + 64 * 271). B is greater than A, so no problem, but what if we had a chip whose dual modulus prescaler was 256/257? For the same output we now need A = 249 and B = 67. A is greater than B so this combination will fail. Many of the later chips allow for this situation by letting the user choose from a range of dual modulus values. For example 128/129, 64/65 or 32/33. Usually one can be made to work if the preferred first choice doesn't.

PHASE DETECTOR. Next item in the small print is the phase/frequency detector. Not all VCOs are designed for positive tuning, ie frequency rises with increasing control voltage. To cater for reversed tuning, the phase detector in most chips can be programmed to swap over the F_r' and F_v' inputs, with a resulting reversal in tuning direction.

A single output from the phase detector with logic high/low level or open circuit is simple and straightforward, with filtering at its simplest being no more than a capacitor and a couple of resistors before going off to control the VCO. But for critical low noise applications this is not ideal. The low impedance voltage driver of a couple of logic gates is not the quietest way of generating go-up and go-down signals, so a current pump is used in most chips to reduce the effects of noise injected. All this leads to a slightly different design of loop filter – a current now has to be turned into a control voltage. But what value of current? Depending on VCO tuning sensitivity, some users may want different current pump settings. Several of the more advanced chips offer a choice of two or sometimes more values of current such as 100 and 500μA.

There is also the current pump/loop filter configuration. A simple one-pin output is fine for the less critical, low component count solutions, but by having two connections from the phase/frequency detector, 'Go-Up' and 'Go-Down' outputs allow a separate, differential op-amp filter to be added, giving more flexibility in choice of components and loop gain with lower injected noise. The circuit of a PLL selectable for both types of loop filter is shown in **Figure 2**. This gives us another choice that has to be made in programming the synthesiser chip. Single or dual ended detector output? Both types of output are available on separate pins in many cases but, where pin count gets tight, the phase detector type has to be set in a control register.

PROGRAMMING THE DEVICE. So, on the simplest PLL chips we now have several registers that have to be programmed to set our synthesiser properly: N, R and sometimes a third, the C(ontrol) register. Back in days of yore, synthesiser chips had multiple pins and registers were programmed by feeding in parallel data, making life simple for home constructors. But even 40 pin devices didn't give much option for ranges of allowed R and N values and these chips faded into obscurity. With modern IC manufacturing processes it is pin count that costs money – chips with fewer pins are always cheaper, whatever the complexity of the silicon. So now most synthesisers are programmed by sending the data on a serial interface. The LMX family devices employ three wires for this purpose: Strobe, Data and Clock There is another, two-wire, protocol called the I^2C bus that is used on devices aimed more at domestic equipment.

The programming procedure is as follows: for each register in turn clock in the requisite number of bits of data then pulse the strobe line briefly to latch the contents internally. The data clocked in includes an address field indicating which register is to be updated. The simpler devices like the LMX1500 and LMX2315 require 18 bits to be clocked in twice, first to set the values into the R register and whether the prescaler should be set for 64/65 or 128/129. The second 18 bits contain the A and B values making up the N divider value. **Figure 3** shows this serial loading procedure graphically. Other devices from the family require a different number of bits to be clocked in, sometimes differing for each register, so look at the data sheet to see the exact requirements in each case.

The serial loading process is ideally suited to a small 8 pin microcontroller such as a PIC, eg the 12F629. The simplest design will just load in the register settings when first turned on. The controller can then go to sleep (quite literally; there is a sleep command within the PIC instruction set). Where operator interaction is needed the PIC could read a set of switches or perhaps respond to a rotary encoder and show the values on a display.

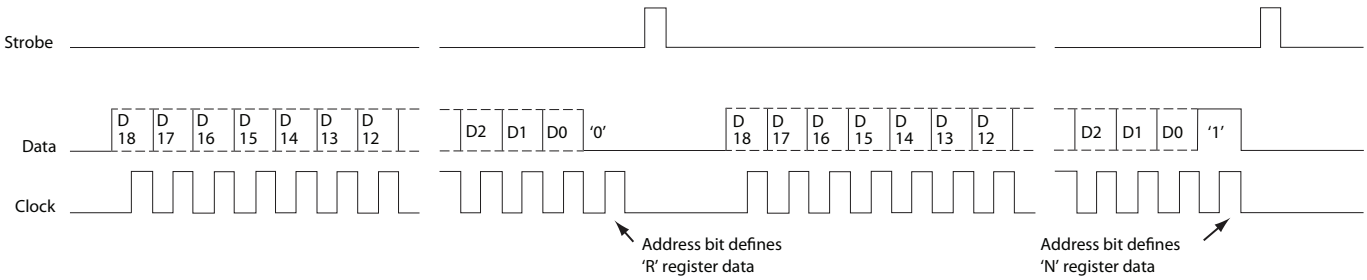


FIGURE 3: Typical serial programming sequence of the registers in a synthesiser chip (two 19 bit words).

TABLE 1: Examples of some synthesiser chips.

Device Type	Max Freq, MHz	Prescaler	B range	R range	Phase Detector options / Notes
LMX1501	1100	64 / 128	3 - 2047	3 - 16383	Polarity pin selected
LMX2315	1200	64 / 128	3 - 2047	3 - 16383	Separate Pins, Polarity pin
LMX2320	2000	64 / 128	3 - 2047	3 - 16383	Separate Pins, Polarity pin
LMX2325	2500	32 / 64	3 - 2047	3 - 16383	Separate Pins, Polarity pin
LMX2306	550	8	3 - 8191	3 - 16383	Function register
LMX2316	1200	32	3 - 8191	3 - 16383	Function register
LMX2326	2800	32	3 - 8191	3 - 16383	Function register
LMX2332 Dual	RF 2500	64 / 128	3 - 2047	3 - 32767	Programmable
"	IF 510	8 / 16	3 - 2047	3 - 32767	Programmable
LMX2434 Dual	RF 5000	16 / 32	3 – 32767	3 - 32767	Programmable current
"	IF 1000	8	3 – 16383	3 - 32767	
LMX2486	3000	-	-	-	Fractional N architecture
MC145170	170	N/A	40 - 65535	5 - 32767	Control Register

As an alternative, the PIC can be used to translate text based characters sent from a terminal or PC on the serial RS232 or USB interface. PIC code for controlling the LMX1500 and LMX2320 devices can be found at **[4]**. It is also intended that a kit with PIC, Rotary encoder and LCD as a general purpose controller, adaptable for several types of device will be made available later this year.

THE REST OF THE PLL. Two areas not covered are the design of the voltage controlled oscillator and the loop filter. Good quality VCO design is a complex subject in its own right, and some details will appear in later issues. A few designs have appeared in this column and *Homebrew* recently. Other VCOs can be found on the web and in printed literature. Packaged VCOs can be purchased as drop-in modules from several suppliers, including MiniCircuits.

Choosing correct component values for the filter, to define loop bandwidth and damping, is critical to optimise stability and phase noise. However, the design process requires little more than dropping numbers into standard equations. National Instruments have made available several examples and design tools, see **[5]**. Most of their datasheets contain the details in a step-by-step guide. A simple spreadsheet that implements these equations can be found at **[6]**.

Table 1 summarises several of the devices in the National Semiconductor LMX family including a dual synthesiser chip for simultaneous RF and IF oscillators and the VHF MC145170 device used in [2].

GOING FURTHER. The LMX2486 uses fractional-N synthesis where the N and R values are changed rapidly between several values, all controlled from within the device itself. With careful loop design the resulting shifts can be smoothed out and an average output frequency obtained that is no longer restricted just to the ratio of two integers. With the increasing difficulty and cost of obtaining good quality crystals these days, this may be the future for amateur microwave sources.

REFERENCES

[1] Useful source of the simpler devices: www.rfmicrowave.it/catalogue.php?lang=eng
[2] Simple VHF Synthesiser: www.g4jnt.com/VHF_Synth_Module.pdf
[3] Dual Modulus Prescaling: http://en.wikipedia.org/wiki/Dual-modulus_prescaler
[4] RS232 to synth chip control PIC code: www.g4jnt.com/pics.htm
[5] National Semiconductor PLLs: www.national.com/AU/files/PLL_Building_Blocks.pdf
[6] PLL Loop Filter Design Spreadsheet: www.g4jnt.com/Download/PLL.XLS

RadioFairs

West London Radio & Electronics Show
Sunday 17th April 2011
The UK's Premier Rally
.....In The South

This Event - Come and meet the experts !

EMC problems and solutions	- Robin Page-Jones,
Getting Licensed	- Whitton ARG
Contesting, getting started	- Steve Knowles G3UFY,
Antenna problems, advice and hints	- Mike Underhill G3LHZ,
Home brew problems	- Terry Giles G4CDY,
Bring in your rig along to get a basic health check	- Martin Charman G4FKK

- New trading Floor Layout and all New Website
- 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 and all Major UK distributors present showing the latest equipment from the Yaesu/Vertex, Kenwood, Icom, Alinco etc.
- Larger area for club stands with local clubs represented.
- Massive Bring and Buy stand

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**

ATV

Upping your output

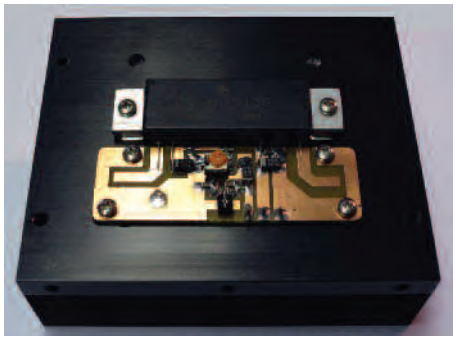


PHOTO 1: A 20W 23cm power amplifier under construction.

EDITED HIGHLIGHTS. There are two main bands most people use for ATV: 23 and 13cm. However, 70cm (digital) and 3cm are very active in some areas of the UK, with a small amount of ATV also on 3.4 and 5.7GHz. I have concentrated on 23cm as this is the most likely band on which a novice will start to operate. Suitable components are readily available, along with ready built units for the 'plug and play' enthusiast **[1]**. As soon as I started writing it was obvious that I don't have space for full construction and test information, so I'm only covering highlights and special points of note.

A 23cm 20W PA. This is a simple DIY design using the Mitsubishi RA18H1213G module **[2]**. Previously the now-obsolete M57762 & M68719 modules were used with a similar PCB. The newer RA18H1213G is more efficient than its predecessors, capable of more RF output and only requiring about 50mW RF drive, making it an ideal companion for the Comtech 23cm Tx module. It's reasonably priced, typically around £50.

Figure 1 is the amplifier circuit diagram and **Photo 1** shows it under construction. The amp is fitted on a 1.4°C/W, 9 fin heatsink. The RF input and output points are laid out for a short semi-rigid or similar coaxial cable to a flying or case-mounted connector. The PCB negative, component overlay and drilling templates are available on request (see e-mail address at top of page).

THE HEAT IS ON. ATV operation tends to have the transmitter on for quite long periods. My GB2RS News broadcast is 'key-down' for at least half an hour – and this is not untypical. Overall amplifier efficiency is about 30% when using a 12.5V supply and RF control bias (V_{GG}) of 5V. At 20W output, this means some 60W of heat has to be dissipated.

In continuous operation, a 0.05°C/W heatsink of 250 x 100mm with 32mm fins such as the Farnell 4106003 would run acceptably warm, about 60°C, given free air circulation. But they cost about £50 plus VAT. The smallest alternative is an ex-computer heatsink of 80 x 80mm with ~50mm fins and a 12V cooling fan (but note that fan failure could result in the RF module being destroyed). Such a heatsink/fan assembly is widely available, eg from [1] and **[2]**, costing about £12.50. A complete and tested 23cm PA is also available from [1]. Refer to **[3]** for a useful heatsink performance calculator.

How you mount and cool the RF module is very important. Thermal heatsink compound must be used between the module and the heatsink surface, which must be very flat to 'reduce bending stress on the ceramic substrate'.

A close look at the RF module interface plate reveals that a large area has been machined away by about 0.09mm 'for stress relief'. However, this notably reduces thermal contact unless a relatively expensive silver-based interface compound is used. There is a proven alternative solution: fill the gap with a shim made from aluminium cooking foil. The most suitable I have found is BacoFoil Classic, which is about 0.025mm thick. Carefully cut a 50 x 68mm piece of Bacofoil. Lightly smear one side with heatsink compound and fold it three times (making 4 layers) so that compound is between each layer. This gives the required shim of 50 x 17 x ~0.1mm. It just needs a further light smear of compound on the two outer surfaces of the shim or the underside of the RF module. Don't forget to coat the mounting ends of the module. After first fitting the PCB to the heatsink, 'stick' the shim into the module recess and screw it down, which must be done before the leads are soldered to the PCB. Two M3 screws are recommended, with a tightening torque of 0.4 to 0.6Nm. The slots for the fixing screws are rather wide. A washer or small plates as seen in **Photo 1** will distribute the fixing screw pressure.

If you do not have a torque driver then the best guidance is that the screws should be hand tight, but not forced. Wipe away any squeezed-out heatsink compound – there shouldn't be much if the shim etc was just lightly coated. The module's four connections can now be carefully bent down, with a slight radius to allow for any temperature expansion, then soldered to the PCB.

ANALOGUE AND DIGITAL OPERATION. For analogue operation, 20W RF output is typically obtained for <100mW input drive with a 12-13V supply and V_{GG} bias (the 1k pot) set to just over 4V. The best approach is to set the bias near zero and increase it whilst measuring the RF output level. (Higher supply voltage or a maximum V_{GG} of 5V will produce up to 30W or more but this tends to reduce the life of the module.) The V_{GG} bias can be disconnected from the main 12.5V supply (point A in Figure 1) and fed from the G0ALU controller previously described to provide a PTT/ no current standby facility for the PA. As you may have surmised, the V_{GG} bias pot (or the supply to it) can be used as a variable 0-20W RF output control for analogue FM operation.

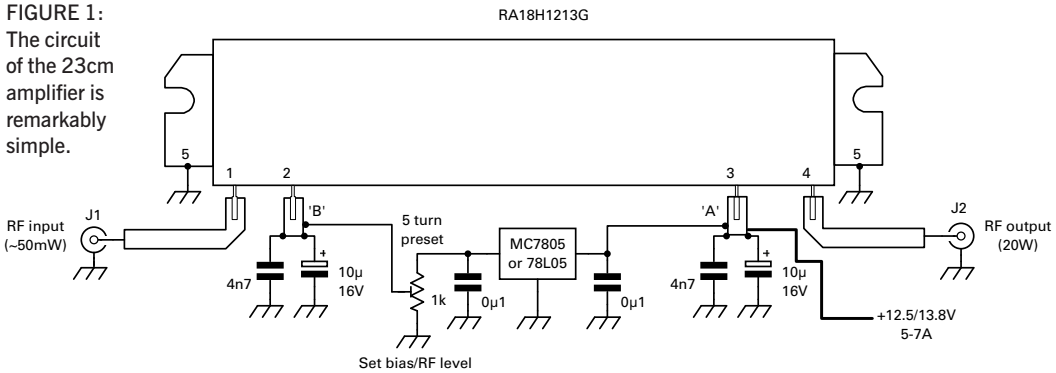
With linear/digital operation, a different approach is required. Mitsubishi recommends V_{GG} be set to the 5V and the input RF level adjusted for best linearity. With a digital signal this would mean that the RF input level is set for a minimum decrease in the 'pyramid steps' of the output spectrum waveform and a minimum increase in 'step top' noise. There will always be a compromise between RF input level, V_{GG} bias and RF output, but 15 to 20W could be achievable. With digital operation, maximum module/heatsink cooling is essential.

CORRECTION. In January 2011, the last line in column 2 should have read, "The information from [6] is a good beginners' introduction…".

WEBSEARCH

[1] www.13cms.co.uk
[2] www.vebox.com
[3] www.mitsubishichips.com
[4] www.frigprim.com/online/natconv_heatsink.html

FIGURE 1: The circuit of the 23cm amplifier is remarkably simple.



KENWOOD

Introducing the NEW TS-590S

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.

Peter Hart confirms that the TS-590 is a real winner!

> "The TS-590S is an excellent all-round radio, packed with really useful features, easy to operate with well thought out and friendly ergonomics. The performance on the key five bands where it is a down-conversion radio is equal to the best radios available but at a fraction of the price."

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

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

FREE Kenwood MC-60a Desk Mic worth £118!

Call now to discuss how I can get this 2010 masterpiece from Kenwood into your shack today!

Available from stock in very limited supply.

Tel:
0345 2300 599
01932 567 333
(local call number)

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

Outline House,
73 Guildford Street,
Chertsey,
Surrey KT16 9AS
E-mail:
sales@hamradio.co.uk

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 4.30pm

ML&S martin lynch & sons

The Wor…ourite Ham Store

20 Celebrating Years

Outline House, 73 Guildford Street,
Chertsey, Surrey KT16 9AS
Tel: 0345 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

New KV-UV920R

Low cost Dual Band, Cross-band Repeat High Performance 2/70 FM mobile Transceiver with wideband receive, remote head etc. **Due early 2011.**

wouxun®

Wouxun KG-UVPD1P 2/70 Full Dual Band FM Handie

- ✓ 5W RF Output 2m & 4W 70cm
- ✓ Frequency Range: 144-146 & 430-440MHz (RX/TX) 136-174 & 420-470MHz Capable
- ✓ Work Mode: V/U or V/V or U/U can be set freely
- ✓ English Voice Guide
- ✓ SOS Function
- ✓ 1750Hz Tone
- ✓ DTMF Encoding Function
- ✓ CTCSS/DCS Scan (Digital/Analog)
- ✓ Bright Flashlight Illumination
- ✓ Band can be set freely on the same Channel VHF TX-UHF RX or UHF TX-VHF RX
- ✓ Built-in FM Radio (76-108MHz RX)
- ✓ Wide/Narrow Bandwidth Selection (25khz/12.5khz)
- ✓ Priority Scan, Add Scanning Channel
- ✓ High/Low Power Selection
- ✓ Channel Name Edit and Display
- ✓ 50 Groups CTSS/105Groups DCS
- ✓ Multi Step Frequency:(5K/6.25K/10K/25K/50K/100K)
- ✓ Multi Scan
- ✓ VOX Transmission
- ✓ Transmit Overtime Voice Prompt
- ✓ Begin/End Transmitting BEEP Prompt
- ✓ Auto/Manual Keypad Lock
- ✓ Wire Clone, Programmable By Computer
- ✓ Stopwatch Function
- ✓ Low Voltage VOICE prompt
- ✓ Busy Channel Lockout

ML&S Price: £92.99

Supplied accessories:
1.3Ah Li-Ion Battery Pack (5W)
Intelligent Base charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap & Handbook

Wouxun KG-679E/2M 2m FM Handie

Also available for 70cm! See below.

- ✓ 5W RF output
- ✓ English voice guide to under 5W RF
- ✓ 144-146MHz 2m Amateur Band (136-174MHz capable)
- ✓ 8 groups scrambler
- ✓ Channel name edit available
- ✓ High/Low power can changeable by top key
- ✓ VOX (Level adjustable)
- ✓ DTMF encoding and DTMF decoding
- ✓ 105 groups D.C.S/50 groups CTCSS
- ✓ DCS/CTCSS of RX and TX can be set respectively
- ✓ Reverse frequency function
- ✓ Busy channel lockout
- ✓ Distant alarm
- ✓ NI (Caller ID)
- ✓ Multi scan mode (TO/CO/SE)
- ✓ Inspection, monitor, stun, kill and emergency alarm
- ✓ All calls, group calls and selective calls
- ✓ Calling ring and ring overtime auto answer
- ✓ Multi silent mode (QT/QTADT/QTXDT)
- ✓ Channel steps (5K/6.25K/10K/12.5K/25K)
- ✓ Wide/Narrow bandwidth selection (25KHz/12.5KHz)

ML&S Prices:

KG 679E/2M..... £59.99
KG-679E/U 70cm
(400-470MHz)..... £59.99

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

Supplied accessories:
1.3Ah Li-Ion Battery pack (5W)
Intelligent Base Charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap
Handbook

Wouxun company's motto is 'Quality first, customer supreme'. To their customers this means they have the most advanced production facilities in the industry and do the most rigorous testing for product quality in order to meet the ISO9001 standard. Founded in 2000 and located in Quanzhou, China.

Wouxun KG-699E/4M 4m FM Handie

- ✓ 5W RF output
- ✓ English voice guide to under 5W RF
- ✓ 70-70.500MHz 4m Amatuer Band (66-88MHz capable)
- ✓ Dual display and standby modes
- ✓ 128 Memory Channels
- ✓ 8 Groups Scrambler
- ✓ Channel Name Edit Available
- ✓ High/Low Power can be changeable by Top Key
- ✓ VOX (Level Adjustable)
- ✓ DTMF Encoding and DTMF Decoding
- ✓ 105 Groups D.C.S/50 Groups CTCSS
- ✓ DCS/CTCSS of RX and TX can be set respectively
- ✓ Reverse FrequencyFunction
- ✓ Busy Channel Lockout
- ✓ Distant Alarm
- ✓ ANI (Caller ID)
- ✓ Multi Scan Mode (TO/CO/SE)
- ✓ Inspection, Monitor, Stun, Kill and Emergency Alarm
- ✓ All Calls, Group Calls and Selective Calls
- ✓ Calling Ring and Ring Overtime Auto Answer
- ✓ Multi Silent Mode (QT/QTADT/QTXDT)
- ✓ Channel Steps (5K/6.25K/10K/12.5K/25K)
- ✓ Wide/Narrow Bandwidth Selection (25KHz/12.5KHz)

ML&S Price: £92.99

Supplied accessories:
1.3Ah Li-Ion Battery Pack (5W)
Intelligent Base Charger (110V-240V & 12V in input)
Belt-Clip
Dualband Antenna
Hand Strap
Handbook

www.wouxun.co.uk

Don't forget Wouxun have a complete range of Handies available for Commercial, Marine and Ham. Call for details.

WO/BLO-004 1700mAh Li-ion BatteryPack £19.99

WO/BAO-001 'AA' Battery Pack £9.99

WO/ELO-001 Eliminator £9.99

WO/CCO-001 Car charger £9.99

WO/SMO-001 Mic/Speaker £14.99

WO/PSO-110 Programming Software and USB Programming Cable £19.99

WO/CASE Leatherette case £9.99

WO/AAO-002 BNC Socket to SMA plug antenna adapter £4.99

WO/AAO-001 SO-239 socket to SMA plug antenna adapter £4.99

WO/CHO-004 110-234v AC & 13.8v DC spare charger (allows radio & spare battery to be charged at same time) £22.95

WO/CHO-006 Six-way charger £149.99

Full range of Nifty Equipment Manuals and Quick Reference Cards for Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios available from stock.

New! Solid State Amplifiers from RM!

BLA-1000
Flagship 1kW key down all mode HF Linear Amplifier with built in PSU.

Full range now in store. See web for details.

FACTORY APPOINTED DEALER for FLEX

The entire FLEX Range is now on demonstration in the ML&S Super Store!

Flex 1500 SDR Low cost SDR Transceiver, connect via USB & you have 5W 160-6m! £599.95
Flex 3000 with ATU 100 Watt SDR 160-6m with Auto ATU fitted. £1299.95
Flex 5000A Flagship 100W SDR Base 160-6m £2495.95
Flex 5000A-ATU Same as 5000A but built-in Auto ATU £2795.95
Flex 5000A-ATU+Twin RX as above but with second receiver £3434.95

ICOM

Icom HF Products

IC-718	Basic HF Radio, 12V, 100W output	£539.95 (whilst stocks last)
IC-7200	Mr T's choice for tough HF/6M Operation	£837.39
IC-7000	Full DSP, TFT Screen, 100W HF/6m + 2/70	£1189.95
IC-7600	100W, Twin RX, Huge Display. No psu	£3299.95
IC-7700	Superb 200W HF/6M Base, PSU/ATU	OUR DEMO BOXED etc £5395
IC-7800	Icom's Flagship radio has gone up again	£Call! - we usually have immaculate used available.
IC-PW1Euro	1kW Fully automatic HF/6m Linear Amp	£Call!!

Icom Receivers

IC-R9500	Flagship Base Receiver, 50kHz-3335MHz	£Call!!

Icom V/U Products

IC-V80E	**NEW** 2m Handie 5W	£105.00
IC-T70E	**NEW** 2/70 Dual band Handie 5W, compact	£158.25
IC-E80D	**NEW** D-Star Handie 500kHz-1GHz, RX built in	£329.95
ID-E880E	**NEW** D-Star Mobile. D-Star as standard	£439.10
IC-E90	6/2/70 FM handie	£239.95
IC-E90/4m	6/4/2/70 version of this popular handie	£299.95
IC-E92ED	As above c/w D-Star fitted & splash–proof	£388.95
IC-E2820	Proper dual band, dual display, remote etc	£489.95
IC-E2820+D	Supplied with UT-123 D-Star board	£649.95 (whilst stocks last)
IC-910H	Multimode 2/70 Base Station	£1296.96
IC-910X	As above but with optional 23cm UX-910	£1549.95

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

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

- HF/50MHz 144/430(440)MHz & 1200MHz coverage
- SSB, CW, RTTY, AM, FM & DV modes
- 100W on HF/50/144MHz, 75W on 430(440)MHz. 10W on 1200MHz
- 32-bit floating point DSP & 24-bit AD/DA converter
- Double superheterodyne with image rejection mixer
- Optional 3kHz/6kHz 1st IF (roofing) filters (for HF/50MHz bands)
- Satellite mode operation
- Optional D-STAR DV mode operation

Icom IC-7600 £3299.95

This new Mid-range HF base station from Icom has arguably the best screen for user interface in the business. Successor to the IC-756Pro3.

KENWOOD

AVAILABLE FROM STOCK £1489.95

New TS-590S HF/6m Transceiver

FREE MC-60A DESK MIC worth £118!
Peter Hart says: "I found the radio friendly, intuitive & easy to use"
For further information see our website: www.hamradio.co.uk

TS-2000X

Flagship HF-23cm All Mode Base Station.
This really is a total shack in a box.

SPECIAL OFFER ONLY £1679.95

Kenwood HF Products

TS-480SAT	Remote head HF/6m 100W inc ATU Transceiver	£779.95
TS-480HX	200Watt version of above, no auto-ATU	£879.95
TS-2000E	100Watt all mode HF/2/6M with auto-ATU etc	£1439.95
TS-2000X	As above but fitted with 10Watts on 23cm (all mode)	£1779.95

Kenwood V/U Products

TH-F7E	The only 2/70 FM Handie with SSB/CW WB Receiver	£235.95
TM-V71E	First Class 2/70 FM Mobile with remote head	£299.95
TM-D710E	The only 2/70 FM Mobile/Base with APRS/TNC etc	£445.95

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

DV-AP-Dongle

The DV Access Point Dongle, (DVAP for short) by Internet Labs, provides a way to connect to the international D-Star network. The DVAP is used with a PC/Mac and an Internet connection. Unlike the DV Dongle, the new product allows amateur radio operators to walk away from the computer and transmit/receive D-Star voice and data using a two meter D-Star radio. Note that a D-Star radio is required to communicate with the DVAP and an Internet connection is required to communicate with the D-Star network. **NOW IN STOCK! £219.95.**

DV-Dongle

The DV Dongle connects to your PC or Apple Mac via a USB port and provides encoding and decoding of compressed audio using the DVSI AMBE2000 full duplex vocoder DSP chip. AMBE technology is used in all D-Star radios to provide efficient voice transmissions. It is also used in some HF digital protocols by vendors like AOR. The DVTool application used with the DV Dongle may be installed and run on Microsoft Windows XP/Vista, Mac OS X Leopard, or many flavors of Linux.
In stock, works with MAC or PC. £199.95

New! MyDEL ML-5189 4m 25W FM Mobile.
Only £149.99

Palstar AT-2KP
The combination of affordable pricing and high quality construction and performance makes this the tuner of choice for many Hams. Only £449.95

Palstar

AT-500 600W PEP Antenna Tuner	Special Price	£349.95
AT-1500DT 1500W Differential Antenna Tuner		£449.95
AT-2KP (2000W) Antenna Tuner		£449.95
NEW AT-2KD The AT-1500DT and the AT-1KP have been combined into a new 2Kw Tuner		£449.95
AT-4K (2.5kW) Antenna Tuner		£789.95
AT-5K (3.5kW) Antenna Tuner		£999.95
BT-1500A Balanced Antenna Tuner		£589.95
PM-2000AM Power/SWR Meter		£159.95

Palstar Dummy Loads

DL-1500 (1.5KW)	£119.95
DL-2K (2kW)	£229.95
DL-5K (5kW)	£379.95

Palstar R30A Receiver
Palstar R30A, fitted Collins filters for SSB & AM £649.95

MW550P Active preselector & ATU for AM & 160M reception £259.95
SP30 Matching Desk Speaker £69.95
AA30 Active Antenna Matcher 300kHz-30MHz £109.95

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

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

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

New! GAP Antennas Available from stock

GAP

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

AirNav Systems
The Most Trusted Name In Flight Tracking

The New RadarBox is now available from ML&S!

Radar Box-3D £489.00
Radar Box-Pro £399.00

There is more excitement amongst RadarBox users and potential users now that the 3D version of the RadarBox is now available. This radical software upgrade brings to life the RadarBox with superbly detailed Google Earth mapping overlay. This is a major advantage that puts RadarBox firmly on top of it's competitors. Just look at these crisp, clear screenshots with the pictures of the aircraft in 3D and their precise position shown on the map. RadarBox has always given the best graphics of any system, and this latest addition really underlines the superiority of RadarBox. Known as RADARBOX-3D this complete system is available from all good communications dealers around the world. There is also an upgrade disc available for all existing users of RADARBOX-PRO, order this upgrade as RADARBOX-UG. RADARBOX-PRO is still available for those users who want a radar decoder without Google Earth and 3D.

NEW AT ML&S

ML&S have installed three 42" Hi-Res monitors to demonstrate Virtual Radar and SDR receivers. When you are next passing Chertsey, pop in for a demonstration.

See web site for full specifications

Wonder Wand Antennas U.K.

The UK's favourite rig-mounted antenna system

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

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

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

Isotron!

The most compact 1kW HF Antenna ever!

After 30 years of manufacture and Hot from the USA, these very clever compact antennas are available for all the HF bands. They are easy, quick and simple to install. Tunes & performs without radials or antenna tuners.

The full range can be viewed on our web-site and prices start from only £105 through to £265 for the "Combo's".

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

HUSTLER

Base Station Range
Free standing, max 7.3m tall, 1kW
4-BTV 40/20/15/10m £183.78
5-BTV 80/40/20/15/10m £224.63
6-BTV 80/40/30/20/15/10m £265.48

Mobile Range
200W or 1kW, both stocked. RM10 to RM-80 10M to 80m single-band whips. £24.95 to £56.95
The full mobile and base range and accessories available from stock, including the high power 1kW mobile range.

The DX Engineering DXE-AOK-17M kit adds 17 meter coverage to the Hustler BTV series of vertical antennas without giving up any existing band coverage. This kit will operate across the entire 17m band with an SWR of 1.5:1 or less.

No disassembly of the existing antenna is required, simply bolt this kit over the 10m trap, make some minimal tuning adjustments and you're on the air with an additional band..... **£71.44**

HF Linear Amplifiers

Yaesu VL-1000 Quadra £4099.95
Icom IC-PW1Euro £4145.95
Ameritron ALH-811HXCE £919.95
Linear Amp Ranger 811HXCE £1295.95
Linear Amp Ranger 572B £1395.95
Linear Amp Challenger Mk1V £2449.95

COMET

Comet SWR/Power Meter
CMX 2300 2 separate SWR/Power Meters in one box! ... £153.21

Comet Antenna Tuner
CAT-300 300W Antenna Tuner £194.08

Comet Wide-Band Vertical
NEW! Comet CHA 250BKII
80m to 6m with no ATU and no gaps £299.95

Comet Rotary Dipole
H-422 4 Band trapped dipole £275.82

Comet HF/VHF/UHF Base Antennas

CWA1000	80,40,20,15,10 trapped dipole	£99.95
GP1	144/430 MHz 3.0 / 6.0dbi 1.25m	£59.95
GP3	144/430 MHz 4.5 / 7.2dbi 1.78m	£69.95
GP6	144/430 MHz 6.5 / 9.0dbi 3.07m	£99.95
GP9	144/430 MHz 8.5 / 11.9dbi 5.15m	£139.95
GP15N	50/144/430 MHz 3/6.2/8.6dbi 2.42m	£99.95
GP98	144/430/1200 MHz 2.94m long	£139.01

Comet Handy Antennas

BNC-750	BNC HF whip 7-50MHz TX/RX	£81.69
CH32	BNC 144/433/900Mhz 45mm	£20.39
CH-99	BNC Tel Whip 70-1000MHz 195-1135mm L	£20.38
CHF816	16 3.5/28/50MHz 74cmL 10W/Yaesu FT817	£51.03
RX5	144/430/900MHz 44cm L 8W SMA	£30.60
RX7	144/430/900MHz 44cm L 8W BNC	£30.60
SH95	144/430/1200MHz 37cm L 10W BNC	£30.60
SMA3	144/430/900MHz 25cm L 10W SMA	£25.50
SMA99	70-1000MHz 1.1mm max L Tele SMA	£17.32

Comet Duplexers

CF360A	28/50MHz w/leads SO239 - PL259/PL259	£40.82
CF416A	44/430MHz w/leads SO239 PL259/PL259	£35.71
CF416B	144/430MHz w/leads SO239 PL259/N male	£35.71
CF503C	50/144MHz Sockets SO239 - PL259/PL259	£45.93
CF530C	50/144MHz w/leads SO239 - PL259/PL259	£45.93
CF530A	50/430MHz w/lead PL259 SO239/SO239	£40.825
CF4160B	144/430MHz Sockets SO239 PL259/PL259	£33.66

Comet Triplexers

CFX431A	144/430/1200MHz N socket/PL259/N/N	£51.03
CFX514N	50/144/430/MHz SO239/PL259/PL259/N	£51.03

Miracle Antenna

MMD-17 17M MIXED MODE DIPOLE + 5 BANDS WITH ATU £92.95
MMD-20 20M MIXED MODE DIPOLE, OTHER BANDS WITH ATU £89.95
MMD-30 30M MIXED MODE DIPOLE £99.95
MMD-40 40M MIXED MODE DIPOLE £99.95

Miracle Ducker iLHF-70cm Mini ATU with BNC £109.95
Miracle DuckerHF-70cm with PL-259 ..... £109.95
Miracle AntennaHF-70cm fitted with telescopic £109.95

DX Engineering Products stocked at ML&S!

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

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

Base Antennas

X-30	2/70, 3/5.5dB, 1.3m Long	£69.95
X-50N	2/70, 4.5/7.2dB, 1.7m Long	£75.95
X-300	2/70, 6.5/9dB, 3.1m Long	£129.95
X-7000	2/70/23, 8.3/11.7/13.7dB 5m Long	£225.95
V-2000	6/2/70, 2.15/6.2/8.4dB, 2.5m Long	£109.95

Mobile Antennas

NR-770R	100W, 2/70, 3/5.5dB, .98m Long	£35.71
NR-770RSP	As above but spring loaded	£40.82
NR-7900	2/70, 3.2/6.4dB, 1.46m Long	£51.04

Duplexers/Triplexers

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

DIAMOND

Switches

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

SWR/PWR Meters

SX-100	1.6-60 MHz, 30W-300W-3KW	£132.78
SX-200	1.8-200 MHz, 5-20-200 Watts	£91.91
SX-1000	1.8-1300 MHz, 5-20-200 Watts	£230.87
SX-40C	144-470MHz X needle Mobile Meter	£88.85
SX-20C	3.5-150MHz X needle Mobile Meter	£88.85
SX-27P	COMPACT 144/430, 60W Portable Meter	£45.93

Huge selection of Diamond products always available ex-stock.

NISSEI

One of the oldest names in Ham Radio

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

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

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

MyDEL POWER SUPPLIES

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

New MyDel MP-30SW11

13.8V DC variable, metered, with rear facing terminals. Small, compact and very lightweight. **Only £84.95**

MP-925. £99.95
Linear PSU (Not Switch mode) 25-30Amps, 13.8V DC Variable, Metered with low current terminals for accessories. DC power supply.

MP-6A. £29.95
13.8V DC, 6A power supply.
Ideal for FT-817ND or most handhelds.

MP-8230 As used by CDXC. £69.95
13.8V DC, 25A power supply, switch mode.
Best Seller!

MP-9626. £299.95
"The Brick"
120A, 13.8V DC power supply, switch mode.

MP-9600. £179.95
60A switch mode power supply.
Ideal for TS-480HX or other 200W output radio.

Alinco DM-330MW PSU. £99.95
The Alinco DM-330MW is a 30 AMP switch mode power supply. It is ideal for mobile/portable with its light weight and low noise.

Yaesu FP-1030A Linear PSU. £169.95
25-30Amp 13.8V fixed DC PSU, Twin meters, near silent running. 2 year Warranty

LDG

LDG Auto Tuner Range

NEW! YT-450	Auto Tuner for the FT-450 & FT-950	£224.63
NEW! YT-847	Want a really good Auto ATU for your FT-847? Here it is!	£224.63
NEW AT-600pro	600W Auto ATU	£336.97
AT-100proII NEW	Desktop tuner covering all frequencies from 1.8-54 MHz	£204.20
AT-200pro	Designed for new generation of rigs	£219.52
AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ohms	£521.82
AT-897Plus	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too!	£187.85
IT-100	New version of the AT-7000	£163.35
YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£177.65
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£125.57
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£145.99
Z-11ProII NEW	Portable compact & tunes 100mW to 125W	£163.35
RCA-14	4-way DC Breakout Box	£52.12
KT-100	Dedicated tuner for Kenwood radios	£173.57
RBA-1:1	Probably the best 1:1balun out there	£35.69
RBA 4:1	Probably the best 4:1 balun out there	£35.69
FT-Meter	Neat Analogue back-lit Meter for FT-897/857. S-meter, TX Pwr, ALC Etc	£45.95
NEW FTL- Meter	Jumbo version of the famous FT-Meter	£79.95

Yaesu Rotators

The best available at very special prices.

Only £319.95

G-450C The most popular medium duty rotator available today. ML&S always guarantee to have the largest stocks in the UK and of course the best prices. Cable extra.

G-550 Elevation rotator for satellite operation £299.95

G-5500 Heavy-Duty PC Controlled Vertical rotator for satellite and EME applications £589.95

G-650C Medium duty with higher brake torque than the G-450 ..... £359.95

G-1000DXC This new, high-performance rotator is ideal for heavy-duty applications. Its slim-line constructions is ideal for many crank-up tower installations. Rotation range: 450°, with presets £429.95

G-2800DXC Yaesu's top-of-the-line rotator is for extra-heavy-duty antenna installations. It includes Auto Slow Start and Auto Slow Stop features to avoid sharp jolts to the antenna array and tower. The G-2800A includes a mast clamp to simplify installation. Total rotation range: 450°, with presets £859.95

For the full range of the worlds most reliable Yaesu Rotator products, see our website.

Microbit RRC-1258mkIIS

A complete remote control system for Amateur radio.
Microbit1258mkIIS: £399.95. Leads included.
For more info see
www.hamradio.co.uk/rrc-1258.shtml

NEW VERSION OLD PRICE £399.95 NEW

A new version of the RRC-1258MkII which support Rigs with dual receivers is now available and will replace the existing RRC. Remote your rig anywhere in the world where you have an internet connection.

NEW Mini VNAPro Now with Bluetooth!

Only £349.95

The new miniVNA PRO, the big brother of the well-known miniVNA, is an extraordinary and unique handheld vector network analyzer that makes available a multitude of new features and capabilities which are perfect for checking antennas and RF circuits for hams and commercial users.

MiniVNA original still available (without Bluetooth): £259.95

Tigertronics SL-USB

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

From only £99.95
Call to discuss your rig-to-cable requirements.

WiNRADiO WR-G31DDC EXCALIBUR

A high-performance, low-cost, direct-sampling, software-defined, shortwave receiver with a frequency range from 9kHz to 50MHz.

Perseus VLF-LF-HF Receiver

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

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

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

PERSEUS = Pretty Excellent Receiver for Software-Eager Unperceivable Signals
It features a 14 bit 80 MS/s analog-to-digital converter, a high-performance FPGA-based digital down-converter and a high-speed 480 Mbit/s USB2.0 PC interface.

MFJ Products

MFJ-16010	Random Wire ATU 160-10M	£69.95
MFJ-949E	Manual ATU metered, Dummy Load, 1.8-30MHz, 300W	£179.95
MFJ-901B	Manual Mini ATU 1.8-30MHz, 200W	£109.95
MFJ-971	Manual ATU metered, 1.8-30MHz, 200W	£118.95
MFJ-904H	Manual ATU, metered, inc balanced, 1.8-30MHz 150W	£149.95
MFJ-969	Manual Roller ATU Metered 1.8-54MHz, 300W	£209.95
MFJ-993B	Auto ATU Metered 1.8-30MHz, 300W	£249.95
MFJ-1786X	Magnetic Loop 10-30MHz, 150W	£429.95
MFJ-1788X	Magnetic Loop 7-22MHz, 150W	£469.95
MFJ-259B	Antenna Analyser 1.8-170MHz	£259.95
MFJ-269B	Antenna Analyser 1.8-450MHz	£349.95
MFJ-260C	Dummy Load 300W SO-239	£44.95

Lots more MFJ stocked! See web for details

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

4m Wouxun antenna modification

The performance of the Wouxun KG-699E's rubber duck antenna can be significantly enhanced on 4m with this fairly straightforward alteration

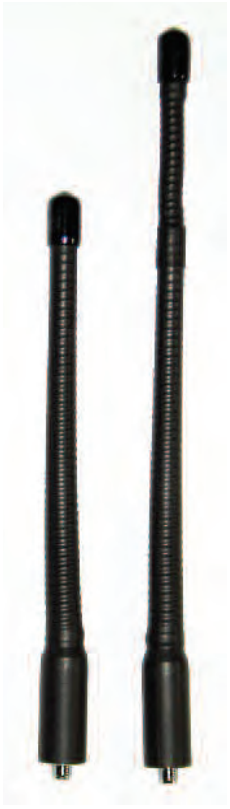


PHOTO 1: The original Wouxun KG-699E antenna (left) and a modified one (right) that works rather better in the 4m band.

INTRODUCTION. As with most VHF and below handheld antennas, the rubber duck [1] supplied with the Wouxun KG-699E handheld consists of a tough spring with a resilient plastic cover. The original antenna is on the left of **Photo 1**, where the spring structure can clearly be seen. I wasn't convinced that the antenna was operating particularly well on the 4m band, 70.0-70.5MHz. It is marked 66-88MHz, which is quite a broad range to ask of any single element antenna.

ON TEST. Optimising handheld antennas is a notoriously difficult art, because the operating conditions are so variable. Moving a radio from the side of your head to out in front has a marked effect on the antenna's operating environment. It also makes it hard to quantify antenna parameters. However, a physically small, battery powered piece of test equipment such as the MFJ-269 does approximate to a handheld. Using one to test the supplied antenna, I found that it resonated at around 76MHz – rather higher than the 4m band.

MODIFICATION. In order to lower the resonant frequency of the antenna, it is necessary to lengthen the spring radiating element. For various reasons it's a good idea to keep to about the same spring pitch, wire and coil diameter as the original, so I tried some 22SWG wire wound round a suitable former. Results were very encouraging; the instructions presented below can result in a signal strength improvement of 6dB or more in the 4m band. That 6dB improvement is like increasing the output power to 20W *and* quadrupling the receiver sensitivity – not bad for an investment of a few pennies!

INSTRUCTIONS. Carefully remove the end cap from the antenna. I found that the easiest way of achieving this was to use a small screwdriver to break the seal and prise the cap off. Once this is achieved, cut away a small amount of the plastic covering so that you expose the last couple of turns of the helix. The result should be similar to that shown in **Photo 2**.

Find a small screwdriver or other round object (nail, plastic tube, drill bit or whatever's handy) that will just slide into the end of the helical spring. You will need this later as a former on which to wind the extension. It doesn't have to be exactly the same size as the spring but should be reasonably close.

Tin the last turn of the helix, but be careful not to overheat the plastic while you work: holding the spring with a pair of pliers a turn or two from the end should help stop this happening because the pliers will act as a heatsink.

Solder a length of 22SWG enamelled copper wire to the end of the helix, continuing in the direction of the spiral. As a guide, 40cm of wire should be ample.

Slide the former inside the end of the helix and use it as a guide to close-wind 20 turns of the enamelled copper wire. I found a small jeweller's screwdriver was ideal, as shown in **Photo 3**. Cut off the excess wire.

Remove the former and stretch the coil to a length of 55mm (**Photo 4**). If you have suitable test equipment such as a MFJ-269 available, you can adjust the length for best performance – but I have modified quite a few now and 55mm consistently seems about right.

Apply a layer of heatshrink sleeving so that it that just covers the new wire. Once it has cooled, apply a second, longer layer that extends about 15mm over the original antenna covering. When the heatshrink fully cools, the extension becomes quite firm. Refit the original end cap, using a little glue to keep it in place. The completed antenna is shown on the right of Photo 1, alongside an original. I think it looks quite neat and it certainly does improve the performance!

REFERENCE

[1] Also known as a normal-mode helical, which is described in detail in the RSGB *VHF-UHF Handbook*.

PHOTO 2: End cap removed from the antenna and a short section of the helical exposed.

PHOTO 3: Additional wire soldered to end of helical and wound round a former.

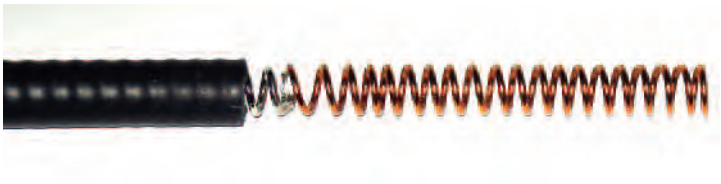


PHOTO 4: Spring smoothly elongated to 55mm.

HF

Plenty of DXpeditions in early 2011 to enjoy

Erecting antennas at VP8ORK.

DXPEDITION NEWS. Unfortunately the DX0DX Spratly DXpedition was not just delayed (see last month) but cancelled following the unavailability of the ship and other issues, but only after members of the team had met up in the Philippines. This is a great shame and must have been extremely frustrating for the would-be DXpeditioners who had invested considerable time and money in their participation. I believe some background will be given by the various GM team members at the GMDX Convention in April. As the permissions don't expire for some time yet, there is a slight possibility that this one will be rescheduled for later in the year.

In contrast, VP8ORK came off as planned and, at the time of writing, has been worked in the UK on multiple bands. Remember, though, that new ones don't always come by way of a DXpedition. VK0KEV is an Australian working on Macquarie Island and has been appearing on 20m, mainly working back to Australia, but occasionally taking calls from elsewhere. Several UK stations have made it into his log. While chasing DXpeditions is fun, it can require much more stealth and guile to catch up with one like this, where it is a lone individual doing some operating around his work schedule. ZS8M falls into the same category but kindly arranged a number of UK schedules and maintained them faithfully, allowing quite a few UK stations to catch this rare one. As I write this, though, he is off the air as he is busy sorting some serious maintenance issues with equipment on the island. The supply ship arrives on 15 March, so operations will probably cease completely around that time.

DX NEWS. Four Dutch amateurs plan a DXpedition to Sierra Leone, coordinated with the DAGOE Foundation and Mercy Ships. Callsign will be 9L5MS. This will be for three weeks in March, including the Russian DX Contest. They will be in the area of Freetown, with three goals: to operate from Sierra Leone on HF, provide support for a Mercy Ships charity project and raise funds for the Mercy Ships project. Donations and surpluses will go to that purpose.

Early results from Southern Sudan's independence referendum indicate an overwhelming vote to split from the northern half of the country. It will be interesting to see when Southern Sudan returns to the DXCC lists, having previously been accepted as a separate entity, but later deleted.

Nick, G3RWF, will be returning to Uganda from 20 February until 14 April. This is not a DXpedition as he will be doing voluntary work at a university, but will include plenty of operating as 5X1NH on 80 through 10m. He does not have room for a 160 metre antenna.

Bruno, DH1BL, is now living on Mayotte and will be there for the next three years. He has been operating as FH/DH1BL but now has the call FH4VOS.

Frosty, K5LBU, and Wayne, W5KDJ, are heading to Lesotho as 7P8CF and 7P8KDJ from 11 to 20 March. Plans are to have two stations for activity on 160 through 10m on CW, SSB, RTTY and PSK.

Several operators plan to be on from Guantanamo from 22 February to 8 March, callsigns KG4WV, KG4SS, KG4KL and KG4AS. They will be on 160 to 10m, including 60m, all modes.

Eddie, VK4AN, Kenneth, OZ1IKY, and possibly others will be operating as 3D2A from Fiji between 15 March and 2 April. This will also include the BARTG RTTY and CQ WPX SSB contests. Focus will be on 80, 40 and 30m and to some degree 160m. Both operators enjoy CW and the digital modes.

SP5EAQ and SP5DRH will operate from West Kiribati from 1 to 17 March. Calls will be T30AQ and T30RH. They'll be on 160 to 10 CW, SSB and RTTY, with a focus on the low bands and 30m.

A third attempt for a DXpedition to Sable Island (CY0) has been approved for early March. The team remains optimistic and determined. They will make their personal schedules as flexible as possible to deal with potential weather delays. Keep an eye on the website for the latest updates.

A group of YLs are planning a DXpedition to Curacao (PJ2). Plans are to have three or four stations and to be on as many bands as possible. This one looks as though it will be from 17 to 21 March.

Finally, the Utah DX Association has a free DXers' handbook, 44 pages long, available for download from their website. This is aimed at those new to DXing and is good value for money (ie it's free!).

60m REPORT (from G4TRA). It's been a very good month for long distance activity on 5MHz, but firstly some regulatory news. "The national association of Icelandic Radio Amateurs is pleased to announce that as of 13 December 2010 continued access for Icelandic licensees has been secured on 5.260-5.410MHz for a further two years. Access is granted on secondary basis for USB and CW with a maximum power of 100 watts". Our friends in Czechoslovakia would like to remind us that they are active on 5.2855MHz CW only, but that cross channel and mode QSOs are OK. Just six licensees have access so far but are easy to work from the UK says Petr, OK1RP. Portugal is back on 5.4035 and 5.3705MHz with CT1EEB, CT1IUA and CT1END active until the end of April. News further from home:

Building the shelters at VP8ORK.

The finished product - home to VP8ORK.

CE1/K7CA has put Chile on the air and can be best contacted from 0000 Friday and Saturday night. He uses his 160m top loaded vertical, but does not plan to be too active. V47JA will be operating from Calypso Bay, St. Kitts until 30 March. His XYL Cathy, W5HAM will also operate occasionally with her newly issued V47HAM callsign. QSLs to his home call, W5JON. V4/W1USN reports that he'll be on too. Finally, heard on 5MHz have been HK1X, ZF1EJ and YO3AGW for a new European one. Hopefully Ernie, ZB2FK from Gibraltar will soon be on, which one would have thought is an easy one from the UK, but he only runs 10 watts to a short vertical on 5MHz and finds receive signals quite weak.

2011 DX PREFIX AND 10 BAND CHECKLISTS. Pete, G-13038, from Pete's DX Newsdesk, reports: "As you know the DXCC country total has recently increased from 338 to 340 countries. So, I have updated the various prefix and 10 band checklists on my DX Newsdesk web page. If you go to the web page you will see a button to click to access the lists. They are in Doc, Excel and PDF formats. Help yourself and feel free to pass them on to your friends".

CORRESPONDENCE AND TABLES. First, an extensive end-of-year report from Bob, MD0CCE who has been doing a great job handing out this semi-rare one as well as adding to his own totals. He ended the year with 24,699 contacts and 265 countries. He feels that conditions were up slightly on previous years, with 10m openings to the US (not the West Coast) and VK at times, but 160m conditions were disappointing. That said, some of the DXpeditions have appeared to 'make their own propagation' as Bob puts it, largely by having good vertical antenna systems near the water. Bob notes some nice DX towards the end of the year including S21YX on 5 bands (heard but not worked on 160, too) and a nice one by way of VK0KEV on Macquarie Island. Bob says, "Rather than a monthly report, perhaps I can offer some comments on the year. My activity has been driven by my participation in G3WGVs UK CW Table, so I have been focused on new band slots for 2010. At first it was just catch as catch can, but late in the year I built a spreadsheet showing band slots needed and searched the bands for 'new ones'. It was surprising to me how such a structured approach can produce 25-30 or even more band slots a week, even at the end of the year with more than 1,500 band slots already worked in the year. Of course contests and expeditions are a big help when they come along, too! The new PJ entities certainly created a lot of interest and the DXpeditions to all of the new entities were very good and comprehensive in their coverage of the bands. The 5V7TT expedition was brilliant in their ability to virtually instantly post QSOs to the online log. The 9Q50ON expedition was very good in providing coverage on many bands and the VK9NN expedition was very consistent. I think we were spoiled for expeditions this past year and the new ones coming up in early 2011 promise to continue to restock our Horn of Plenty."

Nigel, G0BNR started 2010 with 308 DXCC entities, increased to 318 by year-end, albeit with some help from the splitting of the PJ entities. ZL8X was a tough one, but worked in the end on 20, 30 40 & 80m, after taking drastic measures and booking two days of leave! But he considers the 'jewels' of 2010 were ZS8M and LU1ZA (South Orkney which, ironically, most will now have after the VP8ORK effort). Despite the indifferent propagation for much of the time, Nigel managed 232 DXCC entities in total during 2010, his best yet. Nigel says, "I appreciate the hard work and effort that committed members of our hobby give to activate some of these entities. It saddens me to see much of the criticism that people give these guys on the Cluster. People on work assignment or holiday style ops often get criticised about their operating practices or technique, which is unfair given the efforts they may have gone to just to get on air."

Peter, G3HQT has been focusing on 30m and managed 159 entities since March, with recent new ones on there including (all CW): XV4SP, ZL8X, HK0GU, PJ5/SP6EQZ, ST2AR, J6/K8EAB and J5V. The New Year has also started with a bang, producing LU8EKC and TJ3AY on 30 PSK, OD5NJ, J28AA, A45XR, VQ9JC, 6W7SK, OR4TN, 9M2MRS, A92IO and 5N7M on 30 CW, VQ9LA on 30 RTTY and P43JB on 17 CW.

Dave, G3TBK has, as ever, been very active and mentions some nice DX worked late in the year, including E21YDB, Z21DXI and VP5CW on 10 CW, XW1B, D2SG and VP5/W5CW on 12 CW, with TJ3AY on 12 SSB and 5X1NH plus some VKs on both modes on 12m. 9Q50ON was worked on 8 bands (not 10m), while Dave managed to catch VK9NN on 40, 30, 20 & 17 CW, plus S21YX on 40, 30 and 15 CW. A35KL and FO8RZ were worked on 30 CW, along with J8/NA3J, a new band-slot for Dave – amusingly as Dave himself has handed out many 30m contacts from J8 over the years. P43JB, 4S7NE, XU7ACY, KH2L, 5H3ACR were nice catches on 80 CW while VQ9LA was a regular on 80 and 160m. Finally, ZL8X filled 8 band/mode slots between 80 and 20m.

Eddi, DK3UZ responds to my piece about SWL cards but commenting that, in his experience, many G stations don't even answer QSL requests from other amateur stations, never mind SWLs. Eddi still sticks to the old adage that 'the final courtesy of a QSO is a QSL' though I feel sure many would demur these days. A rule of thumb for many is to send or answer a QSL for the first contact on a particular band and/or mode, but others might question why even this is necessary, especially given the cost of cards and postage (many of the stations singled out by Eddi for criticism are active contesters, making many thousands of contacts a year – with facilities such as LoTW, eQSL and ClubLog, it might be asked whether a 20 second contest QSO justifies several pence for a QSL card?).

John, VK4OQ (G3HCT) mentions a book

VP8ORK up and running.

he has come across, *Atlas of Remote Islands,* ISBN 978-1-846-14348–9, which has information and maps relating to about 50 different islands, all of which would be considered 'rare' by DXers. Quite a few members of John's family have been affected by the recent floods in VK4-land and I'm sure our sympathies go out to them.

Simon, M0VKY sends in his year-end totals and mentions recent contacts with TJ3AY on 20, 17 and 15m, ZL8X on 20 and 40m, plus 9Q50ON on 20, 17 and 15m. Additionally, HV0A and Z24EA on 17, FM4NB, WP4JSP, 5X1NH and T6AE on 15 and FR1GZ on 10m. All SSB. He and some friends are planning a June trip to Skye for six days of HF operation.

Peter, G4XEX enjoyed the year's DX and notes that 2011 started with some active sunspots. Let's hope this is finally the start of a trend. Most of his recent DX (on 20m I presume) has been working the US and South America. Peter notes that his G5RV doesn't want to play on the WARC bands and he wants to address this in 2011. As I often comment to people, the G5RV antenna was designed for the harmonic bands 80, 40, 20 and 10m (yes, even before we had 15m) and, even so, presents a complex (ie not purely resistive) match on those bands; close enough to 50Ω to get away with minimal cable losses but still a long way from a 1:1 SWR. But in the days of valve transmitters with Pi output circuits, this wasn't an issue. Modern solid-state rigs are much less forgiving and to try and extend the use of a G5RV to the WARC bands is a challenge of hope over experience. A straightforward doublet is likely to work much better, with twin feeder from the antenna to an ATU and you can then run coax from there to the radio.

Graeme, G6CSY used low power (usually taken to mean 100 watts or less) or QRP (5 watts or less) to work YM2W on 10 CW, CR2X (Azores) on 15 CW, EK3GM on 20 PSK63, EA9IB on 40 RTTY and TF4M on 160 CW.

TABLES AND REFLECTIONS. The final 2010 table appears this month. To my mind, everyone is a 'winner' as the table demonstrates not only what the active and best-equipped DXers have achieved, but what the more modest stations (and those with less time available) can manage, too. Some correspondents have already started to send in scores for 2011 which, to remind you, will change to a WARC bands table, but don't worry if you don't operate on CW – it is by no means essential to have a 30m score, though you might want to use this as an incentive to try the datamodes, or even to make an effort to learn or relearn the code!

I recently had another e-mail asking about the RSGB's position on 5MHz, given that the 5MHz Experiment is primarily about experiencing NVIS (Near Vertical Incidence) propagation, which is essentially short-skip, while G4TRA's reports in this column cover happenings around the world. Personally, I don't see a conflict insofar as the majority of 5MHz activity in the UK is indeed close-in and that allocation demonstrates time and again why the military have stuck to it over the years for reliable short-range communication. It lends itself well, for example, to SOTA (Summits on the Air) contacts, where big signals are the norm, even with battery power and low antennas.

Equally, of course, each of our other bands have their primary uses. Why chase ZL8X on 80m when an understanding of propagation tells you that 40, 30 or 20m are far more suited? Equally, why try and work Wales from England on 12m, when 160 or 80m lend themselves far better to that purpose? But we radio amateurs tend to get our pleasure from looking for the unusual and attempting to communicate (or at least hear things) under the most marginal of conditions. It's perhaps as well that we do, as otherwise we might feel the internet would serve us just as effectively!

So this column will continue to focus on DX activity (albeit with a pretty loose brief), fully recognising that there is lots of other activity happening daily on our HF bands. What I am always anxious to do, though, is to emphasise that DXing is by no means an activity restricted to those with room for 60ft towers, or fully retired with time on their hands. The good news is that, in these days of compact radios and low-cost airfares (for how much longer?), there is always 'DX' to be worked and usually without too much competition. It tends only to be the major expeditions to the rarest entities that attract the very big pile-ups and patience really does become a virtue. But, it has always seemed to me, it is the chase that encourages us to continually strive for improvement, whether in our stations or our operating skills. So here's to a successful year of DX in 2011.

As for deadlines for sending in news, rather than mention them each time, perhaps I can just say that my own deadline for submission is close to the month-end, so I really need material about a week before to be on the safe side.

2010 ANNUAL TABLE

(starting 1/1/10, final table, sorted by grand totals)

Call	10m	12m	80m	160m
MD0CCE	138	169	169	138
G3TBK	111	139	152	121
G0BNR	107	76	84	71
MU0FAL	62	92	83	51
GW4BLE	94	36	62	63
G3SED	35	92	50	73
G3HQT	55	53	81	0
M0VKY	61	12	44	38
GW1PJP	60	52	8	0
G4ATA	0	0	106	0
G6CSY	22	9	52	22
G3VMY	30	23	48	0
G4XEX	25	27	31	1
GW0RYT	40	29	6	0
G1UGH	40	27	0	0
MM0DXH (SSB)	19	0	27	14
G4FVK	18	1	34	3
MW0MAU	7	12	6	0

WEBSEARCH

7P8: www.tdxs.net/lesotho2011.html
9L5MS: www.sierraleone2011.com
Pete's DX Newsdesk: www.dx-newsdesk.co.uk
PJ2 YL trip: http://yldxpeditions.com/
Sable Island: www.CY0dxpedition.com
T30 expedition by SPs: www.sp5drh.com/t30
Utah DX Association: www.udxa.org

VHF/UHF

Listen out for 50MHz Trans-Equatorial Propagation during March

PHOTO 1: Assembling the 50MHz station at T70A.

PROPAGATION REPORTS. Very little DX activity was reported on the VHF and UHF bands during January. This is not really surprising as the weather was particularly inclement and therefore the tropospheric conditions were generally poor. If there hadn't been meteor trails, aeroplanes or the Moon to 'bounce' signals off then there would have been virtually nothing to report.

Just for the record though there was a very small amount of ionospheric propagation during January. It affected the 50MHz band with a Sporadic-E (Es) opening being reported on 3 January between 2030-2115UTC to Spain (EA3AKY, EA5BY, EA5EF) and the Balearic Islands (EA6SA). Another Es event was reported between 1650-1735UTC on 5 January but only the Portuguese beacon stations of CS5BALG (not a spelling mistake!), CS5BCP and CS5BLA were heard.

Jim Rabbitts, GM8LFB (Caithness, IO88) reported an auroral (Au) back-scatter opening and an auroral-Es (Au-Es) forward-scatter opening during the night of 6-7 January. At 2200UTC he heard the 6m OY6BEC beacon (Faroe Islands) fully auroral and at 0100UTC the JX7SIX beacon (Jan Mayen Island) with pure T9 signals.

An auroral opening was also reported on 12 January by the 70MHz station of Brian Sparks, GM4JYB (Caithness, IO88). At 1900UTC he heard the Faroe 4m beacon OY6BEC with 52A signals. The 'A' incidentally indicating an auroral sounding signal. Later in the evening, at 2200UTC, the station of GM8LFB heard the Finnish 6m beacon OH9SIX via Au-Es with 559 signals.

At this point I should explain what is meant by back-scatter or forward-scatter in the context of Au and Au-Es propagation. Back-scatter is the reflection of waves or signals back to the direction they came from. To make contact via aurora you have to beam at the aurora itself and its position in the sky will determine the favoured regions for strong signals. Signals are back-scattered from the ionisation, which forms a sloping wall because the Earth's magnetic field is dipping sharply towards the vertical at high magnetic latitudes. The plasma, at E-layer height, from which the radio waves are back-scattered are highly agitated due to the flux of the incoming electrons. The motion of these electrons modulates the scattered signals, producing a characteristic 'hiss' caused by random Doppler shift. On SSB the signals sound very rough and it can often be difficult to understand what is being spoken. The use of CW is far more efficient as the signals sound just like keyed white noise and with little practice can easily be understood – providing, of course, that you can read Morse code.

Auroral-E is similar to the more familiar temperate-zone Es although it is generally found at higher northerly latitudes. Signals are forward-scattered via the intense ionisation, assumed to be at the mid-point (but not necessarily so) of the propagation path, to the distant station. Au-Es is occasionally observed on the 50MHz and 70MHz bands, at night as well as during the day and at other times besides the summer period. This is because the ionisation originates from incoming auroral particles rather than solar ultraviolet radiation. Hence the time and place of Au-Es tends to follow that of the aurora. Usually Au-Es is formed from the ionisation remaining after an auroral storm and its associated geomagnetic disturbance have subsided. It can however precede an aurora if sufficient ionisation is already present from particle precipitation. The mechanism that concentrates the ions into a layer sufficiently dense to reflect VHF signals is probably wind-shear, the same process that exists for conventional summer Sp-E openings. Unlike signals propagated via the auroral curtain that sound very distorted, Au-Es signals have a pure pitch. In this respect they are similar to Es propagation except that paths are normally restricted to higher latitudes. Scottish stations will experience this propagation quite frequently whereas operators located in the south of the UK will usually only hear the stronger events.

METEOR SHOWERS. The only propagation mode that is reasonably predictable is meteor scatter. The New Year began with the intense but brief Quadrantid shower with maximum activity around 3-4 January. Some of the 50MHz stations reported to have been worked from the UK included EA1QT, EA6CA, F1TMY, HA3UU, HB9QQ, IW2MYH, IT9TYR, LA4WKA, OE4VIE, OK1DX, OZ9KY, S58J, SC7C and YL2CA. Later in the month, on 27 January, the rare station of T70A in San Marino (**Photo 1**) was active for a few hours and made a few JT6M contacts with UK stations. Regrettably there was very little activity on the 70MHz band with only the stations of DI2BK, DL6BF, OK1DFC, OZ1DJJ and OZ1JXY being worked on JT6M and FSK441 data modes.

There was considerably more activity on the 144MHz band with UK operators reporting FSK441 contacts with 9A3XM, CT7ABA, DJ9EV, EU6AF, HA6NY, I8KPV, LA/OH2FPN, OH6UW, OK5KE, S58M, SP2HPD, YO6MN and YU2DX. One of the furthest distance contacts made on the 144MHz band during the Quadrantids was possibly between the stations of G8VHI (IO82) and OH9HEU (KP25) over a 2077km path.

The month of January overall has good meteor rates but this diminishes significantly during February and March. This is a particularly poor time for MS propagation as there are no major showers throughout the period and the daily sporadic meteor count is at a yearly minimum. However in the following months two major showers appear. The first are the Lyrids with a maximum around 21-22 April that raises meteor rates for several days. The Eta Aquarids on 5-6 May also enhance the meteor rate, sometimes quite substantially. The period between June to mid-July has fair meteor rates. The last half of July has rates increasing steadily as the Delta Aquarids on 27-28 July and Alpha Capricornids on 30 July–1 August have maxima at the end of the month. Overall, late July to mid-August is very rich in meteors. Even the Perseids are beginning to show a little activity. The Perseids maximum, around 12-13 August is fairly prolonged and often quite intense. High sporadic activity continues for the rest of the year but especially in September and the first half of December. Mid-October to mid-December is a near continuous period of heavy meteor activity. The Orionids on 21-22 October have a prolonged plateau maximum for several days. The Taurids, 11-12 November, active for two months, are most numerous in November's first half but can be rather variable in strength. The Leonids of 17-19 November are quite unpredictable, with rich displays

occurring approximately every 33 years. The last Leonid storm period occurred from 1998 through to 2002 so there's some considerable time to wait before the next big one. The Geminids shower on 13-14 December climaxes the year with many rich meteors. Finally, the overlooked Ursids complete the year's activity, reaching a maximum around 21-22 December. That's the great attraction about meteor scatter. You can plan the year ahead in the knowledge that there will be distant VHF stations to contact on the days that suit you.

50MHz TRANS-EQUATORIAL PROPAGATION. Since the release of the 50MHz band to UK radio amateurs over 25 years ago, the exploration of trans-equatorial propagation (TEP) has become particularly interesting. The identification and exploration of this propagation mode has been carried out largely by amateurs using scientific methods. By measuring the time delay along the path it was demonstrated that TEP involves reflection from the ionospheric F-layer. It was found that the maximum F-layer ionisation occurs in two belts located north and south of the geomagnetic equator, not to be confused with the geographical equator. These belts of ionisation form in the morning, are well developed by noon and decay after sunset to reach a minimum just before dawn. The positions of the ionisation belts are independent of the time of year but they become unbalanced in intensity as the Sun 'charges-up' either one or the other. This propagation mode makes use of both belts or regions of ionisation and these are at their best when the intensities of the two regions are greatest. The time of year when both of these are equally illuminated by the Sun is around the equinox period. The vernal (spring) equinox occurs on 20 March and the autumnal equinox is on 23 September. So the best months to spot TEP on the 50MHz band is generally in the period March-April and September-October. However it's not that simple! It is during the maximum of the solar cycle when the highest ultraviolet output occurs and this leads directly to more intense ionospheric ionisation of the equatorial zones. Therefore TEP is normally prevalent around the time of sunspot maximum but, as you may know, we've been in a very long and very low solar minimum period. The good news however is that the Sun is starting to perk up with a number of sunspots being observed since March 2010. The current prediction is that the next maximum will occur during the summer of 2013. Incidentally, the 50MHz band will also be open at the same time via F2-propagation to other parts of the world, as can be seen in the QSL cards (**Photo 2**).

So the best years for TEP observations will be 2012-2014 (assuming the maximum is in 2013), the peak months will be March-April and September-October and the best times, from midday for a few hours and the early evening for a few hours.

But there is another factor that can influence whether or not you can participate in this exciting propagation mode. The most consistent and longest paths are those that are symmetrical about the geomagnetic equator, generally between the Mediterranean area and southern Africa over paths in excess of 6000 kilometres. Similar paths exist around the World most notably between Australia (VK) and Japan (JA) and countries in South America to the Caribbean area.

For the next year it is unlikely that the TEP zones can be accessed directly from the UK without the aid of another propagation mode. Sporadic-E seems to be the only contender since tropo ducting will never extend sufficiently far. However the incidence of Es during March and September is far less prevalent than is often observed during the summer period. Nevertheless, TEP openings will often be made between the UK and southern Africa by stations located on the south coast of England. For many operators located in central England and Wales this is most annoying! As the Sun becomes more active the openings will spread northwards throughout the UK but stations in the south will always experience the best of the events.

I've kept records of 50MHz TEP openings made from my Herefordshire QTH (IO81) since 1985. The first series of openings I participated in were in a three and a half-year period between October 1988 and April 1992. This was followed by a 7 year gap between 1993 and 1999 with no TEP signals being heard at all. The next series of openings only lasted two and a half years between March 2000 and October 2002. This was followed by an 8 year gap (so far) between 2003 and 2010. From my QTH I think that recommencement of TEP contacts will be in either March or October 2011. My records show that over two sunspot maximum periods the majority of TEP openings to southern Africa were made in the March period rather than in October. Signals were much stronger and the openings were more numerous during the spring equinox period. During the years of sunspot maximum this period actually extended from February through to May.

In March 2010 there were 20 days when TEP activity was reported between Europe and the southern extremities of Africa on the 50MHz band. Interestingly the propagation got stronger as the month progressed with the period between 21-27 March being particularly good. Openings every day during this period (except for one on 27 March 2010) were made between stations located in the ideal areas either side of the geomagnetic equator. In southern Europe these included stations in the Balearic Islands (EA6), Cyprus (5B), Italy (I), Malta (9H), Portugal (CT), Sardinia (IS), Sicily (IT),

PHOTO 2: Worked All Continents on the 50MHz Band.

Slovenia (S5) and Spain (EA). On the opposite side of the geomagnetic equator were the CW and SSB stations of TN5SN (Congo), TR0A (Gabon), ZS6BTE, ZS6NK, ZS6TAF, ZS6WAB (South Africa), Z22JE (Zimbabwe) 5N7M (Nigeria) and 6W1SJ (Senegal). In addition to these fixed stations were also the propagation beacon stations of S9SIX (Sao Tome and Principe), ZD8VHF (Ascension Island), ZS6JON, ZS6TWB (South Africa), Z21SIX (Zimbabwe) and 9Q1D (Republic of Congo).

The most recent opening between England and South Africa (ZS) was reported between 1310-1320UTC on 27 March 2010. Ken Osborne, G4IGO (Somerset, IO80) exchanged JT65 data-mode signals with Willem Badenhorst, ZS6WAB but reception was very weak, not even good enough for a CW contact. Ken reports that no African television or southern European beacons were heard at the time. With the close-down of the last Spanish Band I television transmitter in March 2010 there are very few, if any, indicators to show that the 50MHz band is possibly open into southern Africa. An hour later, at 1405UTC, the station of Peter Scutt, G3IBI (Hampshire, IO90) heard the beacon of ZS6JON peaking 319 over the 9000km path but no other African signals were noted at that time.

During March of this year it is expected that TEP contacts will become more extensive. So monitor the 50MHz band as often as you can and pay particular attention to the DX Cluster 'spots' of contacts being made between southern Europe and Africa. Keep a look out for auroral activity as this indicates an increase in solar activity. Often within a day or two the TEP path becomes more enhanced. You never know, it might even occur during the 50MHz UKAC (activity contest) being held on 22 March.

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 before the end of each month. Alternatively you can send letters to Yew Tree Cottage, Lower Maescoed, Herefordshire, HR2 0HP.

nevada radio®

Ecoflex®

New Ecoflex Low Loss Cables & Connectors at Nevada!

New range of cables & connectors at Nevada! Flexible with PE-LLC dielectric and gas content of over 70% for very low loss and use up to 6 GHz

Ecoflex 15

Specification
- Diameter: 14.6mm
- Loss per 100m: 2.81dB @ 100MHz, 1.96 dB @ 50MHz

Price: £5.60 per metre, **£504** per 100m drum

Ecoflex 15 Connectors
- **PL259** connector (Part: 7350) **£8.95**
- **N type** connector (Part: 7395) **£9.95**

Ecoflex 10

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

Price: £2.65 per mtr, **£238** per 100m drum

Ecoflex 10 Connectors
- **PL259** connector (part: 7378) **£5.95**
- **N type** connector (part: 7367) **£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

Aircell

Aircell range is a highly flexible coaxial cable for use up to 6 GHz. The low losses in relation to the diameter and the small bend radius of the cable make it perfect for the Radio Amateur.

Aircell 5

Specification
- Diameter: 5.0mm
- Loss per 100m: 9.4dB @ 100MHz, 6.61dB @ 50MHz

Price: £1.35 per mtr, **£121.50** per 100m drum

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

Aircell 7

Specification
- Diameter: 7.3mm
- Loss per 100m: 6.28dB @ 100MHz, 4.52dB @ 50MHz

Price: £1.70 per mtr, **£153** per 100m drum

Aircell 7 Connectors
- **PL259** connector (part: 7390) **£2.65**
- **N type** connector (part: 7392) **£5.25**
- **BNC type** connector (part: 7371) ...**£5.25**

Aircom Plus

Operating up to 10 GHz, this semi Air spaced cable has a massive oxygen free copper inner conductor covered with a thin film of PE to prevent corrosion permanently

Aircom Plus

Specification
- Diameter: 10.3mm
- Loss per 100m: 3.8dB @ 100MHz, 2.6 dB @ 50MHz

Price: £2.95 per mtr, **£265.50** per 100m drum

Aircom Plus Connectors
- **PL259** connector (part: 7378) **£5.95**
- **N type** connector (part: 7367) **£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

BEST DEALS ON ICOM YAESU KENWOOD

no free Bits 'n' Pieces just the **LOWEST PRICES - GUARANTEED!** ...Daily Web specials too !

KENWOOD TS-590S

IN STOCK!

£1489.95 See Nevada Web for **BEST PRICE**

TS-480SAT	HF/6m 100W inc ATU	£779.95
TS-480HX	HF/6m 200W – no ATU	£879.95
TS-2000E	100W HF/6/2m with ATU	£1439.95

Kenwood Accessories

SP-23	Extension Speaker	£68.95
HS-6	Lightweight Headphones	£35.95
HS-5	Deluxe Headphones	£52.95
MC-60A	Desk Microphone	£117.95
MC-43S	Hand Microphone	£19.95
MC-47	Hand Microphone	£39.95
SP-50B	Mobile Speaker	£27.95

Yaesu Rotators at DISCOUNTED PRICES! G-450C

G-2800DXC	Heavy Duty	~~£715.00~~ £859.95
G-1000DXC	Heavy Duty Variable Speed	~~£652.00~~ £449.95
G-1000	Heavy Duty	~~£571.00~~ £399.95
G-650	Medium Duty	~~£510.00~~ £379.95
G-450	Light Duty	~~£420.95~~ £319.99
Rotator Cable	25m inc fitted plugs	£69.99

We carry a full selection of Rotator Bearings - see web for listing

YAESU FT-DX5000MP

NEW

£5295.95 See Nevada Web for **BEST PRICE**

FT-DX5000	NEW Fully featured	~~£4239.95~~ See Web!
FTM-350R	NEW VHF/UHF Mobile	£529.95
FT-450ATU	HF + 6m + Auto Tuner	£699.95
FT-817D	Portable Transceiver	£499.95
FT-857D	HF/VHF/UHF Mobile	£649.95
FT-897D	HF/VHF/UHF transceiver	£759.95
FT-950	HF + 6m Base Transceiver	£1289.95
FT-1900	NEW 55 Watts 2m Mobile	£139.95
FT-2900	NEW 75 Watts 2m Mobile	£134.95
FT-7900	NEW VHF/UHF Mobile	£239.95
FT-8900	2m/70cms/6m/10m FM Mobile	£379.95
FT-60E	2m/70cms Handheld	£179.95
VX-8DE	NEW 2m/70cms/6m Handheld	£399.95
VR-160	Miniature Scanning Receiver	£219.95

YAESU YH-77STA

Stereo Lightweight communications headphones

£49.95

Sponsors to the T32C 5 Star Dxpedition to Kiritimati Christmas Island September 2011

We are providing, warehousing, cable and financial support to this top Dxpedition team, of which our Boss, Mike G3SED, is a founder member.

NEVADA - talk to the experts on HF radio!

COMET CMX-200 Power Meter

NEW

- 1.8-200MHz
- 3kW HF, 1kW VHF
- Average/PEP power
- Cross Meter display

INTRODUCTORY OFFER ~~£119~~ **£99.95**

COMET Antenna Tuners

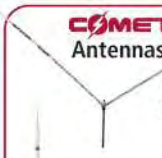
CAT-300 HF Antenna Tuner
- 1.8 - 60 MHz
- 300W (SSB)

£189.00

CAT-10 Mobile Antenna Tuner
- 3.5 to 50 MHz
- Power: 10W

£99.00

COMET Antennas



H422 HF Rotary Dipole
- 40/20/15/10M
- 10.4m (straight), 7.4m (V)
- 1kW PEP

£269.95

CHA-250B Wide Band Vertical
- 80 to 6 Metres No ATU needed!
- 250W PEP
- 7.2m high

£299.95

CWA 1000 HF Trapped Dipole
- 80, 40, 20, 15, 10m
- Power: 500W

£99.95

VHF/UHF Base Antennas		
GP1	144/430 MHz 3.0 / 6.0dbi 1.25m	59.95
GP3	144/430 MHz 4.5 / 7.2dbi 1.78m	69.95
GP6	144/430 MHz 6.5 / 9.0dbi 3.07m	99.95
GP15N	50/144/430 MHz 3/6.2/8.6dbi 2.42m	99.95
GP98	144/430/1200 MHz 2.94m long	139.00
Duplexers		
CF360A	28/50MHz SO239/PL259/PL259	39.95
CF416A	144/430MHz SO239/PL259/PL259	34.95
CF416B	144/430MHz SO239/PL259/N male	34.95
CF503C	50/144MHz SO239/SO239/SO239	44.95
CF530C	50/144MHz SO239/PL259/PL259	44.95
CF530A	50/430MHz PL259SO239/SO239	39.95
CF4160B	144/430MHz SO239/SO239/SO239	32.95
CF706	For Icom IC706	39.95
Triplexers		
CFX431A	144/430/1200 N/PL259/N/N	49.95
CFX514N	50/144/430 SO239/PL259/PL259/N	49.95
HF Mobile Whips PL259 Fitting		
HFB10	28MHz 0.95m 120W	39.95
HFB40	7MHz 1.6m 250W	39.95
HFB6	50MHz 0.95m 250W	39.95
HR50	50MHz 2.13m 200W	49.95
Cable Assemblies		
3K054M	4m cable SO239/PL259	24.95
Current Baluns		
TFA-400	(1.3-500MHz) 400W	69.95
TF-1800	(1.3-500MHz) 1.8kW	79.95
TF-5000	(1.3-500MHz) 5 kW	99.95
HF Baluns 1:1		
CBL-1000	50 ohm 1kW ...1.7 – 30 MHz	35.95
CBL-2500	50 ohm 2.5kW 1 – 56MHz	38.95
Low Pass Filters		
CF30H	Cut off 32 MHz 2kW	69.95
CF50MR	Cut off 57 MHz 1kW	49.95

ICOM IC-7000

IC-7700	HF + 6m Base Transceiver	~~£6110.95~~ CALL
IC-7600	Dual DSP HF +6m TX	~~£3980.64~~ CALL
IC-7200	Rugged! HF+6m Port/Base	~~£949.95~~ CALL
IC-7000	HF/VHF/UHF Mob/Port/Base	~~£1348.00~~ CALL
IC-910H	VHF/UHF 2m/70cms Base	~~£1702.95~~ CALL
IC-718	HF Base/Port Transceiver	~~£675.62~~ CALL
IC-E880	NEW VHF/UHF with D-Star	~~£499.95~~ CALL
IC-E80D	NEW Dualband H/H, built in D-Star	~~£369.00~~ CALL

TYT-UVF1

NEW

Dual Band Transceiver
- 145/433MHz
- 128 Memory Channels
- Supplied c/w re-chargeable battery pack, drop in charger and power supply, rubber duck antenna, belt clip, carry strap, DC charge cable for the car

£99.95

TYT-800

NEW

VHF 2 Metre 5W Handheld
- Frequency: 136-174 MHz
- 199 memory channels
- Steps: 5, 10, 12.5, 20, 25, 30, 50kHz
- 50 CTCSS codes
- VOX time-lapse function,
- Channel scan
- Voice prompt function
- Emergency alarm
- FM radio receiver function

£59.95

TYT-800 Accessories

Battery Eliminator	£11.99
Speaker Microphone	£15.99

Wouxun KG-669E

4 metre Handheld
- 66-88MHz '4m FM Band'
- CTCSS/DCS tones
- 128 memories
- 8 groups scrambler
- Channel name edit
- Power 5W or 1W
- VOX (Level adjustable)
- Wide/Narrow bandwith

£89.95

Daiwa Meters 801HP SWR Power Meter

Japanese high quality, huge twin needle display reading Average power, Peak power and SWR
- Freq: 1.8 - 200MHz
- Power: 20/200/2KW
- Connectors: SO239

£99.95

CN801VN	140-520MHz (N type Sockets)	£119.95
CN101L	1.8-150 MHz	£99.00
CN103LN	140-525MHz	£99.00
CN801S	900MHz-2.5GHz N types	£119.95
CN801V	140-520MHz (SO239)	£99.95

OPEN: Mon to Fri 9.00am - 5.30pm
Unit 1 Fitzherbert Spur Farlington
Portsmouth Hampshire PO6 1TT

023 9231 3090

warehouse

BEST
- Products
- Delivery
- Service

THOUSANDS of products online

LDG Tuners

Popular Models
NOW in STOCK!

AT600 Pro	600W Auto Antenna Tuner	£324.94
AT-100 Pro II	160 - 6m) 125W	£199.95
AT-200 Pro	(160 - 6m) 250W	£209.95
AT-897 Plus	for Yaesu FT897 Plus	£179.95
AT-1000 Pro	(160 - 6m) 1kW	£499.95
IT-100	for Icom IC-7000	£209.95
YT100	for Yaesu radios 125W	£199.95
Z-11 Pro2	(160 – 6m)125W	£159.95
Z-817	QRP for FT817 & others	£119.95
FTL	Meter for FT857, FT897	£79.95

MFJ Accessories

MFJ 269

MFJ 259B	HF/VHF Analyser	£279.95
MFJ 269	HF/VHF/UHF analyser	£349.95
MFJ 941E	300W Tuner	£139.95
MFJ 949E	300W HF tuner	£179.95
MFJ 16C06	4 pack Ceramic insulators	£4.95
MFJ 260C	300W Dummy load	£44.95
MFJ 550	Morse Key	£16.95
MFJ 901B	Portable ATU	£72.95
MFJ 945E	300W Tuner	£129.95
MFJ 948	300W Tuner w/balun	£159.95
MFJ 969	300W Tuner	£209.95
MFJ 971	200W Portable Tuner	£118.95
MFJ 993B	300W Tuner	£249.95

Antenna Switches

Comet CSW 201G

Two Way

Comet CSW201G	1kW 600MHz (SO239)	£19.95
Daiwa CS-201G II	1kW 600MHz (N type)	£29.95
Zetagi V2	500W HF (SO239)	£14.95

Three Way

Zetagi V3 – 2Kw HF	(SO-239)	£26.95

4 Metre FM Mobile - Model AT-5189

NEW

- 66 - 88MHz
- Power: 0 - 25W adjustable
- Memories: 250
- CTCSS/DCS/DTMF/2TONE

£149.95

Nevada Coaxial Cables

100m Drums

Westflex 103	Semi Air-spaced	£139.95
RG213U	Mil Spec low loss	£99.95
RG213TM	Economy low loss	£89.95
RG Mini 8 Super XXD	7.3mm Low Loss	£64.95
RG58C/U	Military Spec Best Quality	£39.95
TAF 450 Ohm Twin feeder		£69.95
TAF 300 Ohm Twin Feeder		£59.95

25 Metre Lengths

Westflex 103		£35.62
RG213U	mil spec	£28.50
RG58	mil spec	£10.69

ALINCO Affordable HF Radios

DX-R8
SDR Capable Communications Receiver

NEW

The **NEW R8** receiver has an IQ output, which allows you to monitor AM/FM/SSB/CW signals either in as a superheterodyne desktop receiver or using your PC with free SDR software (not supplied).

Listen to:
DRM Hi-fi broadcasts without a converter.
PC-decode of HFDL, FAX, NAVTEX, RTTY, PSK and more.

- Frequency: 0.15 - 29.999MHz (coverage to 35MHz with optional mod)
- Modes: AM / FM / CW / USB / LSB
- Selectivity: AM Narrow 2.4 kHz, AM/FM 6 kHz SSB/CW 2.4 kHz
- Audio output : 2.0 W into 8 Ohm
- Memories: 600 channels in 3 banks
- Power requirements: 11.7 - 15.8V DC
- Size: 240 x 100 x 293 mm
- Weight: 4.1 kg

£549.00

DX-SR8
HF Transceiver

NEW

An easy to use and affordable HF transceiver, covering all the HF bands including 5 MHz. It's fully featured too, with FM mode, a special low power setting designed for QRP operation, built in narrow filters for SSB and CW modes a detachable head unit (with optional kit) and built in CW keyer.

- Modes: SSB,CW,AM,FM
- Power: Up to 100W FM, SSB/CW, up to 40W AM
- Receiver Range 135kHz - 29.999 (30kHz - 34.999MHz with optional mod)
- Detachable front control panel
- IF shift, Narrow Filter, Noise Blanker
- Built in electronic keyer, QSK operation,
- Dual VFO
- 600 memories in 3 banks
- Power: 100W with QRP Mode (0.1 to 2.0) W
- Connection for Auto tuner
- CTCSS 10 Metre FM repeater access

£599.00

Alinco DJ-175
VHF 2 Metre Handheld

- TX: 144 - 148 MHz
- RX: 136 - 173.995 MHz
- New 2-touch repeater function
- 200 memory channels plus CALL channel
- CTCSS, DCS and DTMF
- 3 levels of output power
- Supplied c/w battery and charger

£79.95

Eton G3
Portable Shortwave Radio – with SSB

- AM/LW/FM-stereo
- Shortwave (150-30000 kHz)
- VHF Aircraft band (118-137 MHz)
- Wide/Narrow filters
- Synchronous Detector w/ selectable side-band
- Plus lots more!

£99.95

PRO Antennas
High quality British manufacture

Dual Beam Pro
Capacity Loaded Rotary Antenna

- Covers: 40, 30, 20,17, 15, 12, 11 & 10m
- Turning radius: 2.5m
- Main element span: 5m
- Power: 400W

£219.00

I-Pro Home
Capacity Loaded Vertical Antenna

- Covers: 40, 30, 20,17,15,12, 11 & 10m
- Height: 5m
- Weight: 4.5kg
- Power: 400W

£229.00

PALSTAR® Power Supplies

PS 8250
25 Amp Switch Mode Supply

- Twin meters for current and Voltage
- Lightweight
- Fully protected

£99.95

SPS-9600
60 Amp Switch Mode Supply

- Variable output voltage
- Fully protected

£199.95

PS-50
50 Amp (peak) Bench Supply

- Fully protected
- Voltage & Current metering

£199.95

PS-30M
30 Amp (peak) Linear Supply

- Variable Voltage
- Fully protected

£99.95

Other Palstar supplies

PS-04	4A 13.8V DC supply	£24.95
PS-06	6A 13.8V DC supply	£29.95
PS-15	15A 13.8V DC supply	£59.95
SPA-8230	23A 13.8V DC Switch Mode	£59.95

ALINCO

Alinco DJ-G7E
Brand new model!

- Transmit: 2m/70cms/23cms
- Receives: 0.5-1299.95MHz
- 1,000 Memory Channels
- Full duplex operation
- CTCSS, DCS encode/decode
- DTMF Auto-dialer
- Supplied c/w Li-ion 1200mAh battery and Drop-In charger

£299.00

DJ-V17
Waterproof Handheld

- TX/RX 144 - 145.995MHz (optional 137- 173.995MHz)
- 2 touch repeater access
- Submersible 1m/3feet for 30min) and rugged body
- 39 CTCSS tone squelch encode + decode settings
- 200 memories
- VFO, Memory, scan modes

£149.00

EDX-2
120W automatic long-wire antenna tuner

£289.95

DM-330MW-UK
30 Amp Switch Mode, high quality Supply

- Low noise
- Lightweight and portable
- Triple Protection circuit
- Low Ripple • Fully Filtered

£99.95

We carry the complete range of Alinco spare Batteries & Accessories - visit our web for full details.

EMS-14
Base Mic Fitted 8 pin plug for most models

£89.95

DR-635
Advanced Dual Band Mobile transceiver

- Remote head facility & multi-colour display
- Bands 144 / 430 MHz with wideband RX
- (VHF to VHF) or (UHF to UHF) capability
- 50 Watts output power
- 200 Memory Channels

£299.00

DR-135 Mk III
50W VHF Voice/Data Mobile transceiver

- 100 memory channels
- CTCSS/DCS encode + decode
- 5/10/50 Watt output

£179.00

www.nevadaradio.co.uk

GHz Bands

Dealing with strong out-of-band signals on 13cm

PHOTO 1: Frequency spectrum at the base of my 13cm band antenna feeder. The signals from left to right are GSM900, GSM1800 and 3G.

NEW PROJECT. Over the Christmas period I decided to build a new 13cm band (2300 – 2320MHz) transverter to replace my aging unit. Inspired by OK1DFC's switched local oscillator (LO) sub band design **[1] [2]** for 13cm I decided to use my spare Apollo 32 **[3]** local oscillator as it was laying in the projects drawer, unused, in need of a good project. The Apollo 32 uses a Silicon Labs Si4133 synthesiser chip to produce a carrier on one of 32 switch-selected frequencies in the 1000 – 1200MHz frequency range. Conveniently, the Apollo designer, Steve Hicks, N5AC **[4]**, had made provision for a number of frequencies that could be useful in a 13cm band transverter LO. As my main interest at 13cm is moonbounce (EME) I need to be able to cover 2301, 2304, 2320 and 2424MHz in order to tune signals in the various sub bands in use around the world. 13cm is possibly the most split allocation of all the bands in global amateur radio use.

Using an IF of 144MHz, I can switch the Apollo 32 to give 1078.5MHz (2301MHz), 1080MHz (2304MHz), 1088MHz (2320MHz) and 1140MHz (2424MHz). The Apollo output is followed by an active doubler (BFR92A), Neosid filter helical filter and MSA08 buffer amplifier to obtain typically +9dBm output at the required final LO frequency.

Using a high quality surplus Collins Radio filter in the transverter I found I could obtain a useful 1dB RF passband from 2300 to 2330MHz (2424MHz is covered in a separate, outboard down converter).

Thinking that this would give me good immunity against strong out of band signals, I was horrified, on test, to find that in certain beam directions the new transverter suffered from severe interference effects. With my spectrum analyser attached to the transverter 144MHz IF output I found a number of very strong, digitally modulated carriers were present. They were almost certainly the cause of my problems.

Looking directly at the feeder output of the 13cm band Yagi antenna, the biggest interfering signals peaked when beaming towards a local (0.5km away) mobile phone mast, with other lower level signals peaking towards other known local mobile radio masts. The biggest signals were coming from the W-CDMA (Wideband - Code Division Multiple Access) carriers in the 3G 2110 to 2170MHz band. **Photo 1** shows the spectrum I received from 800MHz to 2400MHz. The strongest signal is at approximately 2160MHz and is a 3.5MHz wide spread spectrum W-CDMA carrier at a level of -32dBm. Using 3MHz video and 3MHz resolution bandwidth on the analyser most of the signal is captured. The peak level will be slightly higher than the marker indicates. The 3G signals were not apparent when I last checked the output of this mobile radio mast. This service has probably been added recently.

There are actually two adjacent 3G signals, one a few dB weaker than the other. The narrow bandwidth GSM signals show actual peak levels, since all of the modulated carrier is captured. The signal at 1840MHz is a GSM1800MHz carrier at -40dBm whilst the one at 900MHz is a GSM900 carrier at -55dBm. The total feeder loss between the Yagi and the spectrum analyser (HP 8592L) is approximately 10dB due to the use of a small diameter jumper cable between the cable rack and the analyser input. At 2160MHz the signal level at the Yagi connection point is 10dB higher than shown, or approximately -22dBm.

Since the antenna is not resonant within any of the bands shown the true levels may be many dB higher than shown when using a suitable resonant antenna. However, these are the levels delivered by the 13cm band Yagi antenna to the coaxial feeder.

My masthead preamplifier is situated close to the Yagi feed point and has close to 30dB gain at 2160MHz. A gain peak below the frequency of minimum noise figure is typical of many low noise preamplifiers. With 30dB gain the preamplifier delivers a 2160MHz 3G signal at a level of (-22dBm + 30dB – 4dB) = +4dBm to the transverter. (The -4dB factor is the loss of my receiver feeder at 2160MHz.) If the second 3G carrier were at the same level as the first carrier then the PEP (peak envelope power) of the combined 3G signals would be 6dB higher, at +10dBm. It is no wonder that the 13cm transverter was complaining!

I have often heard amateurs commenting that when they have added a preamplifier to their system they suffered overload problems from strong signals and that the problem was due to the preamplifier being 'overloaded'. This may not be the case and that the problem was due to the much larger signal levels being presented to the following receiver stages such as the RF stage or the first mixer. The only recourse is to consult a programme like *AppCAD* **[5]** *NoiseCalc* to determine the weakest stage and then to do something about incorporating a higher dynamic range stage in its place, if practical.

In the case of 13cm out-of-band strong signals the answer is better filtering of the RF passband. Although this transverter already incorporates an exceptionally good 5 pole RF filter, it is located between the RF stage and the mixer. This is the usual place for an RF filter used to reduce image noise contributions and image band signals. Unfortunately it leaves the transverter RF stage(s) unprotected. Many microwave band low noise RF stages are wideband and this invites problems from out-of-band signals. A masthead preamplifier may then introduce strong in and out-of-band signals into the system. Not much can be done to improve the in-band strong signal situation with extra filtering.

Connecting a good filter ahead of the masthead preamplifier will filter out many of the out-of-band signals but is not usually recommended as its loss will add directly to the receiver system noise figure and in extreme cases will make the system less \sensitive than if no filter were used and the transverter were connected directly to the

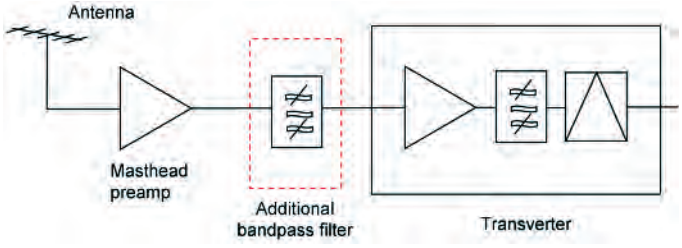


FIGURE 1: System block diagram showing the extra 13cm band pass filter at the transverter receiver input.

PHOTO 2: G0EWN/P operating from Roper Hill in the record-breaking lightwave contact. Photo: G3PHO.

PHOTO 3: ZL2TAL operating ZL2IP's 6cm band equipment from Mt. Egmont in New Zealand. Photo: ZL2IP.

(lossy) receiver coaxial feeder. A better solution may be to add the filter after the masthead preamplifier, but ahead of the transverter. In my case, adding another 5 pole surplus Collins Radio filter at the transverter input totally removed the offending 3G and lower band signals whilst retaining a very low system noise figure. **Figure 1** shows how the extra filter is located in the system. I have never heard 13cm so quiet! Of course, the various beacons and amateur signals are still there.

Out of interest, I repeated the exercise on 3.4GHz where my 112-element quad loop Yagi (QLY) delivers a GSM1800MHz signal of approximately -34dBm at the Yagi feed point. The GSM900 and 3G signals are below the spectrum analyser noise floor. The response of the 9cm band QLY is obviously well down in the three main mobile phone bands.

For those of you who also live close to a mobile radio mast, additional filtering looks like it is rapidly becoming a necessity if we are to continue using some of the lower microwave bands.

I have yet to determine if the phase noise performance of the Apollo 32 based LO is going to cause problems in the presence of strong signals. I'm sure I will have more to say on this subject in a later column.

MICROWAVE NEWS. I have not received any UK microwave band activity reports over the Christmas period. However, there are a number of interesting microwave and lightwave news items to report.

NEW UK LIGHTWAVE DISTANCE RECORD. Following on nicely from the Lightwave article in last month's column *[and this month's technical article – Ed.]* I am pleased to report that a new distance record has been set by a well-known group of UK microwave operators.

Late in the afternoon of 8 January Gordon, G0EWN/P (with G3PHO), and Barry, G8AGN/P, set a new UK lightwave distance record with a two way voice contact over a path distance of 87km. G0EWN/P was situated at Roper Hill (IO93EI), on the West side of Sheffield, whilst G8AGN/P was situated 1.5km NE of Pocklington (IO93PW). Reports of 52 were exchanged but it is thought likely that the reports would have been better if they had waited for a fully darkened sky.

The equipment at both ends was based on 3W Luxeon transmitters with baseband AM modulation. The receivers used KA7OEI front ends. Separate A4 Fresnel lenses were used for both transmit and receive. **Photo 2** shows G0EWN/P operating his lightwave transmitter from Roper Hill.

The previous record was set in 2003 by G8LSD/P and G0MRF/P using red light lasers over a path length of 76km. Congratulations to the two teams on this fine achievement.

NEW ZL 5.7GHz BAND DISTANCE RECORD. On 3 January Ted, ZL2IP/P, operating from Mt Egmont worked Steve, ZL1TPH on Cape Reinga on 5760MHz, setting a new ZL 5.7GHz band distance record of 551km.

They easily worked over the same path last year on 10GHz, but 6cm proved a bit more difficult. After making initial contact using 144MHz talkback they quickly made contact on 6cm. Signals were rather weak initially. The problem turned out to be a faulty antenna changeover relay in Steve's equipment. Once this was found and bypassed, signals increased to 59 both ways.

Steve ran 100W to a 1.2m dish whilst Ted had 11W to a 60cm dish. **Photo 3** shows Ray, ZL2TAL, operating Ted's 6cm band equipment, on a previous visit to the Mt Egmont site.

METEOR SCATTER AT 1296MHz. On 4 January, Zdenek, OK1DFC, reports a successful 1.3GHz meteor scatter (MS) contact with RW7A (operated by Nikolaj, RW6AG) using FSK441. RW7A was running 300W to a 3m dish, whilst Zdenek was running 1.5kW to a 10m dish. They completed their contact outside the peak of the shower due to Nikolaj working 432MHz MS skeds around the peak of the Quadrantids meteor shower.

Meteor scatter on 1.3GHz is very uncommon and reflections are both short lived and relatively weak. The use of high EIRP by both stations undoubtedly added to the success of the contact. Congratulations to Zdenek and Nikolaj on their fine achievement.

CORRECTION. I inadvertently gave the wrong locator for Martin, GM8IE, in the January column. His locator is IO78HF.

FORTHCOMING MICROWAVE EVENTS 2011/2012

Martlesham Microwave Round Table, 17 April 2011. Note the move of MMRT to the spring. Details: G3XDY, g3xdy@btinternet.com

Microwave Update. Enfield, Connecticut, USA, 13-16 October 2011. Details: Bruce Wood, N2LIV, n2liv@arrl.net (conference chairman)

15th International EME Conference, Cambridge, UK, 16-19 August 2012. Details: www.eme2012.com

WEBSEARCH

[1] OK1DFC web page www.ok1dfc.com/EME/technic/LO13cm/lo.htm
[2] OK1DFC transverter: *14th International EME Conference Proceedings*, 2010, Dallas, 'An all band 2.3/2.4GHz EME transverter', NTMS/ARRL
[3] Apollo 32: www.downeastmicrowave.com/PDF/Manuals/A32RFK.pdf
[4] N5AC: www.n5ac.com
[5] *AppCAD*: www.hp.woodshot.com

Extended λ/4 vertical for 40m

Using a fibreglass pole and simple materials to make an antenna with good performance

PHOTO 1: General view of the extended 40m vertical. Note the tilt-over base and box containing the matching components.

A LITTLE HISTORY. I moved to this QTH more than 30 years ago. It has a long garden, about one acre in size, so early aerials for the HF bands were predominantly long wires and full length dipoles. A small stream flows through the garden and so there is probably a fairly low resistance earth below these wire structures. 80m SSB rapidly became a favoured band for DX working. For this I use a full sized 80m dipole at a height of 15 metres. For the other HF bands, a Butternut HF6V-X was chosen, mounted at ground level and fed against an extensive radial array of 1.5mm copper wire, buried just below turf level in the surrounding lawns. This provided coverage of the 10, 15, 20 and 40m bands. Although the Butternut also covers 80m, the dipole was vastly superior in performance.

About 15 years ago, a major construction project saw the appearance of a Cushcraft A3S 3-element Yagi mounted on a 10.7 metre standard Tennamast. The major construction part of the project was the digging of the 1 x 1 x 1m hole in the garden and concreting in the Tennamast support socket!

The Butternut vertical was immediately relegated to just providing service on 40m, as a rather short λ/4 wave vertical. It had suffered quite serious corrosion during its 20+ years of continuous outdoor exposure, to the extent that all nuts, screws and clamps were corroded solid and not adjustable. The coax was of similar vintage and condition, displaying black and wet corroded braiding at several exploratory investigations along its length.

In 2009, with a wet summer turning into a delightful autumn and thoughts of the contest season and its wealth of DX approaching, a few ideas went through my mind:

1. 80m DX can be good but 40m DX can be even better
2. My aged and corroded 40 metre vertical – the Butternut – was now little better than a dummy load
3. Lightweight telescopic fibreglass poles are now readily available
4. An extensive radial earth system, suitable for a vertical is already in place

So, the project almost designed itself – the new aerial would be a λ/4 vertical for 40m, coax fed against the existing radial earth system.

PLANNING THE DESIGN. Whilst I have used telescopic fibreglass fishing poles for occasional portable use, the planned vertical was for a permanent installation. I selected a 12 metre high telescopic fibreglass mast from www.spiderbeam.net as this has the height and probably the durability necessary for this planned permanent installation. I should mention at this stage that it is important to also buy the clamps that Spiderbeam provide to hold the telescopic sections in place when extended. During the early stages of this construction I used PVC insulation tape but this material creeps. I initially noticed the creep as a worsening of the SWR; no doubt this was due to the overall length of the vertical section reducing gradually due to the creepage.

Every aerial I have ever built in the 40+ years I have been licensed has required adjustment and has never worked exactly as the design, so a key design component was that the 40m vertical would be a tilt-over structure.

At a height of 12 metres the telescopic mast would be somewhat longer than is required for a full λ/4, tuned to the design frequency of 7100kHz. It was considered that there were benefits from making use of the extra height. It would mean an increased resistive component of the feed point load, thereby increasing the efficiency of the aerial when fed against an unquantified but hopefully fairly low resistance radial earth system, and pushing the current maximum a little higher up the pole.

DESIGNING THE LC MATCHING NETWORK. I decided to use 1.5mm enamelled copper wire as the radiating element, running it up the inside of the telescopic pole. For matching into RG 213-U coax cable, I referred to **[1]**, which has been very useful to me over many years. The overall height of the aerial from the feedpoint matching network to the end of the radiating element was measured at 12.45 metres. The dimensional ratio of the aerial is calculated by dividing the aerial height by the radiating element diameter, 12450mm/1.5mm = 8300.

For a frequency of 7100kHz, an electrical λ/4 can be calculated (in metres) as λ/4 = 75.15 / f (MHz) = 10.58m. This is the same as 90° electrical length (one quarter of the 360° circle that represents one complete cycle of a sine wave).

For an actual length of 12.45m at 7100kHz, the radiator's electrical length is 90° x (12.45/10.58) = 106°.

RESISTIVE AND REACTIVE COMPONENTS. Whilst the resistive and reactive components can be calculated, graphs from **[1]** (**Figure 1** and **Figure 2**) provide a fairly painless way of determining the figures. The resistive component can be estimated from Figure 1, which has an approximate 106° electrical length line drawn in red. Although the dimensional (height/diameter) ratio of the aerial, 8300, is off the graph, it's fairly clear that the value is tending to around 70Ω for ratios above 1000. Likewise, extending the reactance

graph of Figure 2 suggests that the reactance is about +160Ω. So the antenna impedance is likely to be around 70 + j160Ω. In order to feed this from a 50Ω source we need a matching network of some kind.

MATCHING NETWORK. With the resistive component of the load greater in value than that of the RG 213-U coax, the matching network is as shown in **Figure 3**. No 'shortening factor' was applied to calculating the length of an electrical λ/4, as the diameter of the radiating wire is very small relative to the length of the aerial.

To calculate the values of L1 and C1, the freely available DOS programs of G4FGQ www.zerobeat.net/G4FGQ/ proved invaluable and very easy to use. The program *LTUNER*, when provided with all the design parameters so far discussed, defined for us that L1=3.0μH and C1=260pF.

Program *SOLNOID3* took the guesswork out of designing L1 and came up with a coil of 11 turns using 1.5mm enamelled copper wire, 50mm in diameter and 75mm long.

As **Photo 2** shows, theory and practice did not quite come together and the coil needed squeezing somewhat to achieve best match to the coax.

MAKING THE LC TUNING NETWORK. A visit to the local supermarket provided the ideal weatherproof housing for the network – a 13 x 20cm, 2 litre polythene food box with a clip-on lid.

An aluminium base plate was selected that just comfortably fitted inside the base of the polythene box. This was used to mount C1, a 350pF wide-spaced variable capacitor, with L1 supported on small stand-off ceramic insulators. A small cutout in the base of the poly box allows access to the ceramic connecting block that joins the coax feeder line to the network. In order to seal the end of the coax, I heated the braid using a soldering iron and then pressed a candle onto the hot braid.

Although the coax connection is largely protected by the poly box, to further reduce the probability of rain water penetrating the coax braiding, the braid connection was made quite hot using a soldering iron and a candle pressed onto the hot braid; molten candle wax flowed freely by capillary action well into the structure of the braid. Following final tuning, the holes for the spindle of C1 and the aerial element were sealed with Blu-Tack. The cut-out at the bottom of the box was left unsealed to provide ventilation and prevent condensation.

When electrically complete, the poly box was screwed through its base onto the wooden support post.

MECHANICAL CONSTRUCTION. At 3.3kg, the support structure is simple as the telescopic fibreglass pole is lightweight. The support base is formed form a 7.5cm square wooden fence post about 1.5 metres long. Two 61cm lengths of suitably drilled 2.5cm angle iron

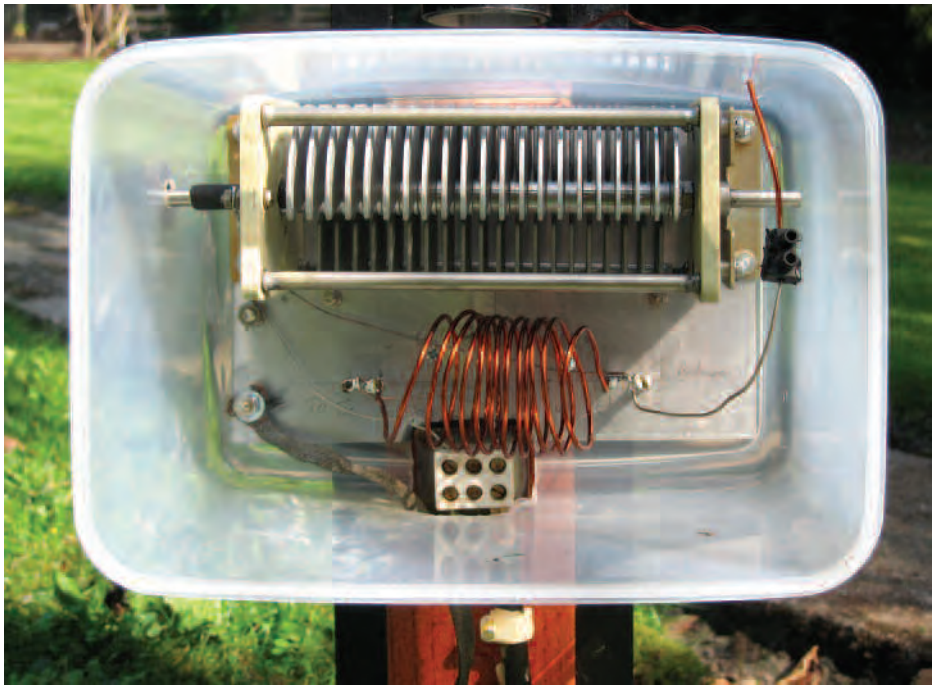


PHOTO 2: Matching unit of the extended 40m vertical.

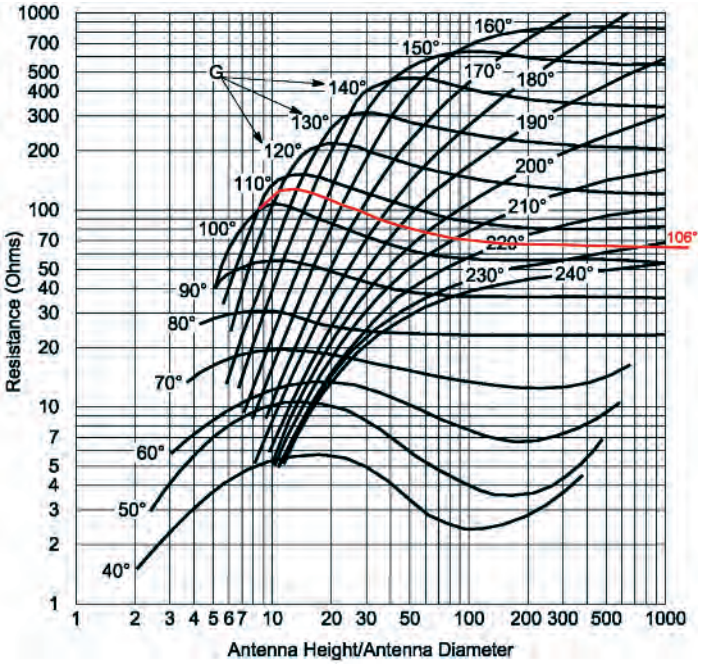


FIGURE 1: Feed-point resistances of monopoles with different antenna height/diameter ratios above a perfect ground (from [1], courtesy ARRL).

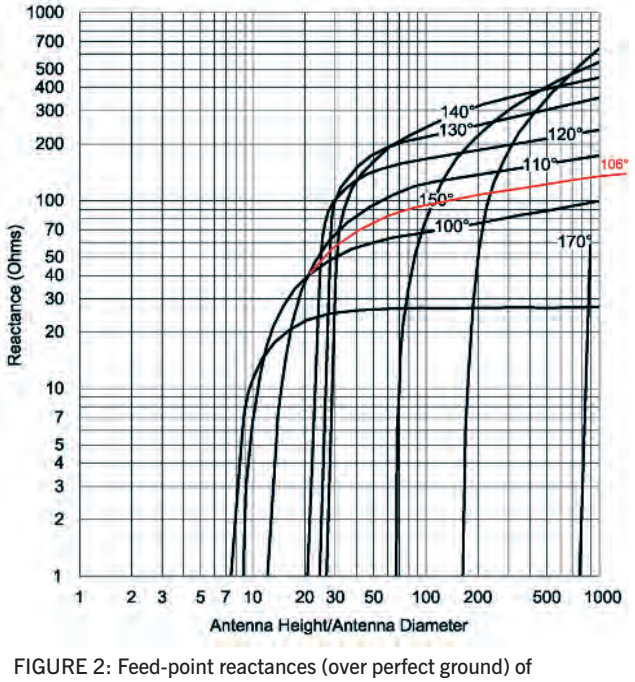


FIGURE 2: Feed-point reactances (over perfect ground) of monopoles with different antenna height/diameter ratios (edited from [1], courtesy ARRL).

PHOTO 3: General mechanical arrangement of the support pole, angle iron and fibreglass pole.

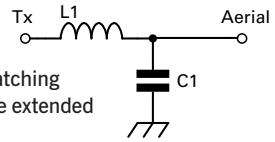


FIGURE 3: Matching network for the extended 40m vertical.

were screwed to the fence post to provide an attachment point and pivot for the fibreglass pole. **Photo 3** shows the general arrangement. The fence post was liberally soaked in anti-rot compound and then sunk about 70cm into the ground, using a spirit level to check it was perfectly vertical. The hole was back filled with broken brick rubble which was hammered down with an iron rod, checking for vertical all the time. Finally, a bag of fast setting fence post premix concrete was used to cap off the hole.

In order to strengthen the base of the fibreglass pole, a 50cm length of 50mm outside diameter, 5mm wall thickness stainless steel tube was acquired and placed inside the bottom of the pole. The inside diameter of the fibreglass is 51mm, so a few turns of insulating tape were carefully applied to the metal tube to ensure a snug fit. The assembly was then drilled to accept the bolts that secure the pole to the angle iron uprights. Spacers cut from brass rod were used along with washers to accommodate the difference between the diameter of the pole and the gap between the angle irons.

CONNECTING THE AERIAL. Close to the support post, the telescopic pole was fully extended, horizontally. The telescopic sections of the pole were temporarily secured with PVC tape and the base section was lightly secured to the angle iron supports. A 15m length of 1.5mm enamelled copper wire was fed into the far, narrow end of the telescopic mast and passed right through the pole to emerge near the tuning network; several thrusts with the wire where necessary to find a route through the inserted steel support. When all the wire was inserted, the end of the copper wire was looped to hook over the end of the far end section of the fibre glass pole and then firmly secured with self amalgamating tape in a manner which also sealed the top end of the pole against water ingress.

THE RADIAL EARTH SYSTEM. The construction of the earthing system had been undertaken many years earlier. A ring of copper braid was positioned around the support structure of the aerial. With the availability of a fairly large quantity of 1.5mm enamelled copper wire, lengths were laid out on top of the lawn in straight lines as far as they would reach before meeting the property boundary or other obstacle. The hard job was slitting the top turf with a spade and pushing the copper wire 2 to 3cm below turf level. After a full days 'slitting', about 40 to 50 lengths of wire, of varying lengths, were properly buried. The central ends were then soldered to the copper braid ring, which was buried just below ground level. A single soldered braid connection was fed directly from this into the LC network box.

TUNING THE AERIAL. The fibreglass pole is light and it was a simple, if fiddly, one-man task to elevate the pole between the angle iron supports and hold it in position with an arm and shoulder while fitting the bolt, spacers and washers (Photo 3).

Once the pole was mechanically upright, the aerial wire was cut to a convenient length to connect within the network box. A 70cm length of thin clear plastic tube was pushed over the aerial wire within the pole, to provide better insulation between the wire aerial and the stainless steel strengthening insert. Finally, the wire end was fed through a small hole drilled in the top of the box, as seen in Photo 2. A choc-block terminal provides the connection between the tuner and the radiating element.

I ran a length of RG213-U 50Ω coax feeder from the shack to the antenna. A couple of metres from the antenna base I cut the cable and installed PL259 plugs, coupled by a standard joiner. This meant that I could conveniently connect my MFJ 259 SWR analyser to the aerial to aid setup. It also means that there is an easy way to replace the last few metres of coax in case of damage by water ingress or wildlife. The whole tuning exercise took only minutes to complete and required just a slight compression of the coil and turning of the capacitor to achieve a perfect 1:1 match at the design frequency, 7100kHz.

COMPLETION. After tuning, I used the Jubilee clips from Spiderbeam to replace the PVC tape that I'd used temporarily to hold the mast sections erect. I also used self-amalgamating tape to waterproof the PL359 joint in the feeder cable.

Although the 12m pole would appear to be self supporting even in fairly windy conditions, I decided to guy it. I used 3 guys of 3mm dark green polypropylene cord from about half way up the pole to suitable ground anchors.

PERFORMANCE. My rig is an FT-1000MP and 400W linear amplifier. 40m activity has mostly been on SSB between 9-10.30pm and I'm delighted with the aerial's performance. As expected, the VSWR match is perfect at 7100kHz, where there is no indicated reflected power; at the band edges the SWR is 1.3:1.

You can tell when an aerial's working well: the first call usually gets through! This has been my experience with this vertical when calling at 300W PEP. Transatlantic calls usually get 5-8/9+ reports, with VK getting 5-8.

AND NOW, WITH HINDSIGHT. If re-building this aerial, there are two things I would change. First, I would install a slightly longer support post so that the network box could be positioned at about eye-level when kneeling down on the grass. I had to lie flat on my stomach to make all the network interconnections: it's not easy to see at that angle when wearing varifocal glasses! Secondly, I would choose slightly larger angle iron to support the pole. The 2.5cm dimension is rather small when using large bolts and I needed to elongate one of the drilled holes to be able to turn the nut properly. But this aside, the project was pretty easy and has worked exceptionally well.

80m ADDENDUM. I understand that Spiderbeam are now offering a 26m version of the fibreglass telescopic pole used in this article. This would form an excellent support for an extended quarter wave vertical for the DX portion of the 80m band. At 26 metres the pole (together with some interconnecting cable within the tuner) would have an electrical length of approximately 120° at 3795kHz. From the Figures it can be determined that a 1.1mm copper wire within the pole would present a feed point load of around 120 + j250Ω. Using *LTUNER*, L1 = 7.2μH, C1 = 360pF. *SOLNOID3* informs us that a suitable air cored coil would be 13 turns of 1.1mm enamelled copper wire, coil length = 75mm, coil diameter = 65mm.

REFERENCES

[1] *Low-Band DXing* by John Devoldere, ON4UN

TYT TH-UVF1

A striking dual band handheld for even less money!

NEW BREED. We were impressed when we reviewed the TYT TH-UVF1 dual band handheld. It is one of the new breed of inexpensive dual banders emerging from the Far East. It feels nice in the hand and has a slightly space-age look about it thanks to its bright metal speaker grille.

Rated at 5W output on 2m and 4W on 70cm, it comes with a range of accessories including a 1500mAh Li-Ion battery, flexible aerial, hand strap, belt clip, drop-in charger with linear plug-top PSU and a cigarette lighter charger lead. Charging the battery from flat takes about 5 hours; a red 'charging' LED turns green when the battery is full.

FIRST IMPRESSIONS. Everything goes together quite nicely and the radio feels nice in your hand: solid, smooth-but-grippable and not too heavy. The 17cm antenna is a normal SMA type, so it's easy to connect external aerials.

The LCD is a clear dot matrix that can be backlit in blue, orange or purple. It has two rows of 7 characters plus various annunciators. On 6.25 and 12.5kHz channels the last 25, 5 or 75 are around half the height of the main figures. The keypad is easy to read but not backlit.

IN USE. You can enter a frequency via the numeric keypad, or step up and down using the arrow keys. Pressing the U/V button switches bands. Other things are achieved using the menu system, accessed via the red MENU key. There are some 34 menu options, all documented adequately in the manual. The first 10 are easily accessed by pressing MENU followed by one of the numeric keys, which are also labelled with their menu functions.

I found switching repeater shift on and off quite awkward, because it's done in menu number 34, 'S-D' (for Shift Direction). But you can set up and name the 128 memories for commonly used simplex channels and repeaters. The optional TH-UVF1 control software and associated lead may make this easier. There's full CTCSS encode and decode.

Transmit audio is quite good, while the receive side sounds a little trebly – or, perhaps, 'punchy'. Deviation can be Wide (5kHz) or Narrow (2.5kHz). Receive sensitivity seemed excellent.

SPECIAL FEATURES. There is extended receive, covering 136-174, 350-390 and 400-520MHz. I liked the voice synthesiser that announces key presses and menu options – including menu settings. The FM radio is a nice touch and it has 25 dedicated memories. A built in VOX can be used with an external mic; a compander for increased 'talk power', a switchable receive power saver, battery voltage meter and many more features. The radio supports dual receive but is not capable of full duplex operation.

CONCLUSION. The TYT UVF1 is a workmanlike and robust-feeling handheld that includes all the features you'd expect from a dual-bander.

Adventures in optical communication (part 1)

A small group of amateurs are doing amazing things in the terahertz bands.

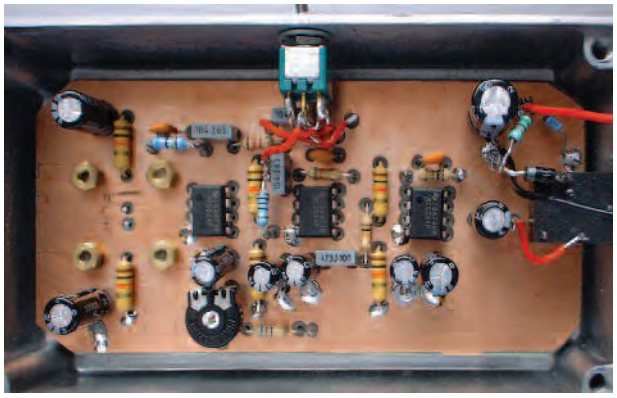


PHOTO 1: Original AM receive head. The switch adjusts bandwidth between CW and voice.

INTRODUCTION. I have been interested in optical communication, on and off, for most of my life. In the 1960s it was with audio amplifiers, phototransistors and 6V filament lamps. With the advent of bright, narrow-angle LEDs in the 80s, the idea of optical communication briefly rose again. This time I combined my hobbies of radio and astronomy by fitting an 8° LED instead of the eyepiece to my telescope, using it as a projector. The receiver was little more than an audio amplifier connected to a reverse biased photodiode placed at the focus of a small lens. The LED was driven by a 555 timer IC producing an audio frequency square wave, keyed in Morse. I got about a mile if my memory serves me right.

Early in 2008 I found myself reading the microwave section of the 8th edition of the *RSGB Radio Communication Handbook*. I was interested to read the article on laser communication by David Bowman, G0MRF. This was a life-changing event as, since that day, I have steadily evolved better and better optical communication systems. My initial experiments were with AM, progressing to FM and later all-mode operation (including SSB via light!). This article describes what I've been up to.

THE AM SYSTEM. G0MRF's system had separate head units for transmission (a laser) and reception (an expensive OPT301 opto IC). I decided that a cheaper SFH2030 photodiode and a low-noise NE5534 op-amp would suit my experiments. David also generated a precise 488Hz Morse tone and a very narrow filter in the receiver. I used this outline, adding a few little innovations of my own such as a 20kHz pulse width modulator (PWM) for voice communication and a switch in the receiver filter circuit to broaden the bandwidth to something suitable for voice communications. The photodiode and amplifier were mounted in a 4 x 2 x 1 inch diecast box (**Photos 1** and **2**), acting as a receive head. The final stage of the receiver, a standard LM386 audio amplifier IC, volume control and loudspeaker, were contained in a separate box. A 3.5mm stereo jack plug, socket and lead were used to connect the boxes, carrying power, signal and ground. The transmitter circuit also had its own separate box, although there is no reason why it could not be accommodated in the receive audio amplifier and speaker box. **Figure 1** shows the circuit diagram of the receive head.

The transmitter circuit mentioned earlier borrowed ideas from David's circuit but I introduced the PWM voice circuit. I also altered the Morse circuit to give maximum light output on key up, which helps when aligning over a distance. The driver transistor produced an output of 3V at around 30mA, ideal for the average laser pen, laser pointer or laser spirit level. I also included an output for a front panel LED so that it would not only indicate when switched on, but it would act as a low power transmitter beacon for short range testing (which turned out to be very useful). **Figure 2** shows the CW/PWM transmitter circuit diagram and **Photo 3** shows the completed unit.

At this stage I was working alone, setting up the transmitter at home (I am lucky enough to have a good view over the surrounding countryside) and going out to the spot where I aimed the laser. I discovered that I could receive the tone 6km away with no lens on the receiver; at 15km, a one inch lens was required.

FIRST DEMONSTRATION. A group of amateur friends meet occasionally at my QTH: Brian, G8KPD, Gordon, G8PNN, Peter, G8POG and Tony, G8NPP (who is sadly no longer with us: he was killed in a traffic accident driving up to my QTH in December 2008 and the group as a whole wish to dedicate this project to his

PHOTO 2: The completed AM receive head, showing the photo diode and mounting tube.

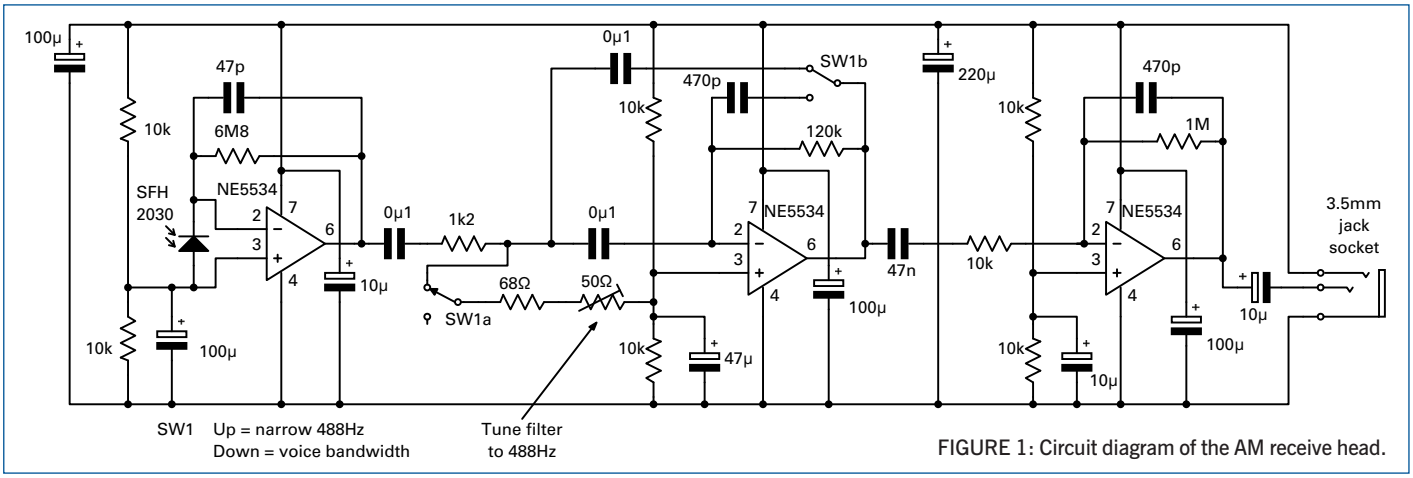


FIGURE 1: Circuit diagram of the AM receive head.

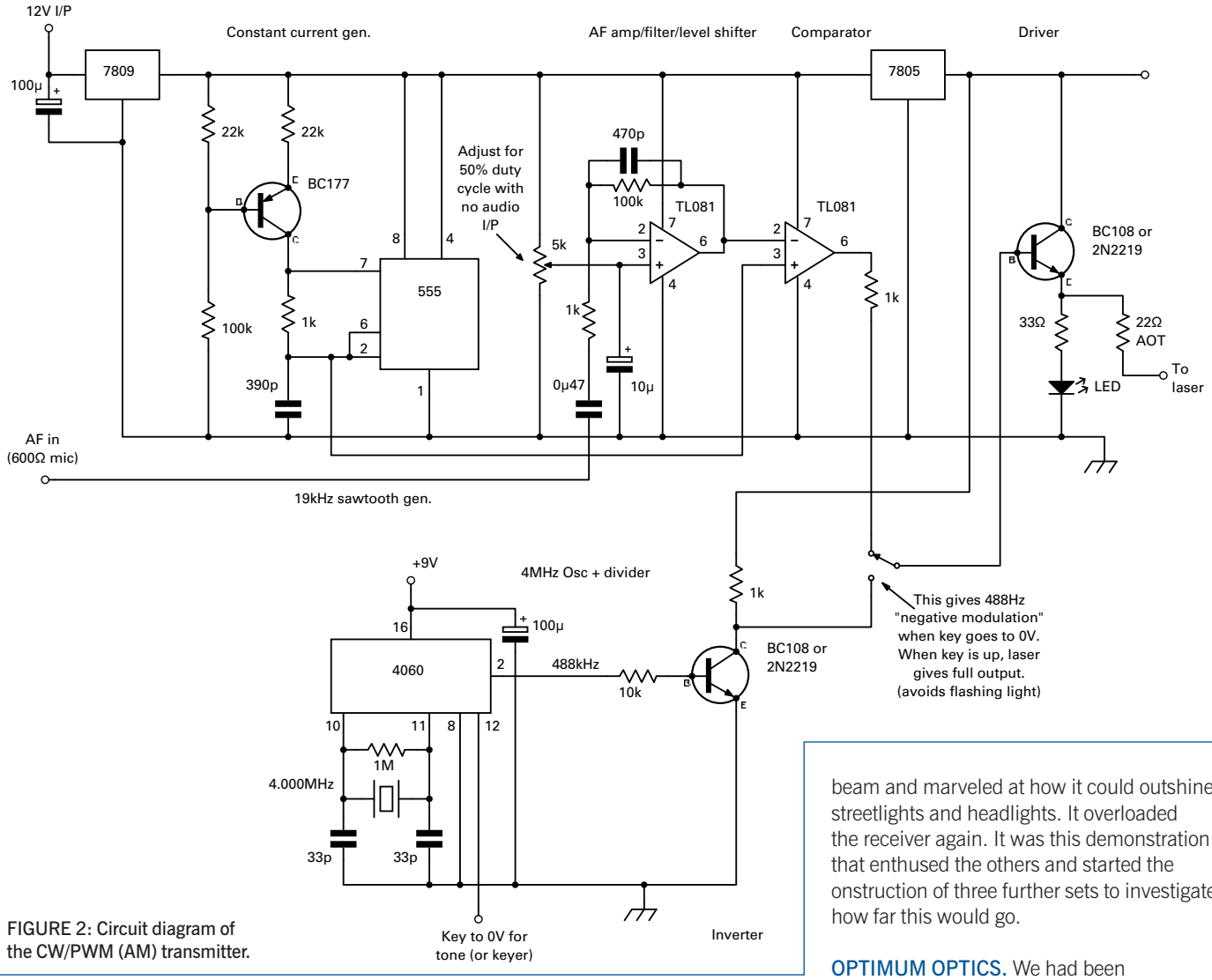


FIGURE 2: Circuit diagram of the CW/PWM (AM) transmitter.

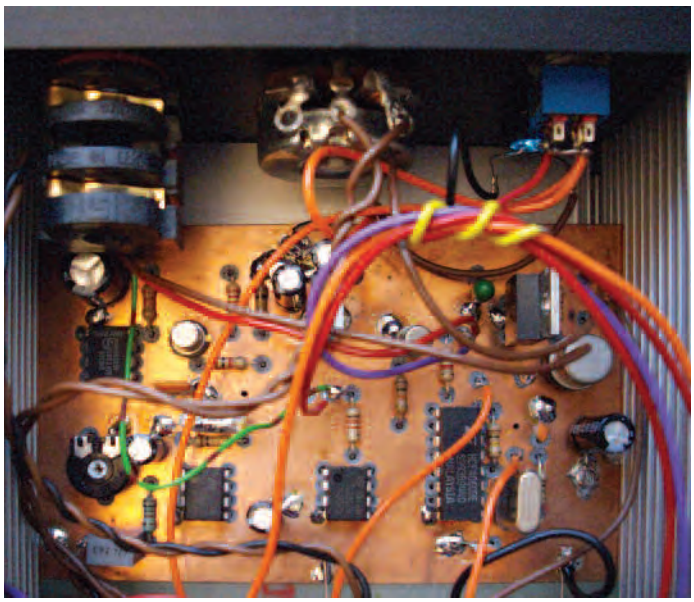


PHOTO 3: Completed CW/PWM transmitter.

memory). I decided to demonstrate the optical comms project to them. For this I aimed the laser about 1m above a hill 1km away, continuing to a second, higher hill 2.5km distant, the beam burying itself safely in a hedge at that point. A word about safety here. Although a 1mW laser is unlikely to do any damage, always make sure there is no chance of someone staring down the beam. At 1km the beam from a cheap laser appears bright although not blinding, but always err on the side of safety.

We walked up the local hill and, at first, could not even see the beam. The receiver was switched on and pointed back to my QTH. Immediately, the tone was audible and I used this as a beacon to find the beam proper. When located, it gave about a 15cm diameter patch of red light. The receiver was driven into overload when placed in the patch of light, even without a lens. We then travelled to the more distant hill, found the beam and marveled at how it could outshine streetlights and headlights. It overloaded the receiver again. It was this demonstration that enthused the others and started the onstruction of three further sets to investigate how far this would go.

OPTIMUM OPTICS. We had been experimenting with various magnifying lenses to hand. All that is required is to collect as much of the available beam as possible and concentrate it on to the photodiode in much the same way as a microwave dish focuses radio waves on to the feed. Here I am going to cut a long story short and go straight for the optimum system that we have latterly developed. This system gives the simple PWM equipment a range of some 15km (10 miles).

The optical system that evolved used a length of 110mm waste pipe, an end cap and a joining piece (all available from DIY warehouses). We located a Blue Spot 100mm magnifying glass at a pound shop, cut off the handle and filed off the protrusion where the handle met the rim. This was found to be a tight push fit into the end of the tube. (Be careful at this point: the band around the lens is not parallel. Place it narrow end upwards on a sturdy table and push the tube over it. When the tube rim touches the table top, the lens is properly installed.) **Photo 4** shows the constituent parts.

The cylinder on the end cap was cut down to 20mm and the centre of the blanking disc drilled out to allow light to pass through. We cut a 38mm dia hole with a hole punch. The joining piece was cut exactly in half along its

PHOTO 4: Parts used in constructing the receive optics.

PHOTO 5: The complete receiver.

length. One half was used to push the end cap into, the cut end then was slid over the tube on the far end from the lens, making a loose fit that can be improved by using a turn or two of PVC insulating tape on the tube. The length of the tube depends on the lens. You need to be able to produce a focused image of a distant street lamp on the photo diode. The lenses were found to vary in focal length slightly, most required around 285mm from lens centre to the diode surface.

LASERS. Originally we had obtained our lasers from Lidl, where a laser level kit was often available for £10. The kit includes a tripod, adjustable head and a spirit level with the laser in it. The spirit level can be modified to take two connections out to a 3.5mm socket to use it as the transmit head. A second kit provides all you need to mount the receive tube. Simply bolt a section of the aluminum spirit level to two wall clips (also useful for marking an accurate line around the tube before cutting) and slot the tube in place through the hoops. This means that a laser level is sacrificed to science, but this is the cheapest and easiest way. A further wall clip or two can be used to support a finder telescope or, as in my case, half a pair of cheap Lidl binoculars - an essential aid to lining up. This lot then clamps in the adjustable head. A completed unit is shown in **Photo 5**, which also shows some 40mm waste pipe fittings used to hold the receive head. This arrangement also enables different heads to be slid in and out and for fine tuning the focus of the system, although once the focus is set it doesn't normally need adjusting.

I used another half of a joining piece as a lens hood. This also seemed to finish the system off well. It has also proved useful as a holder for irises - cardboard discs with holes in - that act as signal attenuators. These are used to assess how little signal is needed at a given distance, as an aid to calculating the potential range of the system. A 2 inch diameter hole gives 6dB attenuation and a 1 inch hole is 12dB attenuation. Ignoring atmospheric effects, these equate to signal levels at twice and four times the range respectively.

OPERATION. AM works, after a fashion. There are, however, some issues. There is a lot of QRM from street lights. The signal flutters at long distance due to atmospheric scintillation (twinkling), and aiming the laser accurately can be quite difficult. To address the latter point, we started using a high power LED and eventually got this to the point where the signal could be detected 34km away.

POWER LED. The advantage of a LED transmitter is that it is much easier to aim because it has a broader beam than the laser. Also, you cannot be accused of shining a laser over the countryside and, since the power density is much lower, it is safer. That said, a 1W LED using these optics still looks very bright, even when lined up over a distance of several kilometers!

Changing from a laser to a power LED is an easy move. You will need to make another tube and lens system - so there is a use for the second tripod, head and spirit level: to hold the second tube. At the rear of the end cap, a diecast box makes a good mount for the power LED. The completed assembly looks rather like the detector in Photo 4.

The LED drive circuit (**Figure 3**) is an N-channel power MOSFET, which requires a small heatsink. The gate goes to the transmit electronics, the source to 0V and the drain to the LED cathode. The anode goes to +12V.

LED operation reduces the operating noise somewhat, because the wider (optical) beam doesn't suffer from the 'speckle' that you get with lasers. But we are still using an AM-based system, which has pronounced issues with fluttering signals plus QRM from streetlights and road traffic. These issues made me contemplate how could I get round these problems. I began searching the web looking for 'laser dx' and 'optical communication'. I found a wealth of material out there. A great source of information is the Optical Links site run by Tim Toast [1]. You can read all about the progress various groups of optical communication enthusiasts have made mainly in Australia, Czech Republic, Finland, Germany and USA, to name just some of the major contributions. Of special note are VK7MJ and group who have communicated by voice over 160km and KA7OEI and group who have exceeded even this. To date, most have now progressed into weak signal modes and the Australia/Tasmania group have spanned the Bass Strait between Australia and Tasmania by cloudbounce, a distance of some 288km. You should see their 60 LED transmitter in action!

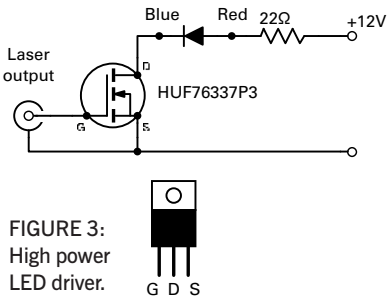
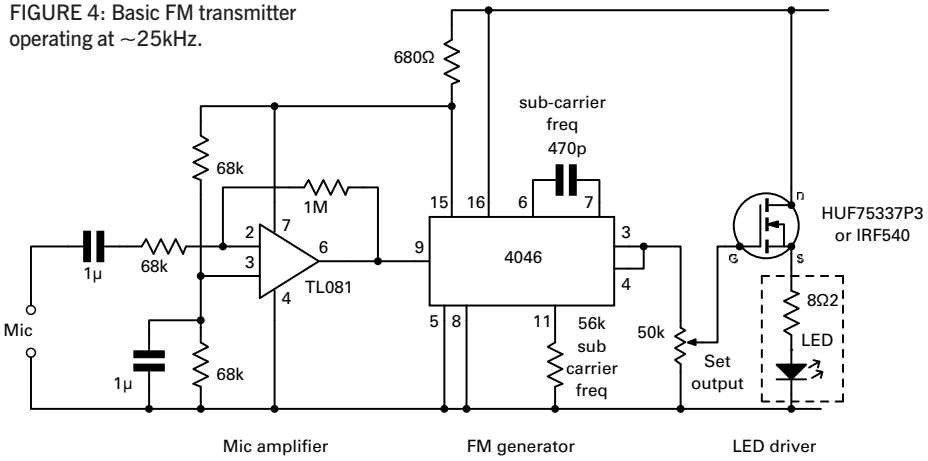
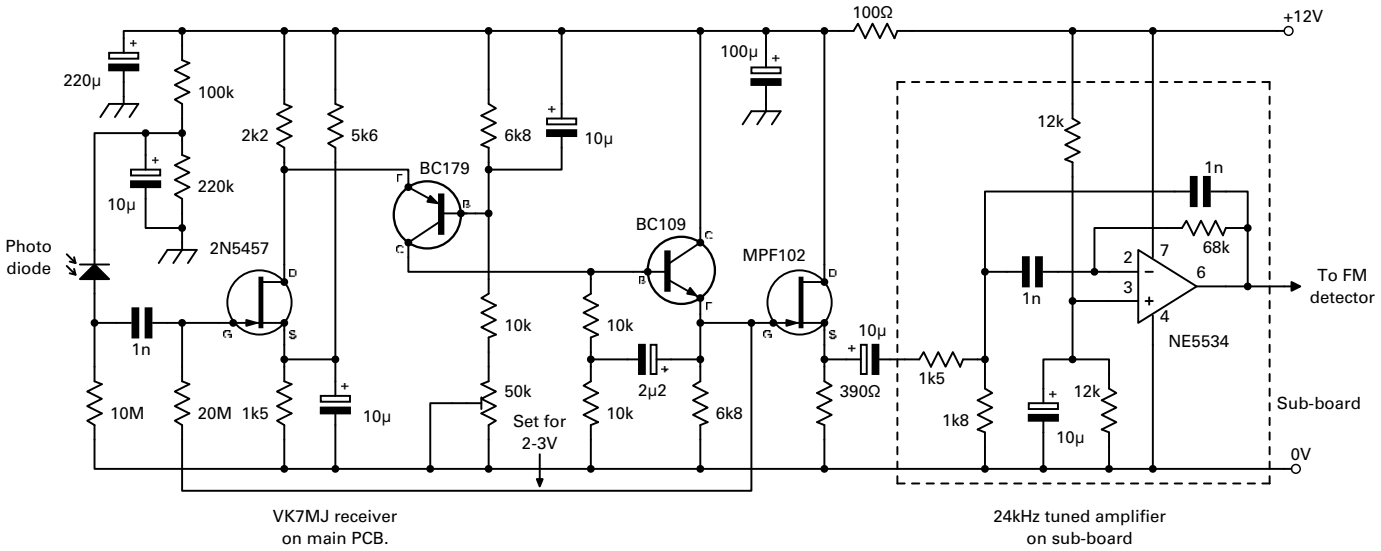


FIGURE 3: High power LED driver.

FIGURE 4: Basic FM transmitter operating at ~25kHz.





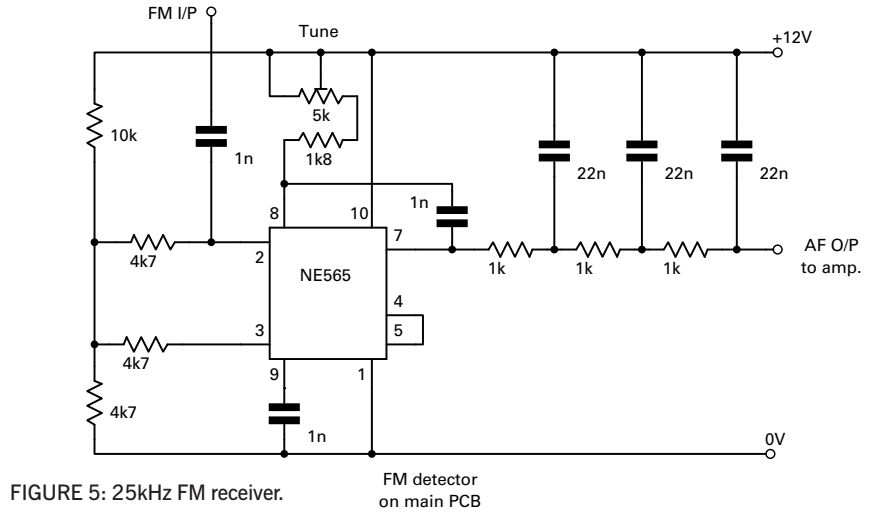


FIGURE 5: 25kHz FM receiver.

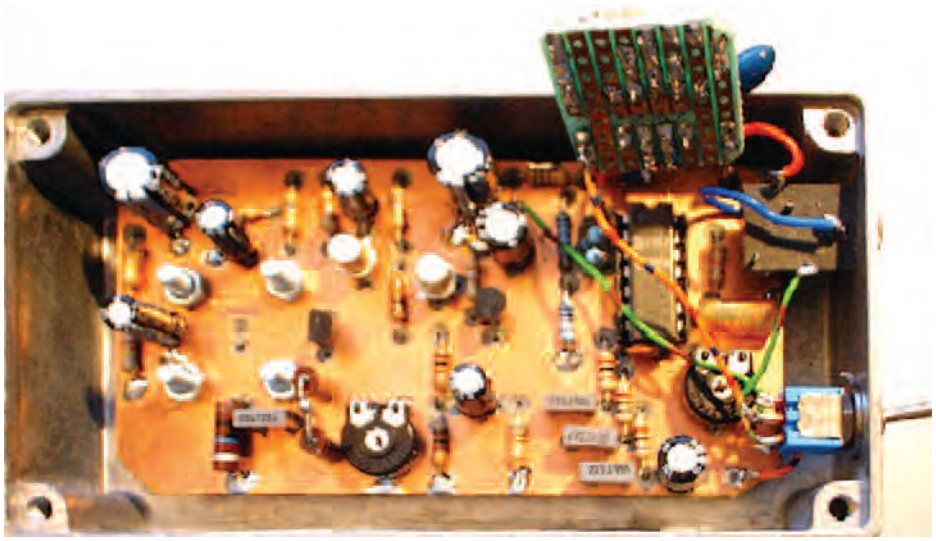


PHOTO 6: FM receiver. The stripboard houses the 24kHz amplifier (see Figure 5).

Since in the UK we do not have any huge mountains or dry flat deserts to provide long optical paths and our atmosphere is cloudy and misty most of the time, we cannot really compete on distance, so we re-defined our aims to involve immediate real-time microphone to loudspeaker communications. That's what 'does it' for us.

FM SYSTEM. In my web searches I encountered a receive head design by VK7MJ that had a frequency response from audio to 50kHz and beyond. This made me think that I could use this in an FM subcarrier system, which I decided to centre on approximately 25kHz. At this frequency the QRM from street lights would hopefully be significantly reduced (if not absent) and the effect of the limiter in an FM receiver might help overcome the fluttering of signals. This turned out to be very true.

The FM transmitter shown in **Figure 4** uses an opamp based microphone amplifier/ filter connected to a 4046 PLL generator running at 25kHz. The audio signal produces frequency modulation around the main carrier frequency. A MOSFET driver connected directly to the oscillator then provides adequate drive to the power LED head.

The receive head (**Figure 5**) starts with VK7MJ's design, followed by an amplifier tuned to the sub-carrier frequency feeding a NE566 PLL demodulator. All of this fits into the by now-standard 4 by 2 by 1 diecast box and uses the same 3.5mm stereo jack system for power and signal connections that connect to the audio amplifier/ speaker box from the AM system. All the optics remain as they were for the AM system. A later modification was to make this head switchable between AM and FM by tapping directly into the output of the original VK7MJ circuit. The first dual-mode optical receiver! Just for good measure I then went back to the transmitter box and included a linear (rather than PWM), AM transmitter circuit to complete the dual-mode setup.

RESULTS. Short range tests (our by now favorite 6.5km path across the Tyne valley) showed FM to hold much promise. Very strong signals with no QRM or flutter were achieved. Going on to the 15km path gave similarly good results even in near proximity to powerful lights. We have since used FM over all paths tried up to 34km and always found strong signals and clear communication. We wonder how far this will actually travel… But more of this next month.

WEBSEARCH

[1] http://www.aladal.net/toast/comlinks.html

SHOWROOM & MAIL ORDER:
Unit 1, Purfleet Industrial Estate, Off Juliette Way, Aveley RM15 4YA

Haydon Communications

LOCAL TO GLOBAL

TEL: 01708 862524
FAX: 01708 868441

Mail Order & showroom open:
Mon-Thurs: 10.00am - 4.00pm
Friday: 10.00am - 3.00pm.
Our showroom is 5 mins from "Dartford River Crossing"
E&OE (next day delivery available)

★ VAT INCREASE DELAYED UNTILL MARCH ★

SEE OUR NEW SHOPPING CART **www.haydon.info**

To contact our sales dept. E-mail:- admin_@haydon.info

PayPal SWITCH VISA

HF TRANCEIVERS

FT-817 ND

HF + 6m + 2m + 70cms. Incl's battery/charger + antennas. Optional case £22. Extra spare battery £49.99

OUR PRICE **£495.00**

STAR BUY - FT-817ND + extra battery + case..... £559.99

FT-857D DSP

HF + 6m + 2m + 70cm.

OUR PRICE **£619.99**

OR FT-857 + MS-1228 **£669.99**

FT-897D

Includes DSP

OUR PRICE **£719.99**

OR FT-897 + MS-1228 **£769.99**

FT-450

HF + 6m/ IF DSP

FT-450 only..... £559.99
FT-450 + MS-1228..... £619.99
FT-450AT..... £639.99
FT-450AT + MS-1228 ... £689.99

FT-950

HF + 6m IF DSP

OUR PRICE **£1219.99**

OR WITH NISSEI PS-300 **£1319.99**

FT-5000DX

FT-5000DX (200W HF + 6m)... £4299.99
FT-5000DX (above + monitor). £4749.99
FT-5000DX (above + filters) ... £5149.99

FT-2000D

FT-2000D (200W)..... £2799.99
FT-2000D + SP-2000..... £2899.99

FT-2000

FT-2000 (100W HF + 6m)..... £1999.99
FT-2000 + matching speaker.. £2099.99

MD-200

Broadcast quality dynamic mic. It sounds & looks superb. Fits 8-pin round & 8-pin modular radios. (Optional 6-pin modular adapter £19.99)

SALE PRICE **£199.99**

Yaesu MD-100A8X..... £119.99

SP-2000

External speaker + audio filters. features a large 4.7"/120mm speaker along with a 3-selection hi-cut and 2 section low cut. Dual switched input + headphone socket.

£149.99

YAESU FP-1030

Superb, high quality Yaesu. 30 amp PSU with variable voltage & multiple outlets. Fully metered & protected professional power supply.

£159.99

IC-7000

HF + 6m + 2m + 70cm. Superb IF DSP. Colour display.

£1139.00

or IC-7000 + MS-1228 £1189.00

IC-9100 new HF to 23cm... £phone

TS-2000E

HF + 6m + 2m + 70cm. Not only is this Kenwood's top machine with IF DSP, it also uses cutting-edge technology in a streamlined package.

£1439.99 TS-2000E + MS-1228 **£1489.99**

NEW TS-5905 ..... £1489.99 WITH FREE MS-1228

VHF/UHF TX

YAESU VX-8E

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

FREE EXTRA BATTERY THIS MONTH

£299.99

YAESU VX-7R

6m/2m70cm + wide RX. An amazing 6W water proof hand-held. Case £19.99. 5pk mic £32.99. Cigar lead £24.99. BNC adapter £6.00.

Silver **£229.99**

NEW YAESU FT-270 R/E

2m FM handie (keypad). Incl's batt/charger. **£99.99**

YAESU FT-7900 R/E

Latest commercial built 2m/70cm mobile + wide Rx. (Incl's DTMF mic) **£229.99**

INCLUDES FREE "DETATCH KIT"

YAESU FTM-350

2m/70cm Tcvr with APRS & dual Rx (50W O/P). Includes wideband Rx.

INCLUDES DTMF MIC **£475.00**

YAESU FT-7800E

2m/70cm + wide Rx. (50W/35W) includes DT, MF, mic.

BRAND NEW. LAST ONE

INCLUDES FREE IN-CAR KIT **£199.99**

YAESU FT-8900 R

10m + 6m + 2m + 70cm. (up to 50W).

INCLUDES FREE "DETATCH KIT". INCL'S DTMF MIC. **£359.99**

PSUs

WATSON PSU

Power-Mite NF 22amp..... £69.95
Power max (25A)..... £89.95
Power max (45)..... £115.00
Power max (65)..... £225.00
W-10AM 25A (linear)..... £59.95
W-25AM..... £89.99

DIAMOND GZV-4000

Includes built-in extention speaker

OUR PRICE **£169.99**

GZV-2500 25 amp version of above. Sale price £129.99

DIAMOND GSV-3000

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

OUR PRICE £169.99

NISSEI MS-1228

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

NISSEI HAVE BECOME RENOWNED FOR PUTTING QUALITY FIRST, YET MAINTAINING A GOOD PRICING STRUCTURE. A TRULY SUPERB POWER SUPPLY UNIT

'Smallest version to date' now with cigar socket.

QUALITY MADE PRODUCT **£89.99**

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear. Dim'ns: 256(W) x 135(H) x 280(D)mm.

30 AMP/12 VOLT PSU

A truly professionally made unit built to outlast most PSUs.

TRUE 'LINEAR' PSU

OUR PRICE **£149.99**

ANTENNAS

DIAMOND CP-6

A superb (diamond quality) 6 band trap vertical antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m (15ft tall).

SEND SAE FOR DATA SHEET **£309.99**

ATAS-120A

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

OUR PRICE **£269.99**

NEW INTRUDER III

13 band (80-10/6/2). PL-259 fitting. Includes WARC bands. 13 band version of Intruder II.

£49.99 (2 for £89.99)

INTRUDER II

11 band (80-10 6/2/70cm). PL-259 fitting. Colapses to 95cm (~ 3 ft).

£37.99 (2 for £70.00)

DIAMOND V-2000

6m + 2m + 70cm. 2 section (2.5m long) PL-259 fitting.

Superb quality

£124.99

ACCS

SGC BARGAINS

SGC MAC-200 New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it. (5 selectable outputs). **£289.99**

SGC-239 Mini tower ATU (1.8-30MHz) £199.99
SGC-237 HF+6m Tuner..... £309.99
SGC-230 (HF-200W) ATU..... £449.99
SGC-Smart lock (specify model)..... £69.99

MFJ-993B INTELLITUNER

Fully automatic (1.8-30MHz). 300W SSB.

Easy to use ATU. SALE PRICE **£239.99**

MFJ-949E

SALE PRICE **£174.99**

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

MFJ-259B ANALYSER

1.8-170MHz **£259.99**

Case 259B £29.99 Dip Coils 259/269£29.99

MFJ-269B ANALYSER

1.8-170MHz + 70cm **£339.99**

Case 269B £29.99

MFJ-269 pro version..... £369.99
MFJ-260C 300W dummy load..... £49.99
MFJ-264 1.5kW dummy load..... £79.99
MFJ-969 Rollercoaster ATU (300W)..... £199.99
MFJ-962D 1.5kW (metered) antenna tuner..... our price £269.99
MFJ-994B (600W) intelli tuner..... £319.99

GIZMOS

QUANSHENG TG-UV2

2m/70cm hand-held (SW O/P) VOX/CTCSS/DCS 200 channels. Dual watch. Incl's battery and drop in charger.

£79.99 P&P £5.00

ALINCO DJ-596E

2m + 70cm Handie. Includes nickle metal N.M.H.I and charger.

Includes free speaker mic

£139.99

KENWOOD TH-F7E

2m/70cm Tx. Rx: 0.1-1000MHz (AM/WFM/FM/SSB). Incl's battery pack (Lion) + charger.

Includes free speaker mic

£229.99

WOUXUN

2m/70cm mobile.

£phone

KG-UVPDI 2m/70cm handie .£89.99
KG-679E 2m..... £59.99
KG-679E 70cm..... £59.99
KG-699E 4m..... £89.99

ETON SATELLIT 750

0.1-30MHz SSB/AM 88-108MHz (FM stereo) 118-137MHz airband/rotary antenna. 1000 mems/ rotary tuning/wide-narrow filters & more.

+ FREE HD-1010 headphones

£299.99

WINRADIO EXCALIBUR

9kHZ-50MHz (all mode) receiver with spectrum analyser. Most manufacurers try to follow standards - WINRADIO sets them! WR-G3100C pack includes:- receiver + software + PSU + USB cable + BNC adapter. Requires PC.

ALL THIS FOR **£649.99**

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc.

Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £13.99 or 5 for £32.99 (P&P £4.00)

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling.
(Fits up to 2" mast) **£12.99** + P&P £4.50
30m pack (4.4mm) nylon guy rope £15.00
132m roll 4.4m nylon guy (480Kg b/f) ..... £45.00 Del £7.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£12.99 + P&P £4.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on WALL BRACKET £2.99 P&P £1.00

30m pack (4.4mm) nylon guy (480kg) £15.00
132m (4.4mm) nylon guy (480Kg) £45.00

HANGING PULLEY

Heavy duty die-cast hanging pulley. Hook and go!

£24.99

BARGAIN WINCH

500kg brake winch. BARGAIN PRICE

£89.99 Del £10.00

(Now includes cable grip)
Winch wall bracket £22.99

BUTTERNUT VERTICALS

HF-2V (80/40m) £279.99
HF-6V (80/40/30/20/15/10m) £375.00
HF-9V (as HF-6V + 17/12 & 6m) £425.00

TONNA YAGIS

220889 9ele 2m £79.99
220811 11ele 2m £109.99
220817 17 ele 2m £139.95
220818 9ele 2m XD £129.95
220921 21ele 70cm £109.00
2208938 9ele 70cm XD £135.99

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W) ..... £79.95 P&P £6.50
RS-102 1.8-150MHz (200W) ..... £49.95 P&P £6.50
RS-402 125-525MHz (200W) ..... £49.95 P&P £6.50
TM-3000 1.8-60MHz (3kW) Incls mod meter ..... £69.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR ..... £34.99 P&P £5
DL-30 diamond dummy load (100W max) ..... £29.99 P&P £5

HEAVY DUTY SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 5½ foot slot together.

£79.99 each. TWO FOR £135.99 DEL £15.00

NEW SWAGED MAST SETS

20 foot mast.
1½" – 4 x 5 foot sections.
(Swaged)
£49.99

20 foot mast.
1¼" – 4 x 5 foot sections.
(Swaged)
£46.99

H/DUTY CAR BOOT MAST SET

18 foot (1½" dia).
18 foot – 6 x 3 foot (1½") slot together ally sections.

£44.99 each. TWO FOR £79.99 DEL £13.00

NEW CAR BOOT MAST SET

Superb 18 foot (6 x 3 foot sections) that slot together.
Dia: 1¼" ideal to take anywhere. **£43.99**

2 for £74.99 del £13.00

LOW LOSS PATCH LEADS

£4.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£11.99
PL-259 - PL-259	1m	£14.99
PL-259 - PL-259	4m	£19.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£12.99

MT-3302

Heavy duty universal mount.
Includes 5m cable **£29.99**

MT-6601

Adjustable roof rack/window bar mount
£19.99

LIMITED STOCK

10m PNEUMATIC MAST

We have a small quantity of "military spec" pump-up masts (part of a Government order). All brand new in a crate and supplied with cover (close HT – 6 foot). Anodised green finish.
40m guy kit pack £49.99
Ground fixing spikes (3-off) £35.00
2 foot all ground fixing kit £99.99
(Can be hand operated or by compressor/foot pump)

10m MAST, ONLY **£1099.99**

NEW DIAMOND WD-330

Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else. Japanees quality made product WOW **£209.99**

W-8010 DIAMOND SHORTENED DIPOLE

80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.

£179.99

NEW DIAMOND BB6W

2-30MHz (250W) 6.4m long. End-fed wire antenna. Icludes matching balun. Sling up & away you go.

£199.99

CAROLINA WINDOM

CW-160S	(160-10m) 40m long	£149.95 P&P £10.00
CW-160	(160-10m) 80m long	£159.95 P&P £10.00
CW-80	(80-10m) 40m long	£129.99 P&P £10.00
CW-80S	(80-10m) 20m long	£149.99 P&P £10.00
CW-40	(40-10m) 20m long	£119.99 P&P £10.00
G5-RV	(80-10m) + balum	£74.99

CUSHCRAFT BARGAINS

Delivery £15.00

MA5B	Mini beam 10, 12, 15, 17, 20m	WOW £479.99
A4S	4 ele beam (10 - 20m)	£669.99
A3S	3 ele beam (10-20m)	WOW £575.99
R-8E	Vertical (40 - 6m) "special"	SPECIAL £499.99

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

SEND SAE FOR LEAFLET **£219.99**

NEW Wire Penetrator 50ft long (1.8-70MHz) £189.99

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end) ..... £34.99 P&P £4.00 (a pair)

TRAPS BACK IN STOCK

BALUNS & TRAPS (1kW)

Baluns 1:1 or 4:1 or 6:1 ..... £39.99 each P&P £4
Traps 80m or 40m or 20m or 15m ..... £39.99 pair P&P £5

GENUINE COAX SWITCHES

(P&P £6.00)

2 way CX-201 (0-1GHz) SO239 ..... £24.99
2 way CX-201 'N' (0-1GHz) 'N' £29.99
4 way CX-401 (0-500MHz) SO239 ..... £79.95
4 way CX-401 'N' (0-500MHz) 'N' £89.95

WATSON COAX SWITCHES

(POST £4.00)

CX-SW4N DC-1.5GHz (5xN) £59.99
CX-SW4PL DC-800MHz (5 x SO-239) £56.95
CX-SW3N DC-1.5GHz (4 x N) £49.95
CX-SW3PL DC-800MHz (4 x SO-239) £41.95
CX-SW2N DC-3GHz (3 x N) £32.95
CX-SW2PL DC-1GHz (3 x SO-239) £26.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF ..... £22.00 P&P £3
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) ..... £44.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) ..... £39.99 P&P £5
MH-31A8J 8 pin modular ..... £39.99 P&P £5

COAX BARGAINS

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

RG-213 Military spec x 100m (10mm dia).
£129.99/100m or 2 for £229.99

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

AR300XL

Quality rotator for VHF/UHF. Superb for most VHF-UHF Yagis, 3-core cable required. 3-core cable £1 per mtr. GS-050 stay bearing £34.99 OUR PRICE **£81.99**

DIAMOND YAGIS

No tuning required

2m/5 element	No tuning required	SO-239 feed £43.99
2m/10 element	No tuning required	SO-239 feed £79.99
70cms/10 element	No tuning required	SO-239 feed £49.99
70cms/15 element	No tuning required	SO-239 feed £64.99
6m/2 element	No tuning required	SO-239 feed £84.99

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

DUPLEXERS & TRIPLEXERS

MX-2000 50/144/430MHz Triplexer £69.99
TSA-6011 144/430/1200MHz Triplexer £64.99
MX-72 144/430MHz £34.99
MX-72 "N" 144/430 ..... £35.99
MX-62M (1.8-56MHz + 76-470MHz) £64.99

MOBILE ANTENNAS

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

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

EP-300

Over the ear earpiece.
£9.95
P&P £4.00

RH-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.

£54.99
P&P £5.00

STATION A4 LOG BOOK OFFER

3 FOR £10.00
P&P £4.50

EARPIECE/BOOM MIC

Over ear earpiece + boom mic. Available in Kenwood version or Yaesu/Alinco/Icom.

£24.99 P&P £4.00

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £12.00 P&P £4.00
12 for £20.00 P&P £5.00
30 for £40.00 P&P £10.00

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
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 £15.00
Roll of self-amalgamating tape 25mm x 10mtr £8.99
Special offer:- Self-amalgamating 3 rolls £20.00

All bracket measurements are from wall to end of bracket

The DX Engineering Hexx Beam (DXE-HEXX-5TAP-2)

The five-band two-element Hexx Beam works quite well despite its unconventional looks.

LIGHTWEIGHT BEAM. The quest for a small, lightweight HF multi-band beam goes on and on, but the five-band two-element Hexx Beam from DX Engineering in Ohio, USA, goes a long way to satisfying many of the criteria people want. This review is about the original model DXE-HEXX-5TAP we assembled, which has been replaced by the current model DXE-HEXX-5TAP-2. Differences are described in the text of this review.

This broadband design was optimised by Steve Hunt, G3TXQ, and offers full-size two-element performance on 20m, 17m, 15m, 12m and 10m in a package with a turning radius of just 11 feet.

G3TXQ's own website (http://www.karinya.net/g3txq/hexbeam) says that he first got interested in hexbeam designs after seeing them described on various websites, but he was puzzled by conflicting sets of published dimensions. He also heard some constructors were disappointed by the front-to-back performance they were getting.

He set about using computer modelling and building prototypes to understand the design a little better. The end result was the G3TXQ broadbanded hexbeam design that is now offered as a commercial antenna kit from DX Engineering.

HEXX BEAM KIT. The five-band DX Engineering HEXX BEAM, (currently adding 'Mark 2', to give it its full title) is a directional beam antenna kit made with fibreglass spreaders and wire elements. Once erected it looks like a large inverted umbrella frame. Even at 22 feet across and approximately four feet tall, it has a smaller turning radius than a two-element 20 metre Yagi. It is fed with a single 50Ω feedline and is designed to be used without an ATU.

Gain is specified as being approximately 5dBi (3dBd) on all five bands and the front-to-back can be greater than 20dB, depending on the band in use. Many users report front to back ratios of around 2 - 4 S-points in practice.

The wind load is approximately five square feet and the all-up weight is about 25lb (11kg). This means that it can be turned on small rotators and hoisted on fairly lightweight masts.

Other good selling points are that the HEXX reputedly performs well at low heights – at 20 to 30 feet above ground – and has no lossy traps. Its unique shape is also reported to receive less noise than typical beams. The light weight makes it a good choice for DXpeditions and hams looking for beam antenna performance in a relatively small package.

PUTTING IT TOGETHER. But how exactly is it built and how hard is it to put one together? Chris, G0DWV and I decided to build one in his back garden to find out.

We built the original DX Engineering version with the coaxial cable feeder sections. The present Mark 2 model has a balanced rigid feeder system made of stainless steel/Teflon that replaces the coaxial feeder jumpers found on the model we assembled. The new version offers several other improvements, as noted.

The Hexx Beam came in two boxes. The first one (five feet long) contains the grey fibreglass spreaders that hold the beam elements. The smaller box contains the hardware, including all the nuts, bolts, connectors and the Hexx Hub base plates. The full colour instructions are very comprehensive and the sealed bags with all the hardware are clearly marked. The Mark 2 version comes with a third box containing the preassembled and tested balanced rigid feeder system.

One note of caution, even if you don't like reading construction manuals, READ THIS ONE! This is not a five-minute affair and there are plenty of opportunities to mess things up if you don't follow the instructions to the letter, as is the case with any HF beam antenna.

To start, it helps if you can erect a tripod stand (not supplied) on which to build the antenna. This isn't essential, but will save your back.

STEP BY STEP. The first step is to fit the supplied fibreglass mounting centre post into the aluminium mast section and bolt this into place on the cast alloy Hexx Hub base plate.

Once that is done you can start to mount the three-section fibreglass spreaders into place using the supplied v-clamps. Worm drive clips hold each spreader to the next one and you then add the clips that hold the wire and nylon support cords, measuring their positions carefully as you go.

This is where our build got tedious, as we had to put together 30 element support clips and six cord support clips, which consist of a worm drive clip, washers and nuts. However, on the new Mark 2 version, these unique wire guides are preassembled and quickly installed.

Our only complaint was that the bolts used to fasten the sleeved centre post to the hub were only threaded along half their length and not as shown in the instructions. It turns out that this was a hardware packing error and was subsequently corrected.

You then cut the double-braided, UV protected, black polyester support cords to length and knot them to the ends of the spreaders and top centre post rope hub, stretching them upwards to give the antenna its characteristic upside-down umbrella shape.

To get this far took two of us about four hours and we found that you definitely don't want to do this on your own – you don't have enough hands to bend the spreaders into shape and tie off the cords before they spring back straight. Having other amateurs round for an 'antenna party' will also help with placement of fibreglass spreaders on the hub and postioning of all 30 element wire guides.

The front two fibreglass spreaders are then held in place with polyester cords between them.

WIRE AND CABLE. Once you have the basic frame set up you add the feedpoint assembly.

TABLE 1: SWR results at 14 feet (Note: SWR results are in each band with antenna properly installed at normal HF beam heights).

Resonant point(at 14ft)	SWR at bottom of band	SWR at top
13.950MHz	14.000MHz (1.2:1)	14.350MHz (2.75:1)
17.850MHz	18.068MHz (1.4:1)	18.168MHz (1.6:1)
20.623MHz	21.000MHz (2.40:1)	21.450MHz (3.2:1)
23.870MHz	24.890MHz (2:1)	24.990MHz (2:1)
28.018MHz	28.000MHz (1.6:1)	29.700MHz (2.4:1)

On our early model, it consisted of five points joined together with a short coax harness. The Mark 2 model now has a balanced rigid feeder system, which avoids any chance of water getting into the original coax harness if damaged. With the feed system in place on the centre post we started to cut the wire elements.

DX Engineering supplied a large quantity of wire that we laid out and cut to length – 15 pieces in total, five reflectors and 10 driven element sections. We both thought the wire should have been supplied on a reel as it took a good 10 minutes to untangle it as we fed it out onto the lawn. All of that is history, as the new Mark 2 model is supplied with pre-cut wire elements with the nylon tubes for the wire guide clamps, and the tags crimped onto every wire end.

Once we cut our elements, we found it best to solder a tag on one end before threading it onto the spreaders. Once in place we added the second solder tag. We couldn't do this beforehand, as the tags didn't fit through the nylon tubes on the wire guide clamps. We used a small butane torch to solder the tags – a small soldering iron might struggle when used outdoors. Once you thread the element wires through the wire guides, at this stage you can reposition the element clips and move them out on each spreader to 'tighten up' the whole antenna. The total time to get to this stage was about 5-6 hours. If we had the Mark 2 model, we would have been finished much sooner, as it is supplied with pre-cut and tagged element wires!

Once all the elements were in place, connected and evened up, we stood back and admired our handiwork.

INITIAL SWR READINGS. The instructions warn you to do your initial SWR readings at a height of no less than eight feet. We would agree with this as readings taken at the five feet build height showed the antenna to be resonant well below each band.

Raising the antenna to about 14 feet moved the resonant points up significantly. I would urge builders not to cut ANYTHING until you have tried the beam at its working height. We found that the lengths suggested were about right, but only once you had raised the beam.

The test results at 14 feet showed the beam to be usable across all bands, but with the resonant points quite low. We had no doubt that at height of 40 to 60 feet, these SWR curves would move up in frequency significantly.

If you do need to raise the frequencies of lowest SWR, the instructions suggest you only remove a quarter of an inch from the relevant driven element and half an inch from the reflector at a time. Greater amounts of pruning may be desired for your particular installation. Extra tags are supplied to reterminate the wire elements after pruning, if deemed necessary.

The final SWR measurements at 14 feet are shown in **Table 1** and as you can see it covers all of the five bands quite nicely. These were done with about 40ft of RG213 coax. The SWR readings were ultimately lower when the beam was hooked up to the main, 150-foot coax run.

It even covers the whole of 10m, up to the FM portion, which was gratifying.

UNDER TEST. Initial tests at the very low HF antenna test height of 14 feet showed the antenna to be lively, but down when compared with Chris's £2000 Force 12 C31XR beam at 60ft, as would be expected, although some times there was little in it.

To give the Hexx Beam a fair assessment, it was attached to the top of a 42-foot trailer-mounted Versatower in Chris' garden and hoisted up.

We then made comparisons with both Chris' Force 12 beam, which costs nearly four times as much as the Hexx Beam, and his doublet antenna.

In back to back tests with I0VII Pio near Rome on 20m the beam was two S-points down on the 3-elements of the Force 12, but significantly better than the doublet. The Hexx Beam is a very quiet antenna, which made listening much easier than on the doublet. The extra one S-point gain and lower noise made all the difference.

It was a similar story across the Atlantic with Harold, W2JWM in New Jersey and Jack W1FDY in Virginia on 20m – signal reports were down three S-points on the Force 12. (Angle of the signals due to height above ground is the likely reason for this result.) However, the contacts would not have been possible on the doublet at all as the signal strengths were down on that antenna and in the noise.

The quoted front-to-back and gain figures (see earlier) would appear to be about right. On 10m we pointed the beam south towards the C50C Gambia DXpedition and they were easily workable on the Hexx Beam, but inaudible on the doublet.

It was a similar story with 9L7NS in Sierra Leone (getting ready for CQWW). They were virtually inaudible on the doublet, but workable on the Hexx Beam with some difficulty on a patchy and wobbly 10m band.

CONCLUSIONS. In all then, the Hexx Beam is a well-engineered package offering modest gain and a good front-to-back ratio in a lightweight package. It doesn't need a monster tower or rotator to support it and we see no reason why it shouldn't be quite sturdy if built properly. It offers usable gain over a dipole and a good front to back ratio on all five bands. It is also a very quiet antenna. However, it is not a seven-element beam and neither does it pretend that it is.

We liked the overall design and features of the Hexx Beam, like the patented DX Engineering cast aluminium Hexx Hub. As with any HF beam antenna, what was apparent though is this isn't a five-minute assembly job. You must take your time and read the instructions carefully. It also pays to have some extra sets of hands around.

The Hexx Beam comes in two boxes. The smaller box contains the hardware, including all nuts and bolts, connectors and alloy mounting plates.

The first step is to fit the supplied fibreglass mounting centre post into the aluminium mast section and bolt this into place on the cast alloy HEXX plate.

The instructions warn you to do your initial SWR readings at a height of no less than eight feet.

Once all the elements are in place and connected up you can stand back and admire your handiwork.

Our thanks go to Martin Lynch and Sons for the loan of the antenna. The original DX Engineering Hexx Beam was priced at £599.95. They are now selling the Mark 2 version, model DXE-HEXX-5TAP-2, with all of the major improvements described here.

The survey of plasma television interference

A report on the findings

Can large screen plasma TVs live happily alongside amateur radio?

SETTING THE SCENE. Last year, the International Special Committee on Radio Interference (CISPR) sought the help of National Standards Committees around the world in determining the extent of the problem caused by radiated interference from large screen plasma TV receivers. This was the actual request:

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE (CISPR) SUB-COMMITTEE I: ELECTROMAGNETIC COMPATIBILITY OF INFORMATION TECHNOLOGY EQUIPMENT, MULTIMEDIA EQUIPMENT AND RECEIVERS

RADIATED INTERFERENCE FROM LARGE PLASMA TVS

CISPR I WG1 is currently looking into a number of reported cases of radiated interference below 30MHz from large size Plasma TVs. A special task force is investigating this issue. Based on the results reported during our last annual meeting held in Lyon France in October 2009, CISPR I decided to issue this DC seeking guidance from the National Committees on the extent of the problem. The way forward very much depends on the balance between the number of reported interference cases and the effort for mitigating/testing the radiated emissions below 30MHz, taking into account the fact that the Plasma technology is being replaced by LCD, a technology with inherently lower emissions.

As a result National Committees are kindly requested to provide CISPR I WG1 with updated data on reported cases of interference from large plasma TV sets by 3 September 2010 to allow discussion at the CISPR/I meeting in Seattle in October 2010.

In the UK, the relevant National Committee is a BSI committee known as GEL210/11. The response to the request for help came initially from Ofcom in the form of a short report confirming the number of cases that they had on record. The Ofcom report was that 12-15 cases were recorded. As a member of the committee I was surprised, even alarmed, that the number of reported cases was so low. It did not tally with other inputs that I had as a member of the EMC Committee.

SOME BACKGROUND. The standard used to assess the Electromagnetic Compatibility of domestic appliances is CISPR 22 (in Europe this same standard is adopted as EN55022:2006). At frequencies below 30MHz, emissions from appliances are assessed by measuring the leakage currents present on the mains cable and any other attached cables. In the case of a TV receiver, this is the coaxial connection to the antenna. The standard does not attempt to make true radiated measurements.

There are some very good – and long standing – reasons for this methodology. Attempts at making radiated measurements below 30MHz incur large uncertainties, which may be as great as 10dB, and will depend on the test environment. An indoor site (screened room) may result in less uncertainty, but is expensive, whilst an outdoor site is subject to extraneous HF signal inputs. Over the years the conducted emissions tests have proved generally acceptable and reliable, especially for domestic goods and test instruments etc.

However, large plasma TV receivers present a situation not encountered until their introduction several years ago, except perhaps on industrial equipment. Generally, when we refer to large plasma TVs it is the 50inch or larger units that are in focus (although interference effects have been recorded for smaller units). The reason for this is that these units are an appreciable part of a wavelength below 30MHz. Furthermore, the radiation that takes place is generated over the full width of the display. Additionally the nature of a plasma display is inherently more susceptible to radiate. They have been described as 'a million spark transmitters working in parallel'.

This leaves manufacturers with a challenge – to reduce radiation as far as possible and to set up their own assessment procedures. Some have done very well in reducing the problem. Perhaps the most fortunate part of the saga is that plasma TVs are 'on their way out', with only one large manufacturer now assembling them in Europe.

It is worth noting that large plasma TV displays were originally produced for presentation use, not domestic use and were often declared to the industrial part of CISPR22. While this can still be done, the revised EMC Directive makes it mandatory now for manufacturers to provide a written warning that they are not suitable for domestic use.

RSGB REACTION AND SURVEY. In July and August 2010, RSGB members were asked to report on cases of interference from plasma TV receivers. Here is a summary of the findings of the survey of RSGB members.

Over 140 instances of complaint have been logged that could be specifically associated with a plasma TV. All of the complaints have been scrutinised for accuracy and many inputs were discarded as not having sufficiently well identified plasma TV as the culprit. There were over 220 inputs received and of these 22 recorded no specific evidence of interference from plasma. The remainder (58) were regrettably vague regarding the source of interference, and the source could have been a SMPSU.

The information provided by RSGB members and some background information reveals why there is a large difference between this survey and the records provided by Ofcom. Some of these reasons are as follows:

- First, Ofcom procedures require that they only record complaints that they actually investigated.
- Ofcom have records from the beginning of their online system, covering a period of about two years. Some RSGB members reported cases from several years before that. The survey revealed that 25 complaints had been made to Ofcom.
- Many RSGB members commented that they did not wish to upset neighbours and felt unable to complain formally. This occurs in a significant number of cases.
- Others did not complain because they were not prepared to pay the fee of £50 for Ofcom to investigate. (Whether the charging of a fee was applicable was not questioned).
- Members did not complain because they felt that Ofcom would do nothing. A significant number (~7%) of members made this comment.
- The survey revealed that most (if not all) of the complaints investigated by Ofcom came from radio enthusiasts.

CONCLUSIONS. The membership of the Society represents 0.5% of the UK population, widely distributed throughout the community. Taking the population of the UK as a whole, it would be reasonable to expect a much higher incidence of complaint. However, radio amateurs are not only enthusiastic users of the HF bands and are trained in radio practice, they may also have access to equipment needed to track down a source of interference. Less knowledgeable listeners would not have the means to diagnose the cause nor source of interference. Radio amateurs have been described as being like canaries in the coalmine – very apt in the circumstances.

A review of the details of the complaints reveals that interference occurs over distances of several hundred metres, which means that some reports have included several separate incidences, each separately identified.

About 16% of the cases reported result from a plasma TV purchased by a radio amateur. In some of these cases the owner has worked to mitigate the interference. These measures include re-orientation of the TV and/or the amateur radio receiving antennas, fitting of filters on the mains lead and coaxial cable. The reports show that none of these approaches have been entirely successful.

Our survey reveals that some manufacturers have been proactive in repairing or replacing TV units that have caused interference. In the case of newly purchased units the owners have been offered an exchange, although this has not proved to be 100% successful, except where changed for an LED model. In older units some remedial work has been undertaken, but unfortunately no information has been presented on the work done.

The results of the survey do not differentiate between the TVs that displayed interference symptoms when first used from those that cause interference when they start to age, but it is worth noting that there is this difference. It is quite possible that a new TV meets CISPR22, but ageing has taken them over the specification limits. A new TV placed on the market would be subject to the EMC Regulations, but Ofcom have no mechanism for handling interference from older ones. They could use conditions cited in the TV licence condition, but they deny that they can do so! Indeed, Ofcom has stated they can do nothing about this interference and quite clearly this is one reason why people no longer complain.

FINAL WORD. If you suffer from interference – COMPLAIN! A word of caution is needed at this point – the analysis of the plasma TV complaints reveals an alarmingly high number of cases where the interference was self-inflicted. In fact, well over 25% of the cases recorded were for the members own plasma TV. Is this a reason for not making a complaint? Certainly not!

You should still make a complaint to Ofcom, making it clear on the telephone or website entry that you are not expecting any action to resolve the problem, but you wish to make it clear that there is an EMC issue. I am assured by Ofcom that this is an acceptable approach. You will not be charged.

Even when the plasma TV or SMPSU is next door, and there is an inclination to not upset your neighbour, use the Ofcom complaints recording system, simply making it clear that you are not requesting follow-up action. In any case, Ofcom are bound to respect your anonymity. You will not be charged if the source of interference is outside of your home.

If you do not complain, Ofcom will do nothing, the EU Commissioners will continue to ignore us, the Standards makers will not know of the problem and your Society has no recourse to action – it is up to you. Do your homework, determine if possible the source of interference, eliminate you own home. Then, take the necessary action to save our hobby. Complain; don't let complacency kill our hobby!

If you do not speak up, Ofcom will be fully justified in their assertion that there have been few complaints. *Don't* let this happen.

THANK YOU! Thank you to all of the members who responded to the survey, in some cases with detailed reports on their findings and measures at mitigating the problems. Your help was much appreciated!

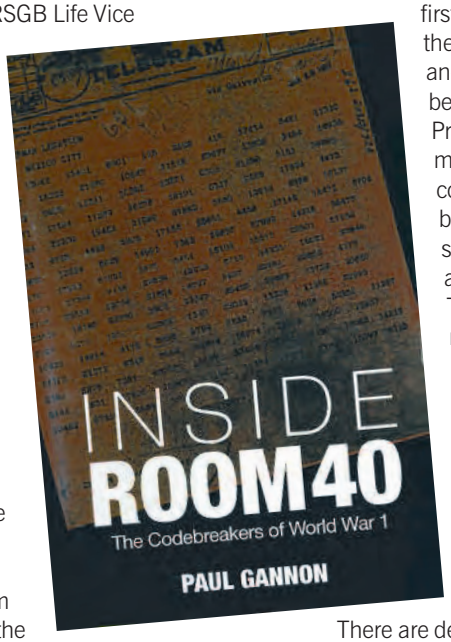
Book review

Codebreakers, scrapped aircraft, DXing and radio astronomy

INSIDE ROOM 40 – The Code breakers of World War I

By Paul Gannon

Inside Room 40 is a very surprising book, not only was it surprising to find the First World War activities of two RSGB Life Vice Presidents and a President noted but also the extent of the code breaking in WW1 and that the efforts of Room 40 are credited with bringing the USA into the war in 1918.



From the very earliest days of WWI Britain was breaking the German Naval codes and Inside Room 40 paints a graphic picture of the activity that took place here, throughout the war. Radio was a relatively new medium of communication at the onset of the 1914-18 war and one of the Government's first acts was to make it an offence to have either transmitting or receiving equipment. This did not though stop those first radio amateurs making their presence felt. R Clarke and B Hippisley (later to become RSGB Life Vice Presidents) became a major part of the British code breaking effort by setting up a highly sensitive receiving station at Hunstanton in Norfolk. This book though is much more than that single aspect of the code breaking activity. You will find the impact made by the deciphering of German messages on the Battle of Jutland (a story that portrays a later RSGB President in a rather unflattering light).

There are detailed explanations of the methods used to crack the German codes and descriptions on how the information was used to guide British wartime activity. There is a long section devoted to the 'Zimmermann' telegram, which was cracked by the British code breakers. This telegram was released to the Americans by the British and is credited with pushing the USA into the war on allied side. The Germans were so surprised at its release that rather than believe it had been decoded they believed their organisation contained a spy who had passed it on.

This book was certainly surprising to me, that the efforts of the British WWI code breakers was *so* extensive and the influence they had. Being more familiar with the Bletchley Park activity, I was also surprised to learn how many been drafted to work the there following their WWI activity. If you are interested in code breaking or even how this story fits into later history this is a fascinating book.

Hardback
294 pages, 157 x 237mm
ISBN 9780-7110-3408-2
Non Members £19.99
RSGB Members £14.99 (25% off)

TSR2 – Britain's Lost Cold War Strike Aircraft

By Tim McLelland

I experienced a very strong sense of déjà vu while watching the news the other day. I saw footage of new and part-built Nimrod aircraft being broken up for scrap. History is littered with what-might-have-beens and the TSR2 aircraft is another of them. Its roles were to have been Tactical, Strike and Reconnaissance – hence TSR – but, due mainly to spiralling costs, the programme was axed after just 24 prototype flights. In that respect it did better than the Nimrod, which was flight-ready but had never left a runway.

There is something rather romantic about the TSR2's appearance. Its clean, flowing lines looked fantastic, particularly when seen against the dumpy 1950s support vehicles on the tarmac. It had cutting-edge technology – better than anything else around – and phenomenal performance such as a top speed of Mach 2.25 and a sea-level climb rate of 50,000 feet per minute. That's over 550mph straight up. Anyone who understands aviation will recognise that this would be quite an achievement today, let alone over 50 years ago.

Tim McLelland has done a remarkable job pulling together information from a diverse range of sources into quite a readable, fact-laden story. He has managed to obtain a fantastic range of photos, too, including a number of rare colour images. (Remember that affordable colour photography was still in its relative infancy when the TSR2 project was under way.) There are post-flight crew interviews, beautiful scale drawings, engineering details of how new techniques were developed so that various parts could be made – the list goes on and on.

Whatever your interest in aviation in general or the TSR2 in particular, this is a comprehensive, lavishly illustrated work that deserves space on your bookshelf.

Hardback
ISBN 978-1-906537-19-7
128 pages, 233 x 310mm approx
Non members' price £19.99
Members' price £14.99 (25% off)

Amateur Radio Astronomy Second Edition

By John Fielding, ZS5JF

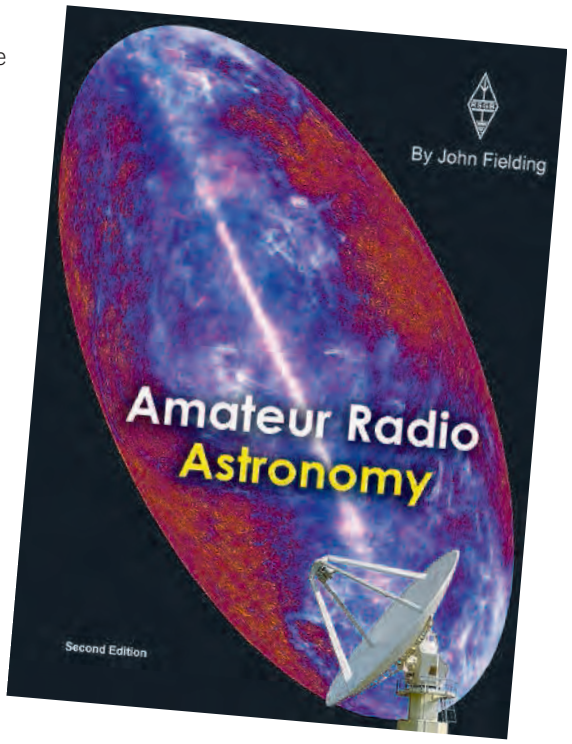
I've always thought of radio astronomy as being the sort of pursuit that can only be achieved with massive investment in huge dish aerials. Say 'radio astronomy' and the next thing that enters my head is Jodrell Bank. But it hasn't always been like that; indeed, some of the pioneers of this relatively young science were enthusiastic amateurs armed with relatively simple equipment.

The book starts with a comprehensive history of radio astronomy from its earliest days in the 1930s. At that time strange interference was noticed on HF ship-to-shore links – the stranger still because it repeated on a regular schedule nearly, but not quite, every 24 hours. Eventually it was realised that the repeats happened every sidereal (astronomical) day – the signals came from space…

This book describes all the important improvements in the technology, including the iconic Jodrell Bank.

How about setting up your own radio telescope? Fielding explains that you just need an antenna, low noise amplifier, feeder, a receiver and some means of permanently recording the signals. He then goes on to describe, in detail, how to make various different systems for yourself. They range from recycled satellite TV parts through to an active meteor radar. How about listening to the noise storms on Jupiter? Easily achieved with quite simple equipment that you may already possess. For the more adventurous, there are even plans for a hydrogen line (1420MHz) receiver.

This book is jam-packed with fascinating information. It has been revised and updated and has over 60 pages more than the first edition. No-one that reads this book will ever look at the sky in quite the same way again.



Published by RSGB
ISBN 9781-9050-8667-2
384 pages, 174 x 240mm
Non members' price £16.99
Members' price £14.44

Low Band DXing, 5th edition

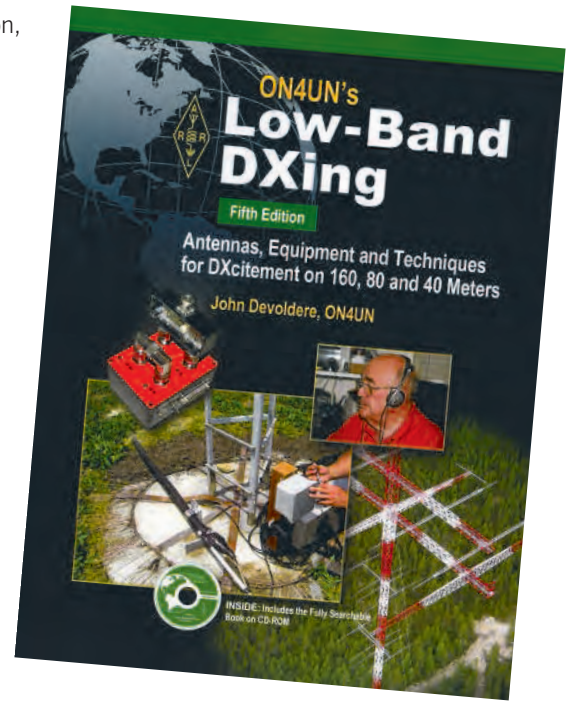
By John Devoldere, ON4UN

My first reaction to this ARRL book was one of surprise: it covers the 40, 80 and 160m bands, whereas I was expecting it to start at 136kHz and maybe go as high as Top Band. I know that this is the 5th edition of a much-loved book and I'm not aware of 136kHz or 500kHz allocation in the USA – but there is surely plenty of cross-band DX activity that can be chased. Perhaps the next edition will rectify this omission.

But now the good news. This is an incredibly comprehensive book that tells you everything you need to know about DXing on the 40, 80 and 160m bands. Since the first edition some 25 years ago it has been constantly updated and continues to reflect the state of the art.

Starting with a detailed look at propagation, we are guided through the equipment you need, antennas – including receive-only antennas and even Yagis, feedlines, working from a small garden and even low band contesting. In a short review I can't begin to give an accurate view on the sheer breadth and depth of coverage other than to make small observations. The Propagation section, for instance, breaks the subject into 7 subject areas; the influence of the Sun is considered in four sub-sections (sunspot cycle, 27-day cycle, seasonal cycle and the daily cycle). All of these of course affect, in different ways, what you will and won't be able to work. The chapters on antennas total nearly an inch thick, according to my ruler!

As an added bonus, there is a CD at the back of the book that not only contains the full text but also contains photos, software and supplemental material such as EZNEC files for many of the models referred to in the text. Whether or not you consider 40, 80 and 160m to be 'low' bands, there is no doubt that this is a magnificent reference manual for these bands and is well worth considering.



Published by ARRL
ISBN 978-0-87259-856-0
672 pages, 208 x 276mm
Non members' price £34.99
Members' price £29.74

If you haven't already tried the RSGB Bookshop online at www.rsgbshop.org then you may be missing out. The online book shop contains a vast array of publications on amateur radio and you'll sometimes find special offers that don't always appear in the printed version of *RadCom*. You'll discover full details of other special RSGB items such as callsign badges, clothing and members' offers.

Sport Radio

How the format for a contest can encourage people to join the RSGB, and travelling abroad for the Commonwealth Contest

PHOTO 1: 5X1NH (G3RWF) in his shack in Uganda. Note the custom-built racking, made from bricks.

RECIPE FOR SUCCESS, PART 3. In the final part of the story that charts Bolton Wireless Club's success in the UKACs, Ross Wilkinson, G6GVI, tells us what he thinks is the key to the overall success of the contest series.

"We consider the actual format and organisation of these Club Championship events are key reasons for our success: the fact that every member's score (no matter how small) counts towards the total; G4CLA's excellent web-based entry system that makes it easy for everyone with a PC and web browser to submit their own logs; the rapid turn-around of adjudication and publication of results, so that we can see our position in the table before the next session on each band; and the regular return to each band on a monthly basis, which gives us time to make improvements in our systems and then monitor the change over the course of the year. We'd like to congratulate the Contest Committee on coming up with a winning formula and hope to find more clubs taking up the challenge during the coming years.

"Looking at the bigger picture, we're pleased to say that a number of our BWC members have found that they enjoy VHF contesting so much that they've now become RSGB members, so that they can enter more of the (non-AFS) events. Indeed, one of our number (who took his Foundation and Intermediate exams with us over the last year) has already won several certificates as the leading Intermediate station in events last summer. We've also heard comments that the intense activity in IO83 square has resulted in stations in the South beaming North much more often, and so helping all stations in Northern England and GM to make more contacts than was possible in previous years."

I'd like to congratulate BWC on a job well done, because they did indeed win the 2010 UKACs. Without being the least bit malicious, I hope their article inspires other clubs to give them a run for their money. Personally, I see teamwork as an under-rated ingredient to success in team contests, because the most successful contest teams always contain a variety of people. When it comes to portable operation, where would the operators in a 24-hour event be without someone to make coffee and keep them fed? In the UKACs, where would a team be if there were lots of operators in a club but nobody with any knowledge about tactics? Someone I know summed this up well, saying; "In Formula 1, not everyone gets to drive the car".

COMMONWEALTH CONTEST. Mounting small-scale DXpeditions to activate some of the Commonwealth countries you don't hear every day is a well-established practice for the Commonwealth Contest. One person who has travelled more than once to Uganda is Nick Henwood, G3RWF, who operates 5X1NH (**Photo 1**) from the university lodge that is his accommodation when he visits the country. He tells us of his exploits there last year.

"I arrived in Fort Portal nearly two months before the Commonwealth Contest. I go there to do *pro bono* work in a community university and my extensive time on the air is 'out of hours'. 2010 was my third year, so I know the challenges. I had solar power available for the contest but (amazingly) I also had mains (hydro) power throughout. My usual antenna for Uganda is an inverted-V dipole with links for each band. In BERU that means a trip outside every time I need to change band, which is particularly unhelpful in the middle of the night, but last year I took an HF2V vertical for 40/80m and that certainly helped. I also added a 'nested' three-band dipole for 10, 15 and 20m. I made it in the UK, but when I got it there it appeared to be resonant about 1MHz low on each band! I did some local redesigning using the thinnest (top) section of my two fishing rod masts as spacers and very soon managed to get it resonant on each band (see **Photo 2**). Finally, there is the low band problem. Static is terrible in Uganda during March, as the rains and thunder have started. I tried hard to improve signals, by adding 18 radials and some top loading for 80m. It was better, but static is just a matter of luck.

"I had some serious trauma before the contest when, despite being very careful, my laptop got a nasty dose of viruses. I had to use a separate operating system to recover my logging system (although I'd backed up) and reloaded virtually all my software from the Internet (including SD). The download speed there is usually about 4kbps (yes, seriously).

"Foolishly, I decided on a last minute SWR adjustment of a 15m dipole. The 10ft section of plastic water pipe 'mast' decided that it was so hot it would bend like a banana, but I managed to prop it up and then splint it. It worked OK but looked ugly and put me in a panic for the start.

"15m was a good band for me, as it performed well throughout the contest. 40m was also good, but with night-time static of course. 20m remained stubbornly noisy throughout – there was a sort of roaring, frequency-sweeping noise around for the whole contest. I have heard it many times before in Africa and just have to dodge around it. 80m was, well, 80m. I made 19 QSOs between the crashes, which is better than last year but a poor reward for a lot of effort. Finally 10m, for which 'capricious' would be the best description. It never really got going, although I did lots of listening and calling. It would come to life for just a few minutes and then go back to sleep. Propagation was also strange. It seemed very difficult to work Canada and I just heard nothing from the Caribbean, but Australia was fine… and so was Russia!

"Overall, I had a great time. During the contest there's time for a few words more than 599 and only two stations gave me a real report. Thanks guys – I hate having to play around with the logging program!"

Commonwealth Contest travellers to look out for this year include the following:

- Dave Goodwin, VO1AU, will be operating from a well-equipped rent-a-shack in East Malaysia as 9M6/VO1AU, not only in the Commonwealth Contest, but also the ARRL DX SSB Contest the weekend before.
- Richard Limebear, G3RWL, will be operating as 8P6DR in a holiday-style DXpedition to Barbados, using a K2 and wire antennas.
- Alan Ibbetson, G3XAQ, is expecting to be active again from Ghana. No callsign was available at the time of writing.
- Peter Day, G3PHO, had his trip to the

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Mar 7	80m Club Championships	2000-2130	Data	3.5	RST + SN
* Mar 12-13	Commonwealth Contest	1000-1000	CW	3.5-28	RST + SN (HQ stations also send "HQ")
Mar 16	80m Club Championships	2000-2130	CW	3.5	RST + SN
Mar 24	80m Club Championships	2000-2130	SSB	3.5	RS + SN

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Mar 1	144MHz UKAC	2000-2230	All	144	RS(T) + SN + Locator
* Mar 5-6	144/432MHz	1400-1400	All	144/432	RS(T) + SN + Locator
Mar 8	432MHz UKAC	2000-2230	All	432	RS(T) + SN + Locator
Mar 13	70MHz Cumulative #2	1000-1200	All	70	RS(T) + SN + Locator
Mar 16	1.3GHz UKAC	2000-2230	All	1.3	RS(T) + SN + Locator
Mar 22	50MHz UKAC	2000-2230	All	50	RS(T) + SN + Locator
Mar 22	SHF UKAC	2000-2230	All	2.3-10G	RS(T) + SN + Locator
Mar 29	70MHz UKAC	1900-2130	All	70	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange (info)
Mar 5-6	ARRL International DX	0000-2359	SSB	1.8-28	RS + tx power (Ws send State, VEs Province)
* Mar 19-21	BARTG HF RTTY Contest	0200-0200	RTTY	3.5-28	RST + SN + time
Mar 19-20	Russian DX	1200-1200	CW, SSB	1.8-28	RS(T) + SN (Russians send Oblast code)
Mar 26-27	CQWW WPX SSB	0000-2359	SSB	1.8-28	RS + SN

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

British Virgin Islands planned and booked many months in advance of the contest. Listen for VP2V/G3PHO.

- Bob Whelan, G3PJT, will be active from St Lucia as J6/G3PJT for a whole week around the time of the Commonwealth Contest, using a K3 and vertical antennas.
- From St Vincent, Dave Cree, G3TBK, will be active as usual as J88DR.
- Frequent DXpeditioner Nigel Cawthorne, G3TXF, will be operational from Montserrat as VP2MXF.
- Nick Henwood, G3RWF will be returning to Uganda in time to be 5X1NH again. Apparently he has started praying for gaps in the low band static, 24 hour mains power and propagation on 10m.

PHOTO 2: Two of the antennas at 5X1NH. In the foreground, nested dipoles for the HF bands, and in the background a dipole with removable links that can be set for any band.

THIS MONTH'S EVENTS. On HF it's the third month of the 80m Club Championships, with data on the 7th, CW on the 16th and SSB on the 24th. The only other RSGB HF event this month is the Commonwealth Contest, which takes place for 24 hours on 12-13th. This is a contest that only takes place between Commonwealth countries, so it is largely free of Continental European stations. Infrequently activated countries always appear in this contest (as you may have read above) and without the mega pile-ups that occur in many other worldwide contests, the owner of a modest station in Britain stands a decent chance of working some real DX. Be aware though that some DX openings are very short, so it helps to know when to look for particular areas, especially on the upper HF bands.

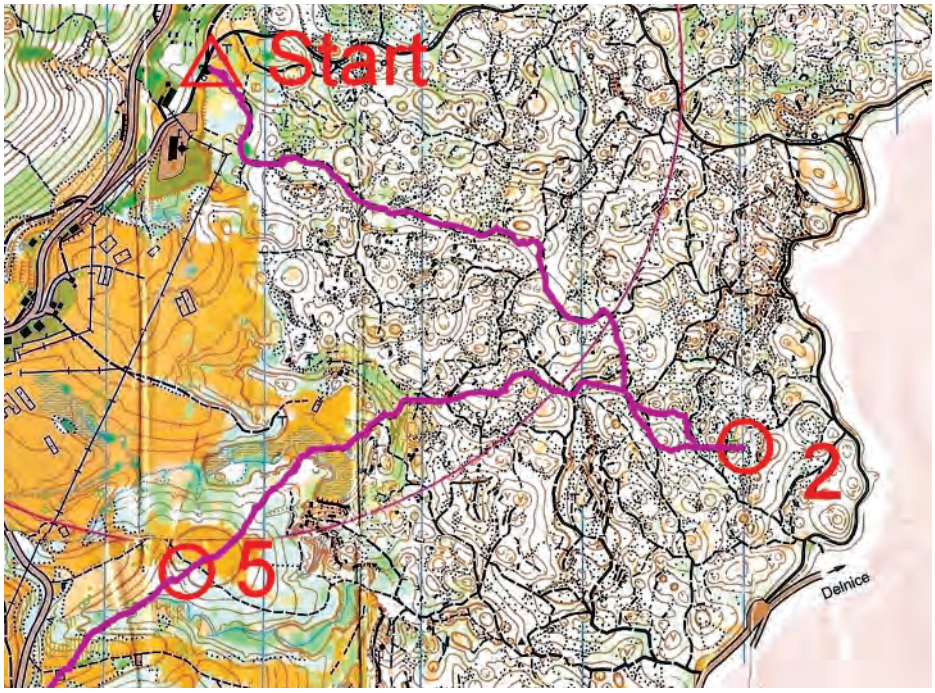
On VHF, the 2m UKAC takes place on the 1st. On the weekend of 5-6th the 144/432MHz contest has 6-and 24-hour categories. It's one of the earliest contests of the year in which a few hardy souls or groups are likely to brave the elements and operate portable for 24 hours. After that we return to the UKACs, with 70cm on the 8th, then on to the second 70MHz Cumulative on the 13th. There will be three further cumulative sessions in the coming months. For the remainder of March the UKACs dominate, with 23cm on the 16th, 6m and SHF on the 22nd. Finally, because it's a five-week month, there's a 4m UKAC on the 29th.

Major international events begin with the ARRL DX SSB Contest on 5-6th. The CW leg took place last month, so please see February's column for more information. Following that we have the BARTG HF RTTY Contest, which runs for 48 hours starting 0200 on the 19th. Single operator stations can make a 6-hour all-band or 30-hour single-band or all-band entry, while multi-op stations can be single transmitter or multi transmitter, but only enter the full 48-hours. There are no differing categories for different power levels. The Russian DX Contest takes place for 24 hours over the same weekend. This is a CW/SSB event, which includes the interesting possibility of submitting two single-band entries, e.g. 10m and 80m. Work everyone and send a signal report and serial number, but expect Russian stations to send you a signal report and a 2-letter Oblast code. The final event of the month, on 27-28th, is the SSB leg of CQWW WPX. The RTTY leg took place last month, so please see February's column for more information.

ARDF

GPS route logging for ARDF

YOUR RSGB
ARDF: DEDICATED TO DF HUNTING



The route taken by the author on the 3.5MHz day at the 2010 ARDF World Championships. The track shows how he found his way from the start to the first two transmitters he was assigned.

ROUTE TRACKING. In amateur radio direction finding (ARDF), the objective is to visit a number of low powered transmitters, in any order but as quickly as possible. The competitor is issued with a map, showing only the Start and Finish locations. Hence the essential radio skill is to determine the locations of the controls using direction finding techniques. The rules forbid the use of any GPS device that might confer a competitive advantage, but in practice the benefits would be quite small, limited to screen displays of distance/route travelled and altitude. This is principally because there is no co-ordinate grid printed on the competition maps. However, a device that merely records a log of location co-ordinates and time in a form to be downloaded after the event can be very useful as a training aid (and, the author must admit to his embarrassment, reveal afterwards where the competitor actually went!).

There are several GPS route loggers on the market. Their ability to receive satellites and maintain a track faithfully under a tree canopy has improved markedly in recent years. Some are feature rich, combining watch displays and heart rate monitors – with prices to match. In general, the more elaborate models are unacceptable under competition rules. However, several simple data loggers are now available and the author's attention was attracted to the Ventus G730 when it was promoted in the December 2009 *RadCom* at the special price of £44.95. It has since become a standard piece of my kit at ARDF events, either on a cord round my neck or in a small bag together with spare batteries and headphones. Carried in this way, it can faithfully record progress in most situations, although it suffers from the expected weakness of losing track of the satellites when moving through dense forest vegetation.

It is very simple to record a track in competition. It is only necessary to push a slider to switch it on, ideally in the Start area a few minutes before setting off. This avoids the risk of forgetting to do so in the stressful situation of actually starting! It also allows a short time for it to lock on to the satellites: a blue flashing LED indicates when this has been achieved. There is a button which can be pressed to record specific locations, such as the transmitters found, if desired – though the author generally finds that there are too many other things to think about and this function is ignored. The most difficult thing to remember is actually switching off in the excitement of the finish. After this, it remains only to download the track into a computer.

The software supplied with the Ventus logger comes on a CD and is quite straightforward to use. The unit plugs into a USB connector; on-screen instructions easily enable the data to be downloaded and stored in the computer. The track can then be displayed, either on its own, or superimposed on Google road or satellite maps – this is a standard feature of the software supplied. The unit recharges itself from the USB port whilst it remains connected and a small green LED indicates that this is taking place. Finally, once the data are safely stored, the memory in the unit should be cleared, ready for the next event, and the battery charging completed.

There are various supplementary programs that can be used in conjunction with the logger, in order to produce a track on the actual competition map – which is more useful than just using the Google map. This is achieved by exporting a file in .gpx format (another feature of the Ventus software) and saving it in the computer. Some adjustment is usually required to eliminate a spurious 'lead-in' track at the beginning, while the satellites were being captured; there is also often a 'tail' where the competitor forgot to switch off at the finish. This can be done by opening the .gpx file in *Notepad* and deleting the unwanted data, identified by their time records, which appear in plain text. There is also a facility in the Ventus software for editing the track directly, if preferred.

I use a program called *QuickRoute*. The track illustrated here, showing the route taken from the start to the first two transmitters (numbers 2 and 5) in the 3.5MHz event at the 2010 World Championships, in Croatia, is derived from *QuickRoute*, but has been enhanced for clarity. There are various options for adjusting the appearance of the track, such as the use of colour graduations to indicate speed – typically green for fast and red for slow. This program is quite simple to use; it just asks for a scan of the map (.jpg) and the track record (.gpx) and a certain amount of adjustment to superimpose the two correctly.

Examination of the track can be very beneficial as a training aid by helping to identify mistakes in navigation and tactics, and it is also useful for analysing strategy and comparing routes in discussion with other competitors.

REFERENCES

www.matstroeng.se/quickroute/en/
www.ventusdesign.com/products/g730-ventus-gps-logger/

The Ventus G730 GPS Route Logger, available from Martin Lynch & Sons.

T32C from Christmas Island

Kiritimati, or Christmas Island, is a Pacific Ocean atoll in the northern Line Islands.

T32C. In October 2010, the Five Star DXers Association (FSDXA) announced its fifth major DXpedition, this time to Christmas Island in the heart of the Pacific Ocean. This will be a big DXpedition, with a target of more than 150,000 QSOs. There will be up to 15 stations active around the clock that should give many DXers worldwide the chance to make at least one contact with this remote DXCC entity, however modest their station, while at the same time allowing more serious DXers the opportunity to complete new band-slots. The team will attempt to contact 40,000 unique stations. In the case of stations in the UK they will attempt to contact between 1,000 and 2,000 unique stations, a major challenge from the Pacific.

WHY KIRITIMATI? Club Log shows Eastern Kiribati (Kiritimati), T32, as 36th most wanted DXCC entity by European operators and 61st most wanted worldwide. It is even more sought after on the LF bands. Kiritimati, or Christmas Island, is a Pacific Ocean atoll in the northern Line Islands and is part of the Republic of Kiribati. It should not be confused with an island of the same name (VK9/X) in the Indian Ocean. This Christmas Island lies 232km north of the Equator and 6,700km from Sydney. It is in the world's farthest forward time zone, UTC + 14, and Christmas Island is the first inhabited place on Earth to experience New Year each year.

The entire island is a wildlife sanctuary and access to five particularly sensitive areas is restricted. The island is perhaps best known for the nuclear tests conducted in the surrounding region by the United Kingdom in the late 1950s and by the United States in 1962. During these tests islanders were not evacuated. The island's runway has been kept in good repair as a back-up for the space shuttle.

EQUIPMENT AND SHIPPING. UK-based members of T32C have had several preparatory sessions to clean up and refurbish kit from previous operations as well as building and testing equipment that they will be using for the first time (for example, new 4-square antennas for both 40 and 30m and vertical arrays for the high bands, complementing the existing Yagis). Some photos of these activities appear on the website [1]. They have also been getting to know the FT-5000 radios – there will be 16 of these radios on T32, along with Quadra linear amplifiers. Several pallets of gear are now ready to be transferred to the shipping container, which they expect to leave the UK in late February. From here it will travel via Singapore to Fiji, arriving in Suva in April or early May, for onward shipping to T32. A novel development will be the inclusion of a GPS tracker in the container so that they can follow the progress of the kit as it makes its way to the island!

The T32C DXpedition is planning to have up to 15 stations on air. There will be a station on every band from 160m to 6m with second stations on 80m, 40m and 20m plus other bands where technically feasible. This is so that they can operate on CW and SSB at the same time. Yaesu will be providing the RF equipment, the newly-launched FT-5000 transceivers and the well-proven VL-1000 linear amplifiers.

The antennas planned are:

160m: Titanex with top loading
80m: Two pairs of phased verticals
40m: Two four-square arrays
30m: Four-square array and single vertical
20m: One 3 element Yagi and one Vertical Dipole Array (vertical dipole, with parasitic reflector)
17m: One 4 element Yagi and one special 4-element broadside VDA
15m: One 4 element Yagi and one VDA
12m: One 4 element Yagi and one VDA
10m: One 6 element Yagi, one 3 element Yagi and one VDA
6m: 7 element Yagi with EME capability

THE TEAM. A large number of amateurs from 13 different DXCC entities have already signed up for T32C, some for half the overall period, some for the whole operation. There will be 30 operators on site at any one time. Operator numbers have been determined to ensure that a full complement of stations can be manned whenever bands are open. Many of these operators have been on FSDXA DXpeditions before and full details can be found on the website.

WEBSITE. The T32 website [1] is up and running and shows all the latest news. For example, you can look at predicted propagation, read about the island and much more. At this time, though, the T32C team would particularly urge everyone to complete the survey of wanted bands and modes, which will help them in planning their operating schedule.

SPONSORS. As already mentioned, Yaesu have already agreed to be Global Sponsors of T32C. The team have used Yaesu equipment on all their DXpeditions since 1998. Amateur radio retailers Martin Lynch & Sons and Nevada Radio are again sponsoring the DXpedition and the team are very grateful for their ongoing support.

They are actively seeking individual sponsors too. With a project of this magnitude, the huge amount of equipment, antennas and other ancillary gear necessary needs to get to the island. The Five Star DXers Association is seeking sponsorship from DX clubs, societies and individuals to help. All members of the DXpedition are paying their own travel expenses, their accommodation and food on the island as well as making a contribution to the logistics costs. Sponsorship monies will be used to fund the balance of the costs of equipment, antennas, coaxial cable, computers and ancillary equipment, together with the cost of shipping and insurance from Europe to Christmas Island and back, together with Customs and other legal paperwork.

You can help the DXpedition by making a personal donation through the donations page on the website.

USEFUL WEBSITES

[1] T32C: www.t32c.com
CDXC: www.cdxc.org.uk
Previous FSDXA DXpeditions: www.fsdxa.com

Refuelling is a low key affair at the island's airport! Photos by Don, G3BJ.

RSGB shop

The latest An

ANTENNA BOOKS

AGAT	ARRL Guide to Antenna Tuners	£17.99	**£15.29**
ACV8	ARRL Antenna Compendium Vol. 8	£18.99	**£16.14**
ATRA	Antenna Towers for Radio Amateurs	£27.99	**£23.79**
STLH	Stealth Antennas	£13.99	**£11.89**
HFAE	HF Antennas for Everyone	£14.99	**£12.74**
ADNB	ARRL Antenna Designer's Notebook	£27.99	**£23.79**
AFVA	Antennas for VHF and above	£12.99	**£11.04**
UBAN	ARRL Basic Antennas	£24.99	**£21.24**
BSHA	Building Successful HF Antennas	£14.99	**£12.74**
AB2I	ARRL Antenna Book	£30.99	**£26.34**
MVAC	ARRL More Vertical Antenna Classics	£13.99	**£11.89**
PWA2	Practical Wire Antennas 2	£11.99	**£10.19**
INAC	International Antenna Collection	£12.99	**£11.04**
INA2	International Antenna Collection 2	£12.99	**£11.04**
ANTO	Antenna Topics	£18.99	**£16.14**
BKYA	Backyard Antennas	£18.99	**£16.14**
NACO	HF Antenna Collection	£19.99	**£16.99**
HFAL	HF Antennas for all Locations	£19.99	**£16.99**
SAFA	ARRL Simple & Fun Antennas for Hams	£16.99	**£14.44**
YAAC	ARRL Yagi Antenna Classics	£13.99	**£11.89**
ACV1	ARRL Antenna Compendium VOL 1	£15.99	**£13.59**
ACV2	ARRL Antenna Compendium VOL 2	£12.99	**£11.04**
ACV3	ARRL Antenna Compendium VOL 3	£12.99	**£11.04**
ACV4	ARRL Antenna Compendium VOL 4	£15.99	**£13.59**
ACV5	ARRL Antenna Compendium VOL 5	£15.99	**£13.59**
ACV6	ARRL Antenna Compendium VOL 6	£17.99	**£15.29**
ACV7	ARRL Antenna Compendium VOL 7	£18.99	**£16.14**
WACS	ARRL Wire Antenna Classics	£12.99	**£11.04**
MWAC	ARRL More Wire Antenna Classics VOL 2	£12.99	**£11.04**
VACS	ARRL Vertical Antenna Classics	£12.99	**£11.04**
VUCS	ARRL VHF/UHF Antenna Classics	£12.99	**£11.04**

BEGINNERS

AREX	Amateur Radio Explained	£5.79	**£4.92**
PAFN	Practical Antennas for Novices	£7.99	**£6.79**

CALLBOOKS

CB11	RSGB Yearbook 2011 Edition	£18.99	**£16.14**
CS11	Callseeker Plus 2011 (CD)	£15.99	**£13.59**
WC10	World Call CD – Winter 2011	£46.99	**£39.94**

EMC & RFI

EOEN	Elimination of Electrical Noise	£6.99	**£5.94**
RFI3	ARRL RFI Book 3	£23.99	**£20.39**
FRIN	Single Ferrite Ring	£2.25	**£1.91**
FIL3	Filter 3	£10.00	**£8.50**
FIL2	Filter 2	£10.00	**£8.50**
FIL7	Filter 7	£10.00	**£8.50**
FIL8	Filter 8	£29.99	**£25.29**
FL15	Filter 15	£10.00	**£8.50**

GENERAL READING

MIL9	abc Military Aircraft Markings	£9.99	**£7.49**
GPTW	The Greatest Podcasting Tips in the World	£6.99	**£3.99**
GPTW	Robot Builder's Bonanza	£16.99	**£14.44**

MORSE CODE

MC10	Morse Code for Radio Amateurs	£7.99	**£6.79**
INMC	Learning the Morse Code (CD)	£9.99	**£8.49**

TECHNICAL BOOKS

AH11	ARRL Handbook 2011	£37.99	**£32.39**
UNB2	ARRL Understanding Basic Electronics	£26.99	**£22.94**
RH10	RSGB Radio Communication Handbook (CD version)	£14.99	**£12.74**
HBCB	Homebrew Cookbook	£12.99	**£11.04**
RG09	The Rig Guide (including p&p)		**£4.99**
PPEG	125 Physics Projects for the Evil Genius	£14.99	**£12.74**
HORE	ARRL Hands-On Radio Experiments	£14.99	**£12.74**
WEEK	Weekend Projects	£13.99	**£11.89**
RADN	Radio Nature	£16.99	**£14.44**
HFA2	HF Amateur Radio	£12.99	**£11.04**
RFDB	RF Design Basics	£17.99	**£15.29**
LPAR	ARRL Low Profile Amateur Radio	£14.99	**£12.74**
PSHB	Power Supply Handbook	£15.99	**£13.59**
PICB	Pic Basics	£16.99	**£14.44**
CIRO	Circuit Overload	£14.99	**£12.74**
RREG	22 Radio & Receiver Projects for the Evil Genius	£14.99	**£12.74**
EGEG	Electronic Gadgets for the Evil Genius	£14.99	**£12.74**
MEGE	More Electronic Gadgets for the Evil Genius	£14.99	**£12.74**
ARES	Amateur Radio Essentials	£15.99	**£13.59**
EPRC	ARRL Emergency Power for Radio Comms	£14.99	**£12.74**
HART	25 years of Hart Reviews	£14.99	**£12.74**
RFAC	ARRL's RF Amplifier Classics	£14.99	**£12.74**
DMFO	Digital Modes for all Occasions	£18.99	**£16.14**
TEC1	RSGB Technical Compendium	£17.99	**£15.29**
TT50	Technical Topics Scrapbook - All 50 years	£14.99	**£12.74**
TTSB3	Technical Topics Scrapbook 1995-99	£14.99	**£12.74**
TTSB2	Technical Topics Scrapbook 1990-94	£13.99	**£11.89**
TTSB	Technical Topics Scrapbook 1985-89	£9.99	**£8.49**
EMRD	ARRL Experimental Methods in RF Design	£34.99	**£29.74**
HK17	ARRL Hints & Kinks for the Radio Amateur	£13.99	**£11.89**
AICH	ARRL Image Communications Handbook	£19.99	**£16.99**
PSCB	Power Supply Cookbook	£27.99	**£23.79**
DSPT	ARRL Digital Signal Processing Technology	£34.99	**£29.74**
IRFD	Introduction to Radio Frequency Design	£29.99	**£25.29**

OPERATING & DX

LDX5	ARRL Low Band Dxing - 5th Edition	£34.99	**£29.74**
OPM7	RSGB Radio Amateur Operating Manual	£16.99	**£14.44**
ROAR	ARRL Remote Operating for Amateur Radio	£19.99	**£16.99**
SSAR	Storm Spotting for Radio Amateurs	£19.99	**£16.99**
WLOD	World Licensing and Operating Directory	£12.99	**£11.04**
DXCH	ARRL DXCC Handbook	£14.99	**£12.74**
RADO	Radio Orienteering – ARDF Handbook	£9.99	**£8.49**
MOVE	ARRL's Amateur Radio on the Move	£14.99	**£12.74**
DOTE	ARRL DXing on the Edge	£18.99	**£16.14**
WHOS	Who's who in Amateur Radio	£14.99	**£12.74**

COMPUTING AND RADIO

PPFB	ARRL Pic Programming for Beginners	£32.99	**£28.04**
VOIP	ARRL VoIP Internet Linking for Radio Amateurs	£15.99	**£13.59**
RTTY	RTTY/PSK31 for Radio Amateurs	£7.99	**£6.79**
HFDH2	ARRL HF Digital Handbook 4th Edition	£14.99	**£12.74**
VHDH	ARRL VHF Digital Handbook	£14.99	**£12.74**
COMM	CoMmand	£16.99	**£14.44**

VHF/UHF BOOKS

SMHB	6m Handbook	£13.99	**£11.89**
VHF2	VHF/UHF Handbook	£14.99	**£12.74**
YGVU	Guide to VHF/UHF	£9.99	**£8.49**

RadCom 2010 CD

from £16.99

Volume 86 **New Edition**

This CD contains every word of every page published in *RadCom* during 2010 and much more besides. Everything in the magazine including all the adverts is provided in an easy to use PDF format. Not only can you print any of the 1000+ pages included but you can search the text for those specific items you want. The very latest version of the Adobe Acrobat X software is included on the CD if you don't already have a copy. There are also samples of other RSGB archive CDs and extracts from RSGB books.

If you want to free up some shelf space and still keep all your *RadComs* handy for future reference there is no better way than the *RadCom 2010 CD*.

With this CD you can:

- ✓ View all the words, diagrams and pictures
- ✓ Search for any word or phrase
- ✓ Jump quickly from the contents page to each article
- ✓ Print out any page
- ✓ Store all 12 months of *RadCom* easily

Includes the latest Acrobat Reader X

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

POST & PACKAGING FREE

Order on the internet at **www.rsgbshop.org** or you can order by post making cheques and postal orders crossed and made payable to Radio Society of Great Britain or telephone your credit card order to **01234 832 700**. Open 8.30-4.30 (Mon-Fri). Send no cash. **Post & Packing:** Standard Delivery - 2nd Class Post (4-9 Days), For one item £1.95, For two or more items: £3.50, **For orders over £30.00 standard delivery is FREE.** Priority Delivery - 1st Class Post (2-4 Days), For one item £2.95, For two items: £4.95 , For three or more items: £5.95. **Overseas:** Worldwide Surface Delivery, For one item: £3.00, For two items: £5.00, Extra items: £1.00 per item. Worldwide Air Delivery: For one item: £9.00, For two items: £15.00, Extra items: £3.00 per item.

nateur Radio titles

RADCOM			
0RCB	RadCom Back Issues		**£4.25**
EAZI	RadCom Easi-Binder		**£8.99**
BV10	RadCom Bound Volume 2010		**£49.99**
SINGLE YEAR RADCOM CDS			
RC**	Available from 1996 – 2010 Price for Each Year	£19.99	**£16.99**
RADCOM CD-ROM SETS			
RC9195	RadCom 1991-95 Set	£29.99	**£25.49**
RC8690	RadCom 1986-90 Set	£29.99	**£25.49**
RC8185	RadCom 1981-85 Set	£29.99	**£25.49**
RC7680	RadCom 1976-80 Set	£29.99	**£25.49**
RC7075	RadCom 1970-75 Set	£29.99	**£25.49**
RC6469	RadCom 1964-69 Set	£29.99	**£25.49**
RC5363	RadCom 1954-63 Set	£29.99	**£25.49**
RC3953	RadCom 1939-53 Set	£29.99	**£25.49**
MICROWAVES			
MKHW	Microwave Know How	£12.99	**£11.04**
IMH2	International Microwave Handbook 2	£16.99	**£14.44**
MICP	Microwave Projects 1	£16.99	**£14.44**
MIP2	Microwave Projects 2	£16.99	**£14.44**
IOTA			
ID09	IOTA Directory	£9.99	**£8.49**
MONTHLY PUBLICATIONS			
QST1	ARRL Subscription 1 Year		**£44.00**
QST2	ARRL Subscription 2 Year		**£82.00**
QST3	ARRL Subscription 3 Year		**£115.00**
QSTC	ARRL Subscription CD only 1 Year		**£32.00**
QSTC2	ARRL Subscription CD only 2 Years		**£62.00**
QSTC3	ARRL Subscription CD only 3 Years		**£89.00**
PACKET & APRS			
PRPR	Packet Radio Primer	£9.99	**£8.49**
LOW POWER (QRP)			
INQC	International QRP Collection	£12.99	**£11.04**
LPC3	ARRL Low Power Communications	£14.99	**£12.74**
MQRP	More QRP Power	£16.99	**£14.44**
QRPB	QRP Basics	£14.99	**£12.74**
MAPS			
PRE9	RSGB Prefix Guide 9th Edition	£8.99	**£7.64**
RAWA	Radio Amateurs World Atlas	£9.99	**£8.49**
LOCE	Wall Locator Map of Europe (B&W)	£2.99	**£2.54**
LOCD	A4 Locator Map of Europe (B&W)	£2.99	**£2.54**
RAMW	World Prefix Map (Colour)	£6.99	**£5.94**
SPACE & SATELLITES			
ARA2	Amateur Radio Astronomy - 2nd Edition	£16.99	**£14.44**
SAT2	ARRL Satellite Handbook	£19.99	**£16.99**

PROPAGATION			
RPPP	Propagation - Principles & Practice	£14.99	**£12.74**
SHORT WAVE LISTENING			
VREX	Virtual Radar Explained	£6.99	**£5.94**
ABR7	Air Band Radio Guide	£9.99	**£7.49**
AT10	Air Traffic Control	£9.99	**£7.49**
USG3	Radio Today Ultimate Scanning Guide	£19.99	**£16.99**
HISTORY BOOKS			
IN40	Inside Room 40	£19.99	**£14.99**
TSR2	The TSR2 Story	£19.99	**£14.99**
SLBB	Spies Who Lost the Battle of Britain DVD	£12.99	**£9.99**
INEG	Inside Enigma	£14.99	**£12.74**
IMAS	Images Across Space	£19.99	**£14.99**
ORFD	Most Secret: The Hidden History of Orford Ness	£14.99	**£11.24**
BDTR	The Bedford Triangle	£9.99	**£7.49**
HSOE	Heroines of SOE	£18.99	**£14.24**
HSPT	Haynes Manual for Supermarine Spitfire	£19.99	**£16.99**
H109	Haynes Manual for Messerschmitt Bf109	£17.99	**£15.29**
WRST	What Really Sank the Titanic	£9.99	**£7.49**
RENH	The Real Enigma Heroes	£19.99	**£16.99**
FCIR	Full Circle: A Dream Denied, A Vision Fulfilled	£10.99	**£9.34**
EGOU	Edgar Harrison	£14.99	**£12.74**
AVRO	Avro Vulcan: Britain's Cold War Warrior	£19.99	**£11.99**
ENUB	Enigma U-Boats	£8.99	**£6.74**
CAPE	Capturing Enigma	£8.99	**£6.74**
HLAN	Haynes Manual for Avro Lancaster	£17.99	**£15.29**
HAPO	Haynes Manual for Apollo 11	£19.99	**£16.99**
BSAC	Between Silk and Cyanide: A Code maker's War	£14.99	**£12.74**
ABOC	A Bit of Controversy	£13.99	**£11.89**
PTCG	Perera's Telegraph Collectors Guide	£9.99	**£8.49**
CHJH	Captain Henry Jackson of HMS Defiance	£9.99	**£8.49**
TSOE	The Story of Enigma (CD)	£9.99	**£8.49**
TCCD	Perera's Telegraph Collectors CD	£9.99	**£8.49**
BOXS	1940s Amateur Radio Set	£15.99	**£13.59**
WATF	World at Their Fingertips	£9.99	**£8.49**
TRAINING			
EXSE	Amateur Radio Exam Secrets	£12.99	**£11.04**
FNOW	Foundation Licence - NOW!	£4.99	**£4.24**
IMD5	Intermediate Licence Book	£6.99	**£5.94**
ADVA	Advance! The Full Licence Manual	£11.99	**£10.19**
IEXM	International Amateur Radio Exam Manual	£14.99	**£12.74**
LOGGING			
DL11	Deluxe Log Book 2011	£4.99	**£4.24**
LBAR	Log Book - Transmitting	£4.99	**£4.24**
LBRX	Log Book - Receiving	£4.99	**£4.24**
COVL	Logbook Cover for LBAR or LBRX	£6.50	**£5.53**
LOW FREQUENCY			
LFT2	LF Today 2nd Edition	£12.99	**£11.04**

New books displayed Red RSGB Members' Prices displayed **BOLD**

RSGB SHOP ORDER FORM

PLEASE PRINT ALL

NAME CALLSIGN

ADDRESS

POSTCODE TELEPHONE E-MAIL

QUANTITY	CODE	DESCRIPTION/TITLE	PRICE	TOTAL

PLEASE CHARGE MY CREDIT/DEBIT CARD

EXPIRY DATE START DATE CVV2* ISSUE NUMBER

*3 DIGIT CODE FROM THE BACK OF YOUR CARD

SIGNATURE DATE

P&P

TOTAL

3 Abbey Court, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496
E&OE **All prices shown plus p&p**

Radio Society of Great Britain
www.rsgbshop.org

The radio... YAESU
Choice of the World's top DX'ers℠

The Evolution of the FT DX 9000 Series
The Powerful FT-2000

- Strong receiver front end includes VRF (Variable RF Tuning) preselector and optional external High-Q Tuning for the 1.8 - 14 MHz bands
- First IF Roofing Filters of 3 kHz, 6 kHz and 15 kHz included (Main VFO-A)
- Strong receiver design provides wide dynamic range and high 3rd order intercept point
- Wide array of IF-DSP interference-rejection filters (Main VFO-A)
- External display port for viewing a wide range of information including RF and Audio Scopes (Optional DMU-2000 Data Management Unit and monitor are required)

Now including the
PEP-2000
(Performance Enhancement Programme)

HF/50 MHz Transceiver

FT-2000

- FT-2000D 200 W with External Power Supply
- FT-2000 100 W with Internal Power Supply

www.yaesu.co.uk

Shown with after-market keyer paddle, keyboard, and monitor (not supplied). Optional Data Management Unit (DMU-2000) and monitor are required for viewing of Audio Scope and other display features.

Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

Vertex Standard
Commercial Radio
www.vertexstandard.co.uk

YAESU
Amateur Radio
www.yaesu.co.uk

STANDARD HORIZON
Marine Electronics
www.standardhorizon.co.uk

HF F-Layer Propagation Predictions for March 2011

Compiled by Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe								
Moscow	86.....7778	872....38878	..634466883.	..3777888...	...899997...	...68998....	.....77.....	.....
*** Asia								
Yakutsk	.....4..	5764	..4...565663	...666.....	....6.....	....4.....	.....	.....
Tokyo	.....33..	.....6773.	.....3...	.....	.....	.....	....4.....	.....
Singapore	.....122.	78773	.....562..	.....263...	.....66....	.....55....	.....	.....
Hyderabad	.....	4434	26533	.....56...	.....454...	.....45....	.....	.....
Tel Aviv	98.....8899	986....69999	..6....7883.	...545688...	...688886...	....5666....	.....	.....
*** Oceania								
Wellington	.....	.....6...	.....46...	.....3..4...	.....	.....	.....	.....
Well (ZL) (LP)	.....	..7.....	469.....633	658.....865	.....4..	.....	.....	.....
Perth	.....	.....4776.	.....7764.	.....466...	.....	.....	.....	.....
Sydney	.....	.....776..	.....6885..	.....4776...	.....	.....	.....	.....
Melbourne (LP)	...1.....	..89.....	36897.....	5..983.....4	...88....45.	....7.....	.....	.....
Honolulu	.....	.....	...65.....	.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....6...	.....	.....	.....	.....
W. Samoa	.....	...3.....	...5555.....	....567.....	....467.....	.....56.....	.....	.....
*** Africa								
Mauritius	2.....222	7.....7877	5.....68876	.....886..	.....77...	.....75...	.....	.....
Johanesburg	.....	33.....4655	77.....9999	79976	.....5...	.....	.....55...	.....
Ibadan	12.....11	67.....2566	776.....6766	5.7.....78..	...64.4688..	...7666786..	...677778...	....67775...
Nairobi	3.....112	86.....7788	65.....5566	.....4663.	.....674..	.....566...	...666775...	....4665....
Canary Isles	676.....666	787.....5888	8886...37888	4..7545786 83	....799989..	....599998..	.....8889...	.....7676...
*** S. America								
Buenos Aires	.....	433.....2	6556.....66	...5.....44.	.....4..	.....	.....	.....
Rio de Janeiro	.....	544.....34	766.....787	.....85.	.....36..	.....44..	.....	.....
Lima	.....	33.2.....2	65.7.....65	...5.....4.	.....	.....	.....	.....
Caracas	.....	433.....23	8747.....87	...45....67.	.....54567..	.....66676..	.....6576...	.....
*** N. America								
Guatemala	.....	21.1.....	52.6.....5	.....	.....	.....	.....	.....
New Orleans	222.....	6662.....6	6..6.....36	.....3..	.....	.....	.....	.....
Washington	344.....2	7774.....37	74.33.....77	.....366.	.....3..45..	.....455...	.....	.....
Quebec	675.....25	765.....376	...5.....66.	....4.3566..	.....4....	.....	.....	.....
Anchorage	.....	354.....	3.....335.	.....56..	.....5..	.....	.....	.....
Vancouver	.....	.32.....	.....	.....	.....5...	.....	.....	.....
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....6....	.....6....	.....6....	.....4....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong. The RSGB Propagation Studies Committee provides propagation predictions on the internet at www.rsgb.org.uk/propagation/index.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 March, April and May are respectively (SIDC classical method – Waldmeier's standard) 31, 34 & 37 and (combined method) 57, 61 & 66. The provisional mean sunspot number for January 2011 was 19.0. The daily maximum / minimum numbers were 37 on 1 January 2011 and 0 on 14 January 2011.

RadCom

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 April *RadCom* is 28 February and for the May edition it's 1 April. For GB2RS, the deadline is 10am on the Tuesday for the week of broadcast.

1 SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, RM1@RSGB.ORG.UK

AYR ARG
Tom Ferguson, GM1OST, 01292 532 088
9 Presentation on Bletchley Park
23 Presentation on garden aerials

BORDERS ARS
Danny, 2M0CDO, 01890 882850
11 Club night / programme planning

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
18 Talk on RAYNET by Malcolm Gibson, MM0YMG

LIVINGSTON & DARS
Norman, 07740 946192, uk.groups.yahoo/group/ms0liv
1, 15, 29 Club evening
8 Operating evening
22 Morse code practice

LOTHIANS RS
Andy Sinclair, lrs_secretary@moosedata.com
9 Getting started on 70 & 23cm by Ray, GM4CXM
23 Expedition Senegal by Tom Wylie, GM4FDM

WEST OF SCOTLAND (GLASGOW) ARS
Fred Coombes, 2M0BIN, 01415715512, www.wosars.org.uk
2, 9, 16, 23, 30 Solder Group homebrew projects & licence training
4, 11, 18, 25 Presentations, guest speakers, raffle & quiz

2 SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

ABERDEEN ARS
Lewis, GM4AJR, 01224 575 663, www.radioclubs.net/aars/
3 Junk sale
10 Morse practice + on the air
17 Testing antenna analyser
24 Surprise talk
31 Discussion evening for programme of events

3 NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

90 SPEKE SQUADRON ATC RADIO CLUB
Norman, M0NOW
5 Radio day in support of Marie Curie cancer research, Operating HF-VHF, PSK, 10am-10pm, GB0MAC & MX0NAC

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
14 Guest speaker: RSGB President Dave Wilson, M0OBW
28 Starting out in ATV, Derek, G1AEQ

CHESTER & DARS
Barbara Green, 07957 870770, www.chesterdars.org.uk
1 Amateur radio licensing & exams by Keith, GW4OKT
15 RAYNET by Jon Mossman
22 Familiarisation on the K3
29 Radio operations at Waverton Institute

MID-CHESHIRE ARS
Peter Paul Fox, G8HAV, 01606553401
2 M6MHD on 7 1/4 inch model railway
9 Committee meeting
16 VHF/HF OTA
23 Small talk by G8SIG
30 Mapping software by G0LBO

PRESTON ARS
Richard, M0RDZ, 07855873566, secretary@prestonars.co.uk
31 Talk on SOTA

SOUTH MANCHESTER R&CC
Ron, G3SVW, 0161 969 3999
3 PC Clinic Dave G4UGM
10 Papua New Guinea by Bill, G4NOL
17 Visit from RSGB President Dave Wilson, M0OBW
24 Equinox junk sale
28 Monthly technical forum (bring along your projects and problems)
31 Rene Descartes by Dave, G4UGM

SOUTH NORMANTON ALFRETON & DARC
A Lawrence, 2E0BQS, adylawri@btinternet.com
7 Junk sale
14 Natter night
21 EMC by Don Beattie, G3BJ
28 Informal night

STOCKPORT RS
Nigel Roscoe,07973 312 699, info@g8srs.co.uk
1 New licensees' evening and the St David's day local net.

THORNTON CLEVELEYS ARS
Colin Hirst, G0EPY, colmay@sky.com
7 Natter night
14 Treasure of the Humboldt Glacier by Mick, G4EZM
21 NARSA Talk

WORKINGTON & DAR&IT GROUP
Barry Easdon, G0RZI, 01946 812092
14 Phased verticals by Steve, G0MTD
28 Club meet and OTA

4 NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, G0UGE, RM4@RSGB.ORG.UK

DENBY DALE RC
Richard, M0RBG, 07976 220126, m0rbg@talktalk.net
2 The RSGB QSL Bureau by Richard, G3UGF
16 Planning for Huddersfield Narrow Canal bicentenary
23 QRP by George Dobbs, G3RJV

EAST CLEVELAND ARC
Alistair, G4OLK, 01642 475 671, alistair.mackay@talk21.com
4 Radio magazines evening
11, 25 OTA
18 Bring in something interesting evening

GRIMSBY ARS
Cliff G4YHP, 01472 328 830
3 Natter night
9 Visit by RSGB Region 4 representative
16, 30 Natter night
24 Club meeting

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240573, gmacnaughtwov@yahoo.co.uk
2 DVD show
9 Heathrow communications
16 Activity plus CW competition
23 DF theory
30 Static communications

OTLEY ARS
Paul, 2E0PAK, 07768 996370, m6wat@pekae.co.uk
1 144MHz UKAC, G3XNO
8 DXpedition presentation
15 Open shack night / tech chat
22 50MHz UKAC, G3XNO + natter night
29 70MHz UKAC, G3XNO

RIPON & DARS
Rob Hall, M0RBY, 0787 608 5631 or 01677 460449, www.ripon.org.uk
3 Club night on the air
10 Club night on the air
17 Talk on the relay-switched dipole
24 Club night on the air

SCARBOROUGH AMATEUR RADIO SOCIETY
Jerry Scarr, G6LBL, 01751 476601, jerryscarr@googlemail.com
7 Earth measurements by Dave, G4DAX
14 The history of Ever Ready by Bob, M0GAP
21 Constructing an Elecraft K2 by Robert, G0WHO
28 Amateur use of Clansman radios by Stewart, G8YQN

SHEFFIELD ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
7 Social evening plus club contest night
14 Open evening for National Science Week
16 SARC visits local schools in National Science Week
21 Mini flea market & quiz night
28 AGM

5 WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, M0VRR, RM5@RSGB.ORG.UK

CHELTENHAM ARA
Derek Thom, G3NKS, 01242 241099, chairman@caranet.co.uk
17 Constructors' exhibition

COVENTRY ARS
John, G8SEQ, 07958 777363
4 The work of Myton Hospice by Clair McDowell
11, 18 Project 2011 construction night
25 President's night

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
2 Open meeting, OTA & training classes
9 Committee meeting & training classes
13 Visiting Wythall Radio Rally
16 Rally, contest planning & training classes
23 More planning for 80th year & training classes
30 Laptop computer training & foundation classes

SOUTH BIRMINGHAM RS
Don, 0121 458 1603, www.radioclubs.net/southbirmingham
2 Lecture in main hall
3, 10, 17, 24, 31 Training classes with Dave, G8OWL
4 Construction evening
7 OTA & field day review
11 Loading trailer with gear for Wythall rally
13 Wythall Radio Rally
14 Unloading trailer & rally debrief
18, 25 Construction evening
21 Committee meeting
28 VHF Field Day planning

STRATFORD UPON AVON DRS
G0CHO, 01608 664488, cousbey@theiet.org
14 Test equipment evening, John, G0JUQ

TELFORD & DARS
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@blueyonder.co.uk
2 G3ZME HF/VHF OTA, committee meeting
8 Hamfest committee
9 Main construction competition
16 Kites as antenna supports by Roger, G4ROJ
23 2m DF - bring your kit & get it checked out
30 AGM

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620733
7 Feeding antennas by Simon, MW0GSR, of Snowdonia Radio Co
21 SOTA & mountain rescue by members of the Aberglaslyn Mountain Rescue Team

6 NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

WREXHAM ARS
Patrick, 2W0HUU, 07947 701 927
1 AGM
15 The early history of radio, GW8NZN

7 SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, RM7@RSGB.ORG.UK

LLANELLI ARS
Craig, MW0MXT, 01269 840292, craig@mw0mxt.co.uk
7 OTA, GB4SD
14 OTA, GB4SD & club raffle
21 Social evening
28 Junk sale & club raffle

8 NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, RM8@RSGB.ORG.UK

BANGOR & DARC
Mike, GI4XSF, 028 4277 2383
3 Mr Marconi's magic box by Brian Clarke

GLENGORMLEY ELECTRONICS ARS
Peter Lowrie, MI5JYK, mi5jyk@rsgb.org.uk
14 2m OTA

9 LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

BROMLEY & DARS
Andy, G4WGZ, 01689 878089
15 Low earth orbit satellites

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
7 AGM
21 Code cracking by Ian, M1FHU

COULSDON ATS
Steve Beal G3WZK, secretary@catsradio.org
14 Building and using the Ten-Tec 1330 by Martin, M1MRB

CRAY VALLEY RS
Bob, M0MCV, 020 8265 7735 after 8pm
3 Construction contest, Chris, G0FDZ
17 Reprise of special events with videos – Bob, M0MCV & Paul, G3SXE

CRYSTAL PALACE R&EC
Bob, G3OOU, 01737 552 170
4 Building and using the Ten-Tec 1330 by Martin, M1MRB

DORKING & DRS
Garth, G3NPC, 01737 359472, www.ddrs.org.uk
22 Home construction techniques, Bob, G3OUU

ECHELFORD ARS
John, G4GSC, 01784 451898, jho_g4gsc@talktalk.net
10 Construction contest
24 Bring & buy, CW practice, natter night

EDGWARE & DRS
Mike, G4RNW, 020 8950 0658, michael.stewart5@ntlworld.com
10 The Secret Wireless War part 2
24 Round table with John, G3SJE: in defence of DAB

NEWBURY & DARS
Rob, G3LMW, 01635 862737, g4lmw@btconnect.com
23 All at sea talk by Richard, G3ZGC

READING & DARC
Pete, G8FRC, 01189 695 697
3 Wireless workshop evening - what antenna to put up?
10 Weather balloon telemetry project, Daniel, 2E0DRX & colleagues.
18 Foundation course starts, contact Eric m0luv@radarc.org

SHEFFORD & DARS
David, G8UOD, 01234 742 757, www.sadars.co.uk
3 The Bombe by John Harper
10 AGM
31 A film show by Paul Schimmel

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
9 Spring junk sale

SURREY RADIO CONTACT CLUB
John, G3MCX, 020 8688 3322, john.g3mcx@btinternet.com
7 Surplus sale

SUTTON & CHEAM RS
John, G0BWV, 020 8644 9945, info@scrs.org.uk
17 Behind the scenes at Bletchley Park in WWII by Brian Oakley

WEY VALLEY ARG
www.weyvalleyarg.org.uk
4 HF transmitters at the BBC by Tony Crake
18 Club night

WIMBLEDON & DARS
Andrew Maish G4ADM, 020 8335 3434
11 OTA & foundation training
25 Radio topics with Andrew, G4ADM

10 SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

ANDOVER RAC
Martin, M0MWS, 07776181646, www.arac.co.uk
1 Club night
15 Club night, committee meeting

HARWELL ARS
Malcolm, G8NRP, 01235 524844, info@g3pia.org.uk
8 Smith Charts, Ron, G7DOE
22 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909, www.herc.uk.net
23 The career of a merchant navy radio electronics officer in the 1970s and 80s by Tim, G4EOA

HORNDEAN & DARC
Stuart, G0FYX, 023 9247 2846, www.hdarc.co.uk
1 Natter night/social evening
22 Signal level project by Ronald, G3UKU

HORSHAM ARC
www.harc.org.uk
3 Used equipment sale
17 Social at The Plough, Rusper

MID-SUSSEX ARS
Peter, G4AKG, 01444 239371
4, 25 Radio night
11 Earthing radials & PME by Peter, G4AKG
18 Radio night & table top sale

SWINDON & DARC
Den, M0ACM, 07810 317750, www.sdarc.net
3, 17, 31 Activity night
10 Construction contest
24 Talk

WATERLOOVILLE ARC
Rich, G4IBW, 02392680852, g4ibw1@ntlworld.com
25 EGM

WORTHING & DARC
Phil, G4UDU, 01903 816684
2 Round table forum
6 Sunday morning breakfast meeting in Goring
9 Discussion evening
16 The history of light bulbs by John Narborough
23 Discussion evening

11 SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473251
21 AGM

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420442
28 WRTC 2010 in Russia by Roger, G3SXW

CORNISH RADIO AMATEUR CLUB
Steve, G7VOH, 01209 844939, G7VOH@btinternet.com
2 Introduction to Foundation course
5, 12, 16, 23 Foundation course

EXETER ARS
Nick, 01363 775756, info@exeterars.co.uk
14 Club general meeting
28 Club night and CW practice

MID SOMERSET ARC
Nick, M6NJB, 01749 346320, nick.bennett@midsarc.org.uk
8 Talk on GB3JB & GB3WX repeaters by Dave, G3ZXX
11 Club visit to Rampisham transmitting station

SALTASH & DARC
Brian, M0BHG, 01752 844321
4 OTA

SOUTH BRISTOL ARC
Andrew Jenner, G7KNA, 07838 695471
3 Homebrew evening
10 South Atlantic DXpedition video with Adrian, 2E0JUW
17 Quiz night with Muriel, G4YZR
31 OTA

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
2 The thermionic valve (part 1) by Mike, M0CIE
16 Committee meeting

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417048, tonytsgarc@btinternet.com
2 How I got into amateur radio by Rex, G4RAE
9, 23, 30 OTA
16 Video night

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
4, 11, 18 Natter night
25 Presentation night with buffet

WEST DEVON RC
Jules Cuddy, M1AGY, 01752 291588
1 Antenna talk by Paul, 2E0XVI
15 Thermionic night - valves & vintage demo
29 General chat night open too all

YEOVIL ARC
Steve Crask, G7AHP, steve@g7ahp.co.uk
3 My new shack, M6DGM
10 Tracking satellites, G3RTD
17 QRP Convention briefing
20 QRP Convention, Digby Hall
24 My kite aerial, M0WOB
31 Committee meeting & OTA

12 EAST & EAST ANGLIA

REGIONAL REP: NEIL WHITESIDE, G4HUN, RM12@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404154, secretary@bittern-dxers.org.uk
10 Informal meeting
31 Update on social and competitive events for the year

BRAINTREE & DARS
John, M5AJB, 01787 460 947
7 Four short talks by club members
21 Construction evening

CAMBRIDGE & DARC
Ron Huntsman, 012233 501712
3 Morse for all abilities
11 Rally planning evening
13 Cambridge & District Amateur Radio Club Rally
18 Rally report evening
25 Discussion evening on earthing

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008, www.g0mwt.org.uk
1 IOTA by Martin, G3ZAY
8, 15, 22, 29 Club net night
9 Committee meeting, Danbury Village Hall

COLCHESTER RADIO AMATEURS
Kevan, 2E0WMG, 7766543784, kevan2e0wmg@live.co.uk
17 Talk by Mark, M0IEO, RSGB Essex DRM

FELIXTOWE & DARS
Paul, G4YQC, pjw@btinternet.com
21 AGM

HARWICH ARIG
Kevan, 2E0WMG, 07766 543784 kevan2e0wmg@live.co.uk
9 Model Trains by John G3YYZ

Continued on page 86

FOR SALE

3 MOTOROLA HT6000 UHF full coverage of 70cm with charger, £40 each. 2 Kenwood VHF TK-259, full 2m with repeaters + CTCSS, £50 for pair. 1 PFX on 70cm with charger, VGC, £20. All prices subject to sensible variance. Alan Marwood, G8SSL, 07976 664632 (Nottingham).

50 + YEARS OF *RADCOM* / Radio Communication. Early issues are bound. Free to a good home. Will need to be collected. R Staniforth, G3EGV, 01305 833665 (Weymouth).

60ft HD TRAILER VERSATOWER £3000. Good condition, new winch ropes, head unit, accessories. Can deliver. More details at www.cdxc.org.uk/notices Sensible offers considered. Dave Gould, G3UEG, 01279 427788, dave@g3ueg.co.uk (Harlow).

FLEX 5000A with optional second Rx. Excellent condition, £2200. Acom 1000 HF/6m amplifier, £1350. Option of buying both together for £3250, + delivery/carriage. David, 2E1HIT, 07817 513598 (Mansfield).

FT-101ZD mk III, WARC bands, FM, with mic, handbook, service manual, £150. FT-736R, 6m, 2m, 70cm, with mic, handbook, £450. Buyers to collect from Anglesey or Derby. Brian, GW3RKZ, 01248 722041 after 6pm please (Anglesey, North Wales).

HOLIDAY WITH YOUR AERIALS! Self-catering, smoke-free studio cottage near the middle of a long 3-acre garden. Sleeps 2 (twin beds). Peaceful, electrically quiet, rural area. Non-amateur owner happy for you to erect temporary (big!) aerials. Only £200 per week (Sat-Sat). Diana, 01308 485301 (W Dorset).

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).

IC-735, HM12, boxed, £250. IC-3220H, HM14 dualband mobile, boxed, £95. FT-736R all mode VHF/UHF, £520. Daiwa PS-30XM11, £50. MFJ-259 analyser, £140. Yupiteru MVT-7100 scanner, £60. TH-G71 FM dualbander, £120. ICOM SP-20 external speaker/filter unit, £75. bhi NEIM1031 noise filter, £100. Tony, G3KAG, 01335 324393, rostonya93@hotmail.co.uk (Ashbourne).

ICOM R-75 for sale complete with CW filters. £350, carriage paid UK mainland. G0FUV, 01409 231631, john@johnfmills.plus.com.uk (Okehampton).

KENWOOD TS-850. Internal auto ATU, internal voice and keying recorder, Kenwood IF232 PC interface box, extra 270Hz and 400Hz filters fitted for CW. Good condx and in full working order. Boxed and complete with DC leads, mic, manual. £400 ONO. Demo can be arranged. Terry Downing, G3MXH, 01664 454949, terry.downing@btinternet.com (Leicestershire).

RADIOS. FRG-7, HA800, needs tuning, £30 ea. Clark welder as new, AS90, £40. Books: radio & TV servicing, 15 volumes, £10. Grundig radio centre 240, £20. D Griggs, G0IPT, 0208 374 9070 (London).

RECEIVERS FOR SALE. AR88D, S-meter, VGC, £95. AR88D, working, needs TLC, £35. Ekco 'Mariner' (Pye), immaculate, £50. Marconi Guardian II, £40. Marconi 'Kestrel', £40. Eddystone 940, £65. Collect only please. Richard, G0OGN, 01789 293375 (Stratford-upon-Avon).

SIGNAL GENERATOR CT212 85kHz-32MHz in 7 bands. Output variable up to 100mV. CW/AM/FM. 7xB7G valves. Mains and output leads. Ex-Navy, 1957. Good condition. Handbook photocopy with schematic. Photo at www.portabletubes.co.uk/testing. 230VAC. 9x14x11", 30lb. Buyer collects. £35, offers considered. Peter Ball, G3HQT, 01489 570735 (Warsash, nr Southampton).

SOTA BEAM 3/5 elements 2m 10.5dB gain with all fitting and more with pole to match, £50. ZL special 7-ele beam 70cm 11.5dBd gain, as new, £30. 6m beam, Trident, 3-ele, £60, ready to put up. Fred, M0CVS, 01629 823025 (Matlock, Derbyshire).

WATSON MULTI-RANGER 9, HF-UHF multi band mobile antenna. Covers 80, 40, 20, 15, 10, 6, 2m & 70cm. In very good condition, £30 plus postage. Pro-AM HF mobile antenna 40m in very good condition, £8 plus postage. Cameron, G0CAM, 01209 820967 (Redruth).

YAESU FT-840 + Watson WM308, £250. Yaesu FRG-7, £40. Lowe HF-225 Rx, £60. Daiwa 500W ATU, £20. G3UEY, 01386 553037 (QTHR, Pershore).

YAESU FT-857D HF/6m/2m/70cm, was under warranty until 14 December 2010. Included is a Moonraker MRQ-800 tri-band (6/2/70cm) antenna. Boxed, c/w manual, £500. Collection preferred, or plus postage. Genuine reason for sale. Alan, 2E0VAV, 0208 6425793, allan.singer@virgin.net (Sutton, Surrey).

WANTED

60ft+ TELESCOPIC MAST. Willing to dismantle and collect. John Farrer, G3XHZ, 07843 793361, farrerj@yahoo.com (Saffron Walden).

DISABLED FAN OF OLD DAYS seeks pre-1975 QSLs, magazines, etc. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

PANEL METERS. White plastic, 1 11/16 inches square, MR38 type.100mA / 10mA / 1mA. Also acceptable 50mA / 5mA / 50μA. Valves: 6BW6. Bruce, G3WCE, 01692 538794, g3wce@grimblepoos.co.uk (North Walsham).

POWER SUPPLY FOR DRAKE L-4B amplifier. Modulator/power supply for Labgear LG300. Any old Collins equipment considered. All working or non working. Roy Reed, G3ZIG, 01362 688430 (Dereham).

HELPLINES

Respondents are advised not to send original documents, but to copy them and send the copies.

COPY OF SERVICE MANUAL or advice for Sony U-matic videocassette recorder VO-5800PS. My cassette-loading process halts just after tape-threading starts, even after I fitted new belts. Richard Johnson, GM7NHS, richard@rpcjohnson.com (Aberdeen).

LEISTON ARC
Dave, G4HUP, 0777 764 8448, g4hup@btinternet.com
2 Working with SMD components by Dave, G4HUP

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC, 020 8502 1645
11 Our first 50 years by the Committee
25 OTA, HF data

LOWESTOFT & DISTRICT PYE ARC
Lee, 2E1LJL, 01502 564242, leejlewis@hotmail.co.uk
3, 17, 24, 31 Club night at shack
10 Junk and Tabletop Sale More Info at www.lowestoftar.co.uk

NORFOLK ARC
Chris Danby, G0DWV, 01603 898678, cmdanby@btinternet.com
2 How, why & which connectors to use, Mark, G0LGJ
7 RSGB CC Data contest
9 DIY aerial digital photography by John, M6JAU
16 Informal / construction / shack / Bright Sparks / RSGB CC CW contest
23 The RSGB – what it can do for you? by RSGB President Dave Wilson, M0OBW
24 RSGB CC SSB contest
27 IOTA by Martin, G3ZAY
30 Table top sale

SOUTH ESSEX ARS
Norman, M0FZW, 01268 692776, secretary@southessex-ars.co.uk
9 Life as a ship's radio officer by Dave, G4AJY

WEST KENT ARS
Les, G6UBM, westkentars@googlemail.com
14 Club evening, presentation

13 EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

DERBY & DARS
Richard Buckby, radio@dadars.org.uk
1 Junk sale
8 Committee meeting
15 Quiz night
22 AGM
29 OTA

EAGLE RG
Terry, G0SWS, 01507 478590
8 Eagle Radio Group's year in pictures by Nevil, G3VDV

FRISKNEY AND EAST LINCOLNSHIRE COMMS CLUB
Chris M0MFP, 01507 442240
1 Antennas talk by Colin, G4DDI

HINCKLEY ARS
John, M0JAV, m0jav@lowgables.co.uk, 07836 731544
2 Social evening / open forum on next year's programme
9 Workshop: digital modes
16 Health & Safety / Risk assessments, Keith Tonks
23 Club members' mini talks
30 Junk sale, Mark, 2E0SBM

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO, 01427 788356, pamelagrose@tiscali.co.uk
2 Discussions on CQ WW WPX Contest
5, 12, 19, 26 G5FZ OTA & work around the shack
9, 23 G5FZ OTA / natter night
16 G6COL OTA / natter night
25 CQ WW WPX Contest
30 Surplus equipment sale at the Village Hall

LOUGHBOROUGH & DARC
Chris, G1ETZ, 01509 504 319
1 Annual dinner
8 Portable 2m antennas by Art, G3KWY
15 Vintage Equipment - bring something along
22 What keeps your lights on? by George, G4EUF
29 Practical evening

NUNSFIELD HOUSE ARG
Ken Frankcom, G3OCA, 01332 720976
4, 18, 25 RSGB project
11 Prevention of terrorism by Julie Coulton, Derbyshire Constabulary

WELLAND VALLEY ARS
Peter D Rivers, G4XEX, 01858 432105, g4xex@fsmail.net
21 Bonito software talk/demo

LAMCO

LAM COMMUNICATIONS LTD

01226 361700

01226 351037

call us on skype now: lamcomms

www.lamcom.eu

www.lamcommunications.net

sales@lamcommunications.net

We are MAIL-ORDER SPECIALISTS for all of the UK-EU tracked FedEx

LAMCO APPROVED

ICOM KENWOOD YAESU

USED EQUIPMENT WITH 12 MONTHS WARRANTY

PRODUCTS

LDG · DIAMOND ANTENNA · LAMCO · MFJ · SRC · FlexRadio Systems · WATSON · M0CVO AERIALS

BEST SELLERS

Kenwood TS-590S	£1,379.95
Icom IC-7600	£3,299.95
Yaesu FT-897D	£776.95
Yaesu FT-950	£1,314.95
Icom IC-E92D	£379.95
FlexRadio 3000	£1329.95
Kenwood TS-480SAT	£779.95
Icom ID-E880	£439.95
Yaesu FT-7900	£245.95
Icom IC-7000	£1189.95
LAMCO AT-5189	£149.95
Kenwood TH-7E	£239.95
LAMCO AT-588	£149.95
Icom IC-T70E	£163.95
Yaesu FT-857D	£673.95

facebook

LAM Communications Ltd

twitter

Lamcomms

PART EXCHANGE WITH LAMCO NOW

We offer the best part exchange deals which include free delivery and collection with FedEx

Kenwood TS-480SAT £779.95

Featured Products

Icom IC-7600 £3,299.95

Kenwood TS-590S £1,379.95

Yaesu FT-950 £1,314.95

Icom IC-7000 £1189.95

Kenwood TS-2000E £1,499.95

Yaesu FT-897D £776.95

Icom ID-E880 £439.95

Kenwood TS-480HX £879.95

Yaesu FT-857D £673.95

Icom IC-7200 £829.95

Kenwood TM-V71e £301.95

Yaesu FT-817ND £509.95 (free carry case)

Icom IC-E2820 D-STAR £699.95

Kenwood TM-D710e £449.95

FlexRadio 3000 £1,329.95

FlexRadio 1500 £599.95

WHAT'S NEW?

ICOM IC-9100
HF/VHF/UHF/SHF/D-STAR

ICOM IC-7410
HF/50Mhz

COMING SOON TO LAMCO

MANUFACTURERS

ICOM KENWOOD YAESU

CUSTOMER FEEDBACK

1. Excellent Service ! Ordered Thursday and delivered on Friday near Paris !!
2. Fast & Reliable service - Recommended! - Cheapest on the 'net!
3. great pieceof kit tnx ..excellent ,,LAM COMMS ROCK

FedEx. we ship all over the UK & EU

PayPal

E&OE

ebay find more brilliant buys in our ebay shop

LAM Communications Ltd. | 52 Sheffield Road | Hoyland Common | Barnsley | South Yorkshire | S74 0DQ | UK
Shop Opening Times - Mon to Fri : 0930 hrs - 1730 hrs
Sat : 0930 hrs - 1600 hrs

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

6 MARCH – BOURNEMOUTH RADIO SOCIETY 23rd ANNUAL SALE – Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth BH10 7LH. CP, OT 09.30-14.30, admission £1.50, TS, SIG, C, DF. Contact John, G0HAT, 07719 700771 [www.brswebsite.org.uk].

6 MARCH – 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.

12 MARCH – DUTCH NATIONAL RADIO FLEA MARKET – "Autotron", Rosmalen 's-Hertogenbosch, just off A59 motorway]. OT 0900 to 1530. TS, FM, €6. TI PI4SHB, 145.250MHz. Details +31 6 1356 1325, e-mail info@radiovlooienmarkt.nl [www.radiovlooienmarkt.nl].

13 MARCH – CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB RALLY – Wood Green Animal Shelter, King's Bush Farm, A1198 London Road, Godmanchester, Cambs PE29 2NH. OT 10:00 (09:45), £3, TI, TS, B&B, LB, C, DF, FAM, Contact John, G0GKP, 01954 200072, e-mail j.bonner@ntlworld.com. [www.cdarc.co.uk].

13 MARCH – 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, £2, B&B, CP, TI S22 (V44). Contact Chris, G0EYO, 07710 412 819, e-mail g0eyo@blueyonder.co.uk [www.wrcrally.co.uk].

19 MARCH – 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 – CALLINGTON AMATEUR RADIO SOCIETY RALLY – Due to circumstances beyond their control, Callington ARS have cancelled their rally for 20th March 2011. A new date will be announced soon.

20 MARCH – 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.

27 MARCH – SPRING MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AP. 10am, £2.50, civil, military and vintage radio equipment plus vehicle spares and more. Contact Rod Siebert, 01270 623353 or e-mail coldwatr@hackgreen.co.uk [www.hackgreen.co.uk].

3 APRIL – 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].

10 APRIL – CAMBRIDGESHIRE REPEATER GROUP ANNUAL RALLY – Foxton Village Hall, Hardman Road, Foxton, Cambridge CB22 6RN. TI S22, TS, B&B, C, DF, OT 10.00, £2. Contact Lawrence, M0LCM, 01223 654880, e-mail rally2011@cambridgerepeaters.net [www.cambridgerepeaters.net].

10 APRIL – NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION (Blackpool rally) – Norbreck Castle Exhibition Centre, Blackpool FY2 9AA. TI, CP, TS, B&B, SIG, MT, LB, C, DF, RSGB book stand. OT 10:45 /11:00. Dave, M0OBW, 01270 761 608, e-mail dwilson@btinternet.com [www.narsa.org.uk].

17 APRIL – ANDOVER RADIO AMATEUR CLUB BOOT SALE – Wildhern Village Hall and Playing Field, SP11 0JE, north of Andover just off the A343. TI S22, CP, £1.50, C, DF. Vendors £6 per boot/table, £8 inside the hall. Details Martin, M0MWS, 01980 612070 [www.arac.org.uk].

17 APRIL – WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park Racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. TI, free CP, OT 9.50/10.00. TS, FM, B&B, SIG, C, DF, WIN, LEC. Details Paul, M0CJX, 0845 165 0351, info@radiofairs.co.uk [www.radiofairs.co.uk].

17 APRIL – 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.loughernerradioclub.co.uk].

1 MAY – DAMBUSTERS HAMFEST – Thorpe Camp Visitor Centre, Coningsby, Lincs LN4 4PE. TI S22, GB3FR, £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. tcrm@hotmail.co.uk [www.qsl.net/gb4tcm/dambusters.html].

2 MAY (Bank Holiday Monday) – DARTMOOR RADIO RALLY – Tavistock College, Crowndale Rd, Tavistock, Devon, PL19 8DD. OT 1015/1030. TS, B&B, TI S22 (V44), CP, DF, C, FAM. Peter, M1AYI, 01822 860277.

22 MAY – MID ULSTER AMATEUR RADIO CLUB RALLY AND BOOT SALE – Drumgor Youth Centre, Drumgor Heights, Craigavon, BT65 4AP. OT 11am, CP, TI, B&B. [www.muarc.com].

5 JUNE – SPALDING & DARS ANNUAL RALLY – The Sir John Gleed Technology School, Halmer Gardens, Spalding, Lincs, PE11 2EF. TI S22 (V44), free CP. OT 10.00, TS, C, CBS. John, G4NBR, 0794 630 2815, Graham, G8NWC, 0794 776 4481, e-mail rally-secretary@sdars.org.uk [www.sdars.org.uk].

SILENT KEYS

We regret that for administrative reasons it has not been possible to include a list of Silent Keys this month. All notifications received will be published in a future *RadCom*.

5 JUNE – 15TH RED ROSE QRP FESTIVAL – Formby Hall, Alder Street, Atherton, Manchester M46 9EY. Free CP, DF, TS, SIG, B&B, C, LB, £2 (U14 free). Les Jackson, G4HZJ, 01942 870634, g4hzj@ntlworld.com [check www.wmrc.org.uk before travelling].

12 JUNE – 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].

12 JUNE – EAST SUFFOLK WIRELESS REVIVAL (Ipswich Radio Rally) – The Orwell Crossing Lorry Park, A14 Eastbound, Nacton, Ipswich, IP10 0DD. CBS, B&B, SIG, LRC, RSGB Bookstall, GB4SWR HF station, C, CP, TI S22. OT 9.30, £1. Contact Steve, M1ACB on 07711 329624 [www.eswr.org.uk].

19 JUNE – 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 – 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].

2 JULY – BANGOR AND DISTRICT ARS RALLY – Donaghadee Community Centre, County Down BT21 0HB. OT 12 noon, £2, TS, B&B, SIG. Bill GI4AAM 028 9181 6707, e-mail bill.langtry@btinternet.com [www.bdars.com].

This list shows all rallies and events we are aware of as at 3 February 2011. 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 MARCH 2011

Due to unforeseen circumstances, Ofcom has not been able to provide us with a listing of special event stations this month. We apologise for any inconvenience this may cause. If you are running a special event station in March and would like it included in GB2RS, please send details by e-mail to gb2rs@rsgb.org.uk.

10 JULY – CORNISH RAC 48th MOBILE RALLY – Penair School, Truro, Cornwall, TR1 1TN. TS, B&B, C, TI, CP. OT 10.30, £2. Details Steve, 01209844939 e-mail g7voh@btinternet.com. [www.cornishamateurradioclub.org.uk].

17 JULY – MCMICHAEL RALLY AND BOOT SALE – Reading Rugby Club, just off the A4 east of Reading. £2, TI, free CP, LB, C, SIG, WIN, TS, CBS. OT 9.30. Details Pete, G8FRC, 01189 695697, e-mail g8frc@radarc.org [www.McMichaelRally.org.uk].

17 JULY – 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 – HORNCASTLE SUMMER RALLY – Horncastle Youth Centre, Willow Road, Horncastle, Lincolnshire LN9 6DZ. 10.30, £1.50, DF, C. Tony, G3ZPU, 01507 527835.

7 AUGUST – KING'S LYNN ARC RALLY & CAR BOOT – Gaywood Community Centre, PE30 4DZ. OT 10.00, £1.50, TS, CBS, C, CS (by prior arrangement). Ray, G3RSV, 01553671307, e-mail ray-g3rsv@supanet.com [www.klarc.org.uk].

12 AUGUST – COCKENZIE & PORT SETON ARC 18th ANNUAL MINI-RALLY NIGHT – Community Centre, Main Hall, Port Seton. Bring along your own 'junk' and sell it yourself. Tables on first come first served basis. £2 for everyone. OT 18.30 to 21.30.

14 AUGUST – FLIGHT REFUELLING ARS HAMFEST – Mike, M0MJS, 01202 883 479, e-mail hamfest@frars.org.uk [www.frars.org.uk].

14 AUGUST – FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY – The Friskney Village Hall, Church Road, Friskney, Lincs. 6.5 miles south of Skegness. OT 10.00 to 14.30, £1.50, CP, C, WIN, TI S22, DIS. Details Bren, 2E0BDS, 01754 820 204, e-mail felcc@btinternet.com [www.felcc.webs.com].

4 SEPTEMBER – TELFORD HAMFEST – Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF 433.200MHz. TS, SIG, discounted admission to Enginuity Centre. Details from Martyn, G3UKV, 01952 255 416 [www.telfordhamfest.co.uk].

18 SEPTEMBER – 21st GREAT NORTHERN HAMFEST – Metrodome Leisure Complex, Barnsley S71 1AN. OT 11.00, DF, TS, SIG, LB, C, FAM. Details Ernie, G4LUE, 01226 716 339 [www.greatnorthernhamfest.co.uk].

7-9 OCTOBER – RSGB CONVENTION – Horwood House, Little Horwood, near Milton Keynes. Full convention programme with lectures for all interests and all levels of technicality [www.rsgb.org/rsgbconvention].

9 OCTOBER – AUTUMN MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, £2.50, civil, military and vintage radio equipment plus vehicle spares and more. Contact Rod Siebert, 01270 623 353 or e-mail coldwatr@hackgreen.co.uk [www.hackgreen.co.uk].

16 OCTOBER – HORNSEA AMATEUR RADIO CLUB RALLY – Floral Hall, 7 The Esplanade, Hornsea, East Yorks HU18 1NQ. OT 10.30, CP, TS, B&B, SIG, RSGB, RAFARS, LB, C, DF, WIN. Details from Rick, M0CZR e-mail R106221@aol.com or Duncan, G3TLI, e-mail g3tli@hotmail.co.uk [www.hornseaarc.co.uk].

23 OCTOBER – GALASHIELS AND DISTRICT ARS RADIO RALLY – The Volunteer Hall, St Johns Street, Galashiels, Scottish Borders TD1 3JX. OT 11.30 /11.15, £2.50. B&B, TS, C, WIN. Details from Jim, GM7LUN on 01896 850 245 or e-mail mail@gm7lun.co.uk.

6 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].

20 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.Bob Griffiths, G7HNB on 01752 3431277, e-mail freebobx@yahoo.com.

4 DECEMBER – 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 747497.

30 SEPTEMBER & 1 OCTOBER – NATIONAL HAMFEST – brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB Bookstall, RSGB Services & Committees, DF, FM [www.nationalhamfest.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.

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

YOUR FAVORITE DATA TERMINALS are still available PSK31-RTTY-WSJT-WSPR Etc Do you own a VIBROPLEX MORSE key. Its time it was fitted with my CABLETIDY. 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

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

AERIALS

WWW.PROANTENNAS.CO.UK Discrete, Effective 8 Band Aerials, the Rotary Dual Beam Pro & I-Pro Vertical, Buy Direct 01489 789960

M0CVO ANTENNAS HF, VHF and UHF antennas, fixed or portable. Full details at: http://www.m0cvoantennas.co.uk

PORTABLE 2M ANTENNAS from £24.95. The choice of experts. Ideal for SOTA! Details www.sotabeams.co.uk Telephone 01625-425700.

VORTEX ANTENNA SYSTEMS New UK mainstream antenna manufacturer and hardware supplier. Visit us online at www.vortexantennas.co.uk or 07943 871893

VORTEX ANTENNA SYSTEMS Delta Loops, Yagis. Monoband and multiband. For the home constructor - Antenna parts including 6082-T6 tubing, Stainless U-Bolts, Saddles, Mounting kits and much more. www.vortexantennas.co.uk or 07943 871893

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

CASH PAID For your unwanted/ faulty radio communications equipment, transceivers, amplifiers, receivers, mobile phones, subject to your description and our need. Local collection or your postage costs covered. Call Barncom 01248 360376 email gmbarnes@btinternet.com

FREE TRANSPORT TO FRIEDRICHSHAFEN SHOW I am going to the Ham Radio show in June and would like some company on the journey. You don't need to drive or make any contribution for fuel. If you fancy the trip, I will leave from Bedford 21/6 and return 28/6 and can pick up if needed. Contact John on 0778 981 7610

MISCELLANEOUS

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147KHz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.letsgonorth.co.uk/dunnet_head Email: briansparks@dunnethead.co.uk

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

PIRATES ON THE STARBOARD BOW!

Geoff Wooster, G3YVF

I hope at least the pirate using my call on 6m and 10m is putting out a good signal and well mannered! I can only be found on 160, 80 and 30m mainly on CW. It worries me a bit; the last pirates to come up here were the Dutch and they sacked Chatham Dockyard. As I live on St Marys Island in the River Medway, part of the Old Dockyard, I suppose I had better keep a good look out.

By the way, if you do work him, pass on my regards and then give him a broadside. Nicely.

ARE WE LETTING OURSELVES DOWN?

G1MQQ (MA (whingeing)

Yes and it may be too late.

Poor operating practice is not due to ignorance but arrogance, plus a fair bit of dumbing down. Having to give a callsign only every 15 minutes instead of every over makes it very easy to forget when it was last transmitted. I sometimes simply get fed up of waiting to hear who's on the air even when they are operating 'within the rules'. Operators who hog repeaters, particular frequencies or contest out of band know they're doing it. They don't care and there are always like-minded operators who take the same view so they will always find someone to talk to. 'Polite request', 'set an example' etc won't work.

The privileges and protocols associated with amateur radio will never be valued as long as licences are available to 8 year olds for free (and I am no way denigrating her achievement). Seasoned operators are not blameless. Some seem to think that they've been on the air so long they can claim squatters' rights and rewrite the rules.

Ray Howes, G4OWY

Clean up our act? It might happen, but probably won't. It is no surprise that over the past decade or so, operating standards have continued to slide year by year. But it must be mentioned of course that almost every country that has an amateur radio allocation is beset with the same dilemma – is there a convenient cure for all the current negative behaviour on the ham bands? If the past is any indication, an easy fix is looking unlikely.

Our General Manager asks why people jam and abuse over repeaters. The easy answer is "attention". The actual answer is much more complex. When you take a closer and dispassionate view of amateur radio and society in general, there is a disturbing parallel between them. Whether by design or sheer coincidence, Peter unwittingly casts a bright light over it: "gutter language" and "bad manners". These things in particular excite and are embraced by a large section of the populace – it is endemic. Not surprisingly, a slice of this populace will, by default, view our hobby with a different perspective than would otherwise be the case a couple of decades ago. Their agenda is not predicated merely on the love for amateur radio!

Once upon a time, our hobby was a 'scientific' pursuit. Not any more. Thankfully though, the more positive aspects of amateur radio still shine brightly, even if a growing minority are hell-bent on damaging our beloved hobby beyond repair.

I don't think that it is a very good idea to imply that "we" are all to blame for all the negative activity on the ham bands. "We" are not. So, "what can we do about it?" The reputation of amateur radio is at a crucial crossroads and, as such, I can't but look back over 50 years since I first got involved with it, and think that no amount of "New Year's resolutions" will counter the continuous onslaught by those who wish to take advantage of it simply to use it as some sort of band-aid to ease their psychological problems. But, on a positive note, "we" have to jealously guard our amateur radio privileges at all times – and, by doing so, "we" will ultimately and hopefully ensure that the fellowship of amateur radio will triumph over the common enemy of adversity – like it has for the past hundred years or so!

CAN YOU HELP?

Alan, G8HCJ

The picture in February Last Word is of an M/LW broadcast band aerial widely advertised in the Saturday editions of newspapers of the late 40s and early 50s. It was supposed to improve the reception, which it did by virtue of getting the aerial up higher.

I also remember at that time visiting Epsom Race Course on Derby Day, where traders were also selling 'Improved Aerials' - an electrolytic in a can! They were taken apart and unravelled to demonstrate the 'huge aerial' contained therein! Half-a-crown each, I seem to remember, and sales were very brisk!

EMC

Roger Bunney, G8ZZM

The growth of powerline networking is rapidly increasing, the latest Maplin list has three units suggesting up to 200m coverage.

Unless one lives in a field in the Highlands, EMC levels are now at intense levels in residential areas. I now have two BT Home Hubs and five other systems within range. The hiss and data 'pulsing' ranges from 1 to 30MHz.

Depressing!

IOTA CONTEST

Dimitrios Ciparissas, SV9MBH

In the February issue of *RadCom* the front cover showed my antennas on the roof of my building. The man on the tower is a good friend of mine and ham operator Vassilis, SW9OFH. It was the last tuning and adjusting of the antennas before the IOTA contest. I'd like to thank him for his help! I would also like to thank my good friend SV7/SA0BGI for his help with translating things into English for me.

HYBRID QSOS

Paul, EI5DI

Amateur Radio QSOs are, by definition, independent of all other communications technologies.

When a station is remote-controlled, the independence is lost. This was demonstrated during a presentation at the 2010 RSGB Convention when a remote-control QSO failed due to local broadband problems. Whatever was expected, it could not have been an amateur radio QSO, but rather some form of hybrid communications.

Hybrid QSOs are not amateur-radio QSOs, just as hybrid cars are not electric cars.

OPTICAL VOICE TRANSMISSION

Colin, G3SBI

I was interested to see the article in February's *RadCom* on optical communications. In 1973 at Daresbury Laboratory I had built a prototype light link to be used for control in high voltage DC accelerators The prototype electronics used free space optical links and digital time division multiplexing, the transmission rate being 5Mbit/s using double frequency code. The prototype equipment was destined to go in the Harwell Tandem to see if the techniques to protect the electronics would work when you had a high voltage tank spark (they did).

The actual Science Research Council was meeting at Daresbury one evening. As a demo we set up two optical links with a telephone handset at each end. We also showed that the link could control a power supply at the same time as providing a speech channel. It proved a very popular demonstration.

In the light link transmitter the diode was pulsed by the double frequency code so it could not be used directly for analogue transmission. I designed a system using RS Components plastic fibre system to communicate across the high voltage boundary to the Ion Source. In this system the transmit diode was biased to half current so you could transmit digital or analogue signals. The analogue path had a bandwidth from 25Hz to 8MHz and was for use with CCTV cameras. If you wanted to play radio, narrow band SSB could be used across this path centred at any frequency in its bandwidth. This is the sort of thing you would have to design in a free space optical link for modulation of the link for SSB or CW signals.

There is a useful tip in terminating the plastic fibre when using the RS Components ferrule. The plastic fibre is cut to project a short distance in front of the ferrule. A cigarette lighter is used to melt the plastic, which goes into a mushroom shape. This prevents the fibre being pulled out of the ferrule and increases the coupling between the diode and the fibre.

RadCom Technical Editor Giles Read, G1MFG comments: We start a major article on optical communications this month that also covers some of this ground.

PRAISE FOR OFCOM

Colin, G4SXR

In the Amesbury area near Stonehenge I have had a strong signal on the 2m band. The signal sounded like a mains hum; this signal had been around for some months and stopped my enjoyment of the repeater section of 2m. Other amateurs in the area also had the same problem.

On 12 December 2010, I used the abuse/complaint form on the Ofcom website to inform them of my problem.

I received a telephone call from Ofcom on 16 December to ask for more details and also to tell me that one of their field engineers would call me.

After the Christmas and New Year holidays I was contacted by Richard Beere, a field engineer, to arrange an appointment. This was arranged for 13 January at 1100hrs.

As arranged, Richard came and heard the interference for himself. After spending about an hour with me, and giving me a demonstration of his very sophisticated tracking equipment, he left to track down the interference. Within the hour he telephoned to say he had found the property from where the interference was coming from. He had arranged an appointment with the householder for the next day.

He duly returned to the property on 14 January. At 1330hrs Richard called in person informing me that he had found and cured the problem. He asked me to check to confirm that the interference had gone. The band was nice and quiet.

The problem was caused by an old and redundant analogue TV amplifier, which for some reason was still powered up.

Three cheers for Ofcom: less than one month from complaint to it being solved. That was including the Christmas and New Year holidays. Special thanks to Richard Beere, Ofcom field engineer.

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk. Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right not to publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Additional letters may be published on the RSGB members-only website at www.rsgb.org/membersonly/lastword.

USING MY CALLSIGN

Dave H, G0CER / KJ4QAO

I was contacted last week by about six Americans who had someone using my call contacting them to sell them radios and asking for money to be sent via Western Union – one poor guy sent $500 and another $150. I have contacted Western Union and they have asked for anyone who received requests for money to forward those e-mails to them.

This sounded like they might block the user – but apparently a phone number OR an e-mail address can be used – and I guess the scammer will just move to someone else's ID.

I would ask you to tell people to not put too much identification detail on their QRZ pages – and if buying anything, be very careful.

REMOTE INTERNET COMMUNICATIONS

Sam, G4UQB

I was pleased to see my letter published in the January 2011 edition and subsequent responses from Carl, G1BSI and John, G3WKL in February.

John's closing paragraph may be the logical way to go – if a signal is heard emanating from station, say: OE3xyz, then that is the callsign that is predominant for the QSO to make sense. And then if used remotely, it could be further qualified, by the operator's own call in a 'secondary' light, say: KC9xyz. Immediately, everyone in the rest of the world will know 'exactly' from where the signal is coming and the 'usefulness' of exchanging technical details, apart from just a ragchew. As I understand it, amateur radio is first and foremost a technical hobby – not just about communicating, per se.

While one is a technical hobby and all that, that implies: band plans, construction, research, rallies, antennas, junk sales, hamfests, field days and the like – the other really is (no bad thing in itself) just communicating, *per se*; especially in my case where the KC9xyz station, operating remotely through OE3xyz, only needed a computer, microphone and a good telephone line – something getting closer perhaps to an internet chatroom?

Amateur radio uses the 'wireless' medium of communication – not telephone wires, which kills the 'hobby' stone dead.

WHERE ARE YOU?

The RSGB replies

The callsign data published in the *RSGB Yearbook* every year are the official licence records held by Ofcom. Unfortunately a fallacy seems to have grown that the RSGB actively suppresses the records where they are marked 'details withheld'. The truth is that where licence records are marked 'details withheld' Ofcom only supplies the callsigns to the RSGB. So if details are withheld the RSGB has no address information that it could release or any idea of where someone might reside.

The callsign data that is published in the *RSGB Yearbook* is strictly controlled by the Ofcom and its data protection statements. The important item to note within this is that the amateur radio licence application contains the following wording:

Do you consent to your name and mailing address being published in a callsign book? Yes or No?

This is extremely specific and the only purpose for which Ofcom will release the address data to organisations such as the RSGB. The RSGB therefore does not make any changes to the callsign data supplied by Ofcom. Individuals can though change from 'details withheld' easily, by making licence amendments either online at the Ofcom website or by post. It cannot however be done by the RSGB. The RSGB does believe that radio amateurs should release their mailing data for the benefit of the wider amateur radio community and would therefore urge those who have withheld their details to release these, unless there is a good reason why they should not.

It can also noted, that the Data Protection Act would also make it an offence for us to release any address data we may hold, such as *RadCom* mailing address, etc without the express permission of those involved. Whilst we used to make changes to the RSGB Yearbook, the requirement to obtain and correlate the permissions needed, along with a variety of other reasons, have made this impractical today.

WATERS & STANTON

Orderline
01702 206835

Diamond
HF Antennas

W-735

Compact 80/40m dipole. Just 26m long. Internal ATU handles it with ease. A great way to get on these two bands.

£109.95 D

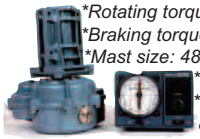
Terminated Folded Dipole. 2 - 30MHz 150W. Low SWR over whole range.

WD-330S Just 10m long yet covers the major HF spectrum. An internal ATU will easily handle this coax fed ant. **£239.95 D**

WD-330 25m long & will give good performance for its size. It covers all ham bands from 80m - 10m. Again, an internal ATU will handle it with ease. **£249.95 D**

Create
Rotators

RC5-1 Medium Duty Rotator



**Rotating torque: 6kg/m*
**Braking torque: 80kg/m*
**Mast size: 48-63mm*
**Vertical load 400kg*
**Horizontal load 800kg*
Rotation speed: 60-150sec/50Hz *Power: 230V AC 80VA *Weight: 5kg *Cable: 7-core cable (not supplied) *Requires MC-2 lower mast clamp if mounting on pole* **£569.95 D

RC5-3 **£699.95 D**
Same as above but with preset control.

We stock a full range of HyGain, Yaesu & Create rotators @ www.wsplc.com

bhi
DSP Audio

NEW NES10-2MK3

Speaker and programmable DSP unit. Offers dramatic noise reduction. **£109.95 C**

NEIM-1031MKII **£139.95 C**
Noise Eliminating In-Line Module.

NEDSP1061-KBD **£99.95 C**
Noise Eliminating DSP module for FT-817

NEDSP1062-KBD **£104.95 C**
Noise Eliminating DSP module for speaker.

ANEM-MKII **£124.95 C**
In-Line "Noise Away" amplified DSP module.

DSPKR **£154.95 C**
Noise Eliminating DSP Ext. Speaker 10W.

NOISE-AWAY **£154.95 C**
Amplified DSP Noise Cancelling Desk Speaker.

RADIOMATE **£89.95 C**
Compact keypad for Yaesu FT-817/857/897.

CAT-MATE **£49.95 C**
Electronic Y Splitter for Yaesu CAT Interface.

DV-Dongle 2 Models!

DV-DONGLE USB to your PC or Mac and work D-Star by accessing internet open D-Star repeaters worldwide. **£169.95 C**

NEW DV-ACCESS Access Point, similar to above but able to TX/Rx over short distance so that with 2m D-Star radio you can work through your PC. **£209.95 C**

Tonna
VHF/UHF Antennas

220505 **£118.95 D**
6m 5 element 10.1dBi gain 3.45m long

220809 **£79.95 D**
2m 9 element 13.1dBi gain 3.47m long

220909 **£74.95 D**
70cm 9 element 13dBi gain 1.24m long

220919 **£94.95 D**
70cm 19 element 16.2dBi gain 2.82m long

220623 **£77.95 D**
23cm 23 element 17.9dBi gain 1.75m long

220725 **£102.95 D**
13cm 25 element 18.3dBi gain 1.45m long

Buddipole
Portable HF Antennas

The most respected portable HF antenna system available. Available as a dipole or vertical system - packs down into a carry pack.

The secret of the system is the hi-q coil assemblies.

www.buddipole.com

W3-BP Dipole 40-2m 250W **£219.95 D**
W3-BP-DELUXE With mast kit **£419.95 D**
W3-BS Vertical 40-2m **£161.95 D**
W3-BS-DELUXE Vertical + clamps **£194.95 D**
W3-CTA Centre T mast clamp **£8.95 A**
W3-DKB Buddipole Carry Bag **£41.95 C**
W3-LBVK Low band vertical kit **£199.95 D**
W3-MBP Mini Buddipole **£239.95 D**
W3-MK Mounting Kit **£36.95 D**
W3-MWA-4 Military whips **£102.95 C**
W3-RAK Rotate arm kit **£39.95 C**

MFJ
Field Strength Meters

MFJ-801

Great for measuring RF levels & tuning antennas, particularly mobile and portable.

MFJ-801 is a compact hand-held model that covers 100kHz - 500MHz. **£32.95 A**

MFJ-802 has a larger meter and emplys a telescopic dipole to reduce affects of stray reflections **£55.95 A**

Diamond
Duplexers

These high quality units enable you to feed the output of 2 RF devices to 1 or 2 antennas from one device.

MX-62M This has 2 inputs, one for HF and the other for 6m - UHF and has 1 output. **£77.95 C**

MX-610 This has 2 inputs, one for HF & 6m and the other VHF-UHF, and has one output. **£79.95 C**

Watson
Power Supplies

Power-Mite-NF

Compact Cont. 22 Amp Switch Mode PSU variable voltage & noise offset.

£71.95 C

Power-Max-25-NF

Slightly larger than the Power-Mite and ideal companion for any 100W radio.

£89.95 C

Power-Max-45-NF

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset.

£129.95 C

Power-Max-65-NF

65 Amp Low Noise power supply. Patented Noise Control that permits you to move any noise away from the operating frequency.

£239.95 D

For More Bargains - CLICK IT!

eBay

Go to www.wsplc.com then click on the link to our ebay shop.

Samlex
Power Supplies

SEC-1212

Switch mode PSU offers 10A of cont. current output & 12A peak. Ideal for low power, designed with RF in mind, it is totally noise free & utterly stable. ** Input 230V AC * Output 13.8V DC * Output current 10A cont (12A peak) * HF & VHF filtering* **£81.95 C**

SEC-1223 23A Cont S/Mode **£99.95 C**
SEC-1235 30A Cont S/Mode **£149.95 C**

DCI
Hi-Q VHF Bandpass Filters

Incredibly well designed bandpass filters for VHF & UHF with high attenuation outside ham bands.

DCI-145-2H 2m **£219.95 C**
DCI-145/435 2m & 70cms **£339.95 C**
DCI-435-10C 70cms **£259.95 C**

If you are wanting to squeeze the best possible signals out of your receiving set-up and avoid problems from strong out of band signals - this is the answer.

Avair
Power SWR Meters

Great Value Superb Performance!

All models have 12V backlight and include DC Cable.

AV-201 **£49.95 C**
1.8-160MHz, 5/20/200/1kW

AV-400 **£49.95 C**
140-525MHz 5/20/200/400W

AV-601 **£69.95 C**
1.8-160MHz / 140-525MHz

AV-1000 **£79.95 C**
1.8-160MHz, 430-450MHz, 800-930MHz, 1240-1300MHz. 5W, 20W, 200W, 400W.

Cross Needle Models - Even Lower Prices!

AV-20 **£39.95 C**
30W / 200W, 3.5-150MHz

AV-40 **£39.95 C**
15W, 0-150W, 144-470MHz

Watson
Dummy Loads

They feature high tolerance, air-cooled housings with extremely efficient heat ducting. This results in a realistic continuous power rating, together with an impressive VSWR curve.

DM-150PL **£34.95 C**
DC-1GHz PL-259 30W cont 100W 90 secs

DM-200N **£49.95 C**
DC-3GHz N-Type 35W cont 100W 2 mins

MFJ
RF Current Meters

If you are using an end fed wire, the only true way to make sure it is matched correctly is to adjust for max current flowing through the wire with an RF Current Meter.

All cover 1.8 - 30MHz

MFJ-834 0.3, 1 & 3 Amps **£85.95 C**
MFJ-834H 3, 10 & Amps **£92.95 C**
MFJ-835 Bal. line Xneedle 0.3-3A **£131.95 C**
MFJ-836 Combined VSWR & Ampmeter using cross needles 03., 1 & 3A **£141.95 C**
MFJ-836H As above but 3, 10 &30A **£152.95 C**

Miracle Antennas
Miracle-Whip

A tuneable telescopic whip covering 3.5 to 460MHz. Up to 25 Watts PEP, fiited with PL-259 plug. Great for FT-817 & IC-703 or any other QRP radio.

£122.95 C

Ducker **£112.95 C**
HF Mini ATU for helical whips

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

UK's Lowest Prices!

www.wsplc.com www.jayceecoms.com

Hi-Tech Department for Hams & Commercial Customers **W&S are pleased to be sole distributors for AOR & TenTec products in UK & Ireland**

AOR

AR-8200-MKIII

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

£469.95 D

AR-MINI

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

£159.95 D

W&S are now approved suppliers to UK Government Departments

AR-ONE

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

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

£4499.95 D

AR-5001D

NEW

This new receiver is widely regarded as one of the best for spectrum monitoring & follows in the foot steps of the AR-5000

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

£3395.95 D

AR-8600MKII Base or Portable

Base or portable station receiver covering 530kHz - 3GHz. All modes AM FM FMW & SSB with standard rotary tuning. Requires external 12V or optional internal batt pack. A great station accessory for general listening or extra receiver.

£669.95 D

TEN-TEC

Are You Driving A Sports Car?

Traditional ham radio equipment is comfortable, predictable and reliable. It gives you what you have learnt to expect and what most others drive. So meet TenTec, the "sports car" of the ham radio world that puts you right on the front of the grid! Move up a gear to real performance, speed of operation and breathtaking response. Big clear displays, ultra quiet reception, superb sensitivity & a front end that handles anything you can throw at it. Enjoy the power of a tough 100 Watt transmit section with audio that sets your signal ahead of the pack or throttle back right down to 5 Watts. The Ham Radio sports car is available now in four models.

Jupiter-538B

100W SSB CW AM FM 160m - 10m

Get a new experience in performance and innovation under the bonnet. 160m - 10m with 100 Watts output. The classic TenTec radio - it can even decode CW on the screen and send CW via a PC keyboard.

£1529 D **With internal ATU £1839**

Omni-VII-588

100W SSB CW AM FM 160m - 6m

Fire it up and you immediately know you are driving something different. The receiver is a delight and the transmitted audio is superb. Connect d to your home router with ethernet cable and you can remotely operate from anywhere in the world.

£2549 D **With internal ATU £2849**

Orion-II-566

100W SSB CW AM FM 160m - 10m

You get two hot receivers. You get the latest colour screen and superb roofing filters. plus new control processor. DSP means you get a receive section that is the envy of others. It's simply TenTec's best!

£3969 D **With internal ATU £4249**

NEW Eagle-599

The Eagle has landed. 160m-6m. A new design rom TenTec. small enough for portable or mobile with 3 IFs - the last being 0kHz DSP. We have just got the first batch of this exciting radio. It's TenTec's newest and has been getting rave reviews.

£1734 D

Check out: www.hf-transceivers.com

FlexRadio Systems®
Software Defined Radios

The Cutting Edge of Ham Radio

Whichever Way You Look At It - FlexRadio Is The Future!

The Mighty Flex-5000A!

The SDR-5000 is the most advanced transceiver ever built by Flex-Radio Systems. Not only does it have an amazing front end, it can also accomodate an additional fully independent receiver and a VHF-UHF transverter.

£2495.95 D

Flex-5000A-ATU includes a built-in automatic ATU. **£2795 D**

Flex-3000 100 Watts!!!

100Watts (down to approx1 Watt) of SSB, CW, FM and AM. About the size of a laptop! It is the go anywhere transceiver of today. This software defined radio offers cutting edge performance that takes advantage of the very latest technology. Built-in auto ATU.

HF - 6m 100 Watts Base or LapTop Companion & Built-in Auto ATU

£1299.95 D

Brief Specifications:

160 - 6m / 1-100 Watts / 1Hz frequency steps / Firewire connection / Yaesu modular mic input / Tx unwanted SSB suppression 65dB / Tx 3rd order IMD -31dB / Rx typical sensitivity -0.3uV / Rx MDS (pre-amp off -121dB / IP3 better than +26dBm / IMD 95dB @ 2kHz / SSB selectivity 2.39/2.54 kHz (6dB/60dB) / Selctivity variable down to 50Hz / Power 13.8V 25 Amp peak (1.5 Amp receiver).

What Else Gives You So Much For So Little?

Flex-1500

£579.95 D

A single USB cable connects to your PC (or Mac with BootCamp). Switch on, boot up and you enter the world of SDR. Razor sharp variable filters, Panoramic live display, All modes and wideband receiver, and a new adventure BEGINS!!

- ***160m - 6m All Modes Transceiver***
- ***5 Watts Of Clean RF Power***
- ***USB Connection***
- ***Selectivity To 25Hz!***
- ***Use With Laptop For Easy Portable***

Buying a Flex-1500?

When you look at what you get for your money, the Flex-1500 makes a lot of sense. **And until March we are offering a FREE Heil adaptor lead of your choice plus a CD full of extras!** What else gives you so much for so little? And yes - We even offer part exchange deals - Yes! - even on dead radios! Phone or Email us

FlexRadio is so simple to install and get going. Just slip in the PC Windows software disc provided (or download latest version) and follow the instructions. Connect your FlexRadio to a 13.8V source and run the supplied USB or firewire cable to your PC. Fire up the software and you are ready to go! The industy's best panoramic display, with instant "click-tune" on a signal for fast contest style operation. Enjoy 25Hz "no=ring" selectivity for CW or adjust both Rx and Tx bandwidth for that distincive SSB signal. There are hundreds of parameters you can adjust and store to make the radio personal to you. **This is ham radio HF at its cutting edge!**

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

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 4.30pm

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

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0345 2300 599
(Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

YAESU

Peter Hart reviewed the Perseus SDR Receiver and proclaimed to have found a new No.1 in receiver performance. The crown given to Perseus was short lived. The new FTdx5000 grabs the position, ahead of the Perseus SDR, Elecraft K3, Flex-5000, in that order.

The FTdx5000 has landed at the World's Favourite Hamstore. To get a valuation on the very best HF transceiver available today, call 01932 567 333 and get a trade-in value on your current kit or the very best outright buy. Either way, you just know you will be buying this important landmark in Japanese engineering from a company that understands and supports HF DX Amateur Radio.

FT-DX5000 HF BASE TRANSCEIVER

For more information see: www.FTdx5000.com or see our YouTube channel, search MLandSshop.

ML&S are very proud to announce they are a Major Sponsor of the 5-Star DX'er Association's forthcoming T32C Kiritimati Christmas Island DX-Pedition during 2011. For further information see: www.t32c.com

Customer Comments from Geoff G3CYL

Thanks for the fantastic service Martin. Phoned order for my FT2000D and MFJ AATU at 1000 yesterday. Firmware upgrade, no-quibble trade-in and delivery to home by 1800. Must be a record. Not surprising that ML&S is the top ham radio dealer in the UK. 73 Geoff.

YAESU FT-897D

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

ML&S: £759.95

FT-897D with AT-897Plus Auto ATU £924.95

NEW FT-450D

Following on the success for the FT-450 original, the FT-450D has many improvements and comes fitted with the Auto ATU as standard.

- ✓ 400MHz built-in IF
- ✓ Built-in Electronic Keyer
- ✓ LCD Multi-function Display
- ✓ Bar-Graph Metering
- ✓ Built-in TCXO ± 1 PPM/hour (after warm-up)
- ✓ AGC Fast-Slow-Auto-Off Selection
- ✓ Clarifier adjustment
- ✓ Built in Antenna Tuning System
- ✓ Classically Designed Knobs
- ✓ Included Dynamic hand mic
- ✓ Dedicated Data Jack for FSK-RTTY-CTCSS
- ✓ User configurable functions
- ✓ Digital voice announcement of frequency, mode and S-meter
- ✓ 500 Regular Memories and Two voice memories
- ✓ CW Beacon function
- ✓ 10kHz Roofing Filter
- ✓ Key Illumination
- ✓ Foot Stand
- ✓ 500 & 300 Hz CW Filters

Available now for only £729.95 or less – CALL!

FT-950 HF BASE TRANSCEIVER

A "proper size" HF/6m Base Station offering 100W output on all bands, built-in PSU. With ML&S throwing in a FREE MD-100 desk microphone worth £139.95, there isn't a better time to buy.

FT-2000 100W £1999.95

The DX choice of 3B7C.
Always in stock. Always on demo.

FT-2000D 200W VERSION AVAILABLE AT £2699.95

YAESU FT-857D & ATAS-120A PACKAGE

160m-70cm HF Base/Mobile. Still our best selling HF Mobile Radio.

FT-857D only £669.95 or with ATAS-120A £919.95

YAESU FTM-350E

Latest Dual-Band APRS Mobile from Yaesu!

ONLY £469.95!

NEW YAESU VX-8DE

With Enhanced APRS

£359.95

Triple Band 6/2/70 APRS enhanced version of the VX-8E. Due to user requests Yaesu has extended some capabilities of the fantastic handheld in respect of APRS functions. All other functions remain unchanged, the same accessories are used.

VX-8GE

2/70cm version of the VX-8DE. Fitted GPS, dedicated to APRS on 2/70.

Only £349.95

Yaesu FT-817ND. ML&S £559.95
Still the only truly hand-portable 160m - 70cm all mode transceiver available today.

Yaesu VX-3E. ML&S £159.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60R. ML&S £179.94
Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £234.94
Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £289.95
The UKs best selling Triple Band Handie.

FT-7900 with FREE YSK7800. £239.95

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

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

FT-2900. NEW! Replacement for FT-2800. MiL spec, high performance. £134.95

Yaesu FTM-10R. ML&S £269.95

Yaesu FT-8800. ML&S £329.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

Yaesu FT-8900. ML&S £379.95
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!

Yaesu FT-897D.
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W) Bundle Price: £CALL (Rig only: £776.12)

Yaesu FT-857D. The Ultimate HF Mobile Installation! Plus ATAS-120D 40m-70cm Auto Antenna.
Bundle Price: £939.95 (Rig only: £673.98)

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