

RadCom

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



JULY 2012
VOLUME 88
NUMBER 07

£4.75



IOTA Contest

Where will you be for the 2012 contest?

0
7
1
2

EME 2012

A weekend on Earth Moon
Earth communications



GR100MGY

Commemorating the life
of the Titanic's Chief RO



Homebrew

A new Pinguino dev board
plus amp health monitoring



Wavecom W-Code

Powerful signal analysis &
decoding software reviewed



WATERS & STANTON

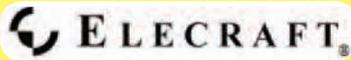
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P3
Panoramic Display



KPA-500
Linear 500W 160-6m



KX-3
160-6m 10W Transceiver

We are now stocking some of the top models from Elecraft including K3 transceiver, 500W linear amplifier and Panoramic display.

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For Full Details Turn To Inside Back Cover Of This RadCom

West Mountain RADIO RigBlaster-PRO



USB and serial port. Superior DC and RF isolation with high grade audio transformers. Record both sides of a QSO, process audio in real-time, or even join an EchoLink using your own radio microphone. The RigBlaster also provides true FSK, serial port CW

keying, a wide range of CAT/CV rig control options. Front panel control for transmit levels. Dual RCA jacks for direct footswitch, or external sequencer. **£269.95 C**

Exclusive UK Resellers

InnoAntennas

Builders of the Biggest and Best HF Array!

These Antennas will "outperform" anything else that you have of a similar size. They will also reduce many noise problems. Come and visit us and the designer, G0KSC, at the World EME Conference in Cambridge, 16-18th August - see: www.eme2012.com

The "LFA" Secret! The LFA is a major advancement in the development of the Yagi in recent years. The rectangular loop laid flat on the boom provides out-of-phase sections towards the element tips.

- 3-LFA-144 3 element 8.67dBi gain **£59.95 C**
 - 4-LFA-144 4 element 9.49dBi gain **£74.95 C**
 - 5-LFA-144 5 element 11.16dBi gain **£89.95 C**
 - 6-LFA-144 6 element 11.88dBi gain **£104.95 C**
 - 8-LFA-144 8 element 13.32dBi gain **£164.95 C**
 - 9-LFA-144 9 element 14.06dBi gain **£194.95 C**
 - 10-LFA-144 10 el. 14.73dBi gain **£227.95 C**
 - 12-LFA-144 12 el. 15.80dBi gain **£269.95 C**
- See The Full InnoAntennas Range @ wsplc.com



- 3-50-LFA 3 el. 50MHz 8.9dB gain 20dB F/B Boom 2.14m **£119.95**
- 2-LFA-28 2 el. 10m 6.4dB gain 13.5dB F/B Boom 1.28m **£159.95**

Big or small, HF or UHF, or Exposed locations: we can provide an antenna that does the job and has a guaranteed performance. All the gain, F/B, and side lobe specifications are proven, not generated in the advertising department! If you want performance and an antenna that lasts, look no further than Essex! That's the new world centre for antenna excellence.

HF - UHF in One Box!



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

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



KENWOOD



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

ICOM IC-7000

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



HF on a BUDGET!



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



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



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



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



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

HF High Performance Transceivers



FT-950 HF & 6m Transceiver



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

FT-2000 160 - 6m Transceiver

This radio is a DXers favourite and widely used for DXpeditions and contests. Covering 160m to 6m. It has all the digital features and auto ATU. Available as 100 Watt or 200 Watt version. **IN STOCK 100W £2259 D 200W £2899 D**



FT-DX5000 160 - 6m Transceiver

The current Yaesu "flagship" radio, covering 160m to 6m delivering 200 Watts. **ALL IN STOCK**
FT-DX5000 Standard radio **£4635.95 D**
FT-DX5000D + SM-5000 monitor **£4939.95 D**
FT-DX5000MP + monitor & filters **£5369.95 D**

KENWOOD TS-590S

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



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

ICOM IC-7410

HF-6m Transceiver

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



IC-7600 HF Transceiver

The IC-7600 HF/50MHz transceiver is enhanced with some of the main features tried tested on the flagship IC-7700/7800 models. It is highly regarded by Amateur operators world-wide. Features inc a double conversion superheterodyne system, dual DSP units & 3kHz IF (roofing) filter. **IN STOCK £3299.95 D**



IC-7700 HF Transceiver

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



OMNI-VII-588 HF Transceiver



Fire it up and you immediately know you are driving something different. The receiver is a delight and the transmitted audio is superb. This 100 Watt transceiver that covers 160m - 6m. Ethernet remote control ready. **IN STOCK £2699.95 D**

NEW PRODUCTS COMING SOON!

There's more to come! Keep in touch by visiting our web pages www.wsplc.com

Yaesu FT-DX3000 160-2m All modes & a great full colour screen



Heil ProSet-3 Studio Headphones



TenTec Argonaut-VI SSB CW 10W Carrying on the fine QRP tradition.



Yaesu FT-1DE Digital & FM



Super Antennas YP-3 Ultra Portable Yagi 20-10m



Elecraft Signal Source Calibrated 1uv & 50uv 160-2m



SuperAntennas PM-1 40-70cms



Be kept informed of all these & more together with prices & availability, email us at info@wsplc.com or phone 01702 203353 to be put on our data base - don't miss out!

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HF Linear Amplifiers

Alpin-100mkII 160m - 6m 1.3kW

New Low Price



The Alpin 100 desktop linear will deliver up to 1.3kW output from this desktop design. It covers 160m - 6m and has full tune up protection. The panel control display tells you exactly what is happening and makes operation simple. If you are looking for something rugged with full safety features at a sensible price - this is it! **£2299.95 D**

AMERITRON AL-811XCE 160m - 10m 600W



This Ameritron design gives a sensible power gain for a very reasonable price. It has a hunky built-in power supply with full monitoring of operation conditions. It uses three low cost 811A tubes to achieve 600W power output running from a 1500volt HT line. This desktop design can easily be accommodated. 350 x 210mm Weight: 14.51kg **£899.95 D**

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

AirNav Systems



RadarBox-Pro **Price Reduction! Save £100!**

We've lowered the price of the **RadarBox-Pro** by £100! If you've always wanted to try the RadarBox now is the time to do it! See real aircraft on your computer screen just like on a real radar.

~~£399.95~~ **£299.95 C**

RadarBox-3D **£489.95 C**

See real aircraft on your computer screen with Google Earth 3D.

VHF UHF Mobiles

NEW TM-281E 2m FM 65/25W Mobile **£169.95 D**

On or off the road, Kenwood's TM-281E is a mobile you can count on. This MIL-STD compliant transceiver delivers powerful performance, excellent audio clarity, and a host of advanced features.

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



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



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



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



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



FTM-350E 2m/70cm Mobile Bluetooth GPS APRS **£479.95 D**



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



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

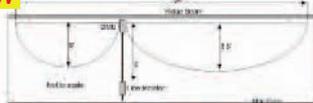


TM-V71E 2m/70cm Mobile with Echo Link **£299.95 D**



Radio Works NEW 34ft Attic Antenna

NEW



Here's a great idea for those with a small garden or no garden! The attic is a smart alternative. It's dry, put of the wind and rain, and probably higher than you can erect an outside antenna. The above shows the antenna strung across the ridge of the roof. Coverage is 40-6m (inc WARC bands), and many internal ATUs can match it. Includes balun matching unit and antenna isolator. Ready built to go. Great value.

- CW-COMPACT-40** Folded back el. 40-6m 1500W. min height 25ft inc balun & isolator. **£139.95 D**
- SHORT-40** 40-6m 1500W 50ft long inc balun and isolator **£134.95 D**
- CW-COMPACT-80** Folded back el. 80-6m 1500W 69ft inc balun and isolator **£149.95 D**
- CWS-80** Carolina Windom Special 80-6m 1500W 66ft long inc balun and isolator **£139.95 D**
- CW-40** Carolina Windom 40-6m 1500W 66ft long inc balun and isolator **£121.95 D**
- SHORT-160-SPECIAL** 160-6m 1500W 100ft long inc balun and isolator **£147.95 D**
- SHORT-80** 80-6m 1500W 100ft long inc balun and isolator **£146.95 D**

Handheld Transceivers



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

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



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



VX-6E 2m/70cms handy, 5W Wideband Receive **£249.95 C**



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



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



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



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



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



IC-E90 Triple band 2m 6m 70cm + wideband receive 500kHz-1GHz **£244.95 D**



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



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



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



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

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



HB-1B QRP Transceiver

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

IN STOCK £249.95 D

WATSON

Made for Watson by MOCVO Antennas

NEW



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

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



W-LINE 1:1 Line Isolator **400W 1.8-30MHz** Removes RF from Coax. **£32.95 C**



1:1, 4:1-BALUN & 9:1-UNUN 400W 1.8-30MHz Can be used as centre feed point. Each model **£32.95 C**

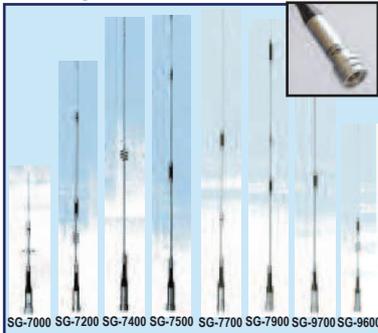
- MD-12HP** 12m Mono for portable fixed station 400W CW 1:1 Balun 5.77m **£43.95 C**
- MD-17HP** 17m Mono for portable fixed station 400W CW 1:1 Balun 7.95m **£43.95 C**
- LW-20** Multiband HF long wire 9:1 UNUN 80-6m inc WARC 20m long 400W **£43.95 C**
- LW-10** Multiband HF long wire 9:1 UNUN 40-6m inc WARC 10m long 400W **£43.95 C**
- HW-80HP** Multiband HF off-centre dipole 4:1 balun 80-10m 40m long 400W **£71.95 C**

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



DIAMOND ANTENNA

Engineered To Perform



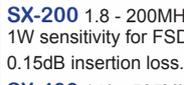
NEW LOW PRICES From UK Distributors!

Diamond VSWR Meters

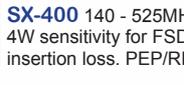


SX-100 HF 3kW
1.6 - 60MHz
30/300/3kW FSD. 3W
sensitivity for FSD.

Single sensor 0.1dB insertion loss. PEP/RMS
£99.95 C



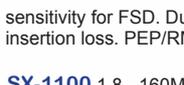
SX-200 1.8 - 200MHz. 5/20/200W FSD.
1W sensitivity for FSD. Single sensor.
0.15dB insertion loss. PEP/RMS **£94.95 C**



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



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



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

Diamond Power Supplies



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

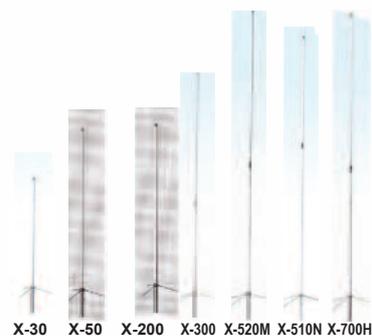


GZV-6000 60A
GZV-4000 40A
GZV-6000 60 Amps continuous 1 - 15VDC
variable 210 x 110 x 3300 mm inc. DC
cooling fan, weight 5.2kg **£349.95 C**



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

Base VHF/UHF Antennas



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

FlexRadio Systems® Software Defined Radios

Waters & Stanton First To Get Their Hands On A Flex-6000!



Main picture: Klaus (European Service), Gerald Youngblood, the president and designer, and Jeff Stanton.



Waters & Stanton were invited to the USA presentation of the new Flex-6000 series. A new major development in SDR technology. Production begins in October on this new high end design. Centred around a completely new software system, to be known as SmartSDR, performance will be transformed. Digital rx processing will now take place at the antenna socket. We hope to have the first UK Demonstration at Newark Show. Full details on our web site.

Flex-3000 160-6m 100 Watts Auto ATU

94dB dynamic range. 96kHz wide receiver display. Firewire connection. Built-in auto ATU, 100 Watts and weighs just 3.2kg. The FLEX-3000 is the high performance mid-range 100 watt all-band, all-mode amateur radio transceiver that achieves receiver performance that rivals all other traditional analog hybrid DSP transceivers in its price class. The FLEX-3000 is the perfect transceiver for hams just getting started with high performance software defined radios or a companion SDR for existing FLEX-5000 owners who want a more convenient solution for portable operation. **£1379.95 D**



Flex-1500 160-6m 5 Watts USB cable

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



Hygain Vertical Antennas

AV-6160 6-160m aerial 43 feet self supporting 1500 Watts **£434.95 D**
AV-6110 160/80m high efficiency matching network **£279.95 D**
AV-12AVQ 10-15-20m Vertical 1.5kW 13ft **£169.95 D**
AV-14AVQ 10-15-20-40m Vertical 1.5kW 18ft **£209.95 D**
AV-14RMQ Roof mount kit : baseplate/mast & radials **£109.95 D**
AV-18AVQ11 10-15-20-40-80m vertical 1.5kW 18' **£279.95 D**
AV-18HT 10-12-15-20-40-80m Vertical 1.5kW 53ft **£1,089.95 D**
AV-18HTJR 10-15-20-40-80m 5kW Vertical 39ft **£399.95 D**
AV-18VS 10-12-15-17-20-30-40-80m vertical 1.5kW 18' **£134.95 D**
AV-620 6-20m Vertical inc WARC 1.5kW, 22.5' long **£329.95 D**
AV-640 6-40m Vertical inc WARC 1.5kW 25.5' long **£479.95 D**
DX-77A 10-12-15-17-20-30-40m vertical 1.5kW 29' **£479.95 D**
DX-88 10-12-15-17-20-30-40-80m Vertical 1.5kW 25' **£409.95 D**
KIT-160-88 160m add on kit for DX-88 **£209.95 D**
GRK-88 Ground radial system for DX-88 **£109.95 D**
RRK-88 Roof radial system for DX-88 **£109.95 D**
LC-160Q 160m mod kit for AV-18HT 150 W **£124.95 D**
MK-160A 160m mod kit for AV-18HT 1 KW **£135.95 D**
MK-6 6m add-on kit for most HF yagis & rotatable dipoles **£49.95 C**
MK-17 17m add-on kit for AV-14AVQ **£99.95 D**
MK-80 80m add-on kit for AV-14AVQ **£94.95 D**



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

HF Verticals

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

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

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

SD330

80-6m Remote Tuned Whip
This "screwdriver" design covers all the DX bands (inc WARC0). Continuously tuned with supplied remote control, it will handle 200W and is just 1.85m long. Fitted 3/8" stud mount, it will easily fit onto a 3-way magnetic roof mount. **£429.95 D**

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

RadCom

THE RADIO SOCIETY
OF GREAT BRITAIN'S
MEMBERS' MAGAZINE

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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!)

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



The Five Star DXers Association saw some beautiful sights on its T32C DXpedition to Kiritimati Island.

Photo: EI5DI.

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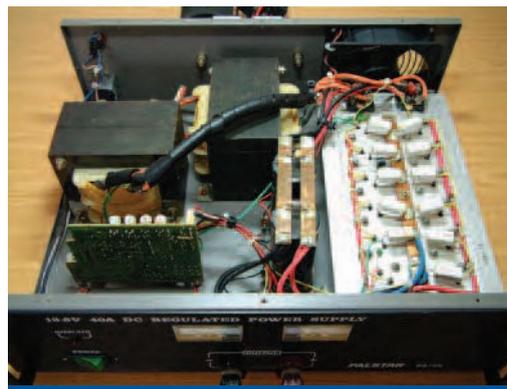
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RADIO SOCIETY OF GREAT BRITAIN

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.

RSGB MEMBERSHIP

Annual rates from 1 January 2011

Full membership (by Direct Debit) £47.00

(individual & club)

Family membership (by Direct Debit) £56.00

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

Student (21-25) Free

Ham Club (under 21) Free

Subscriptions include VAT where applicable.

Special arrangements exist for visually impaired persons.

Details and membership application forms are available from RSGB HQ or see www.rsgb.org/join.

YOUR RSGB

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

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

Chairmen and Honorary Officers:

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

General Manager:

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

Honorary Treasurer (Acting):

Richard Horton, G4AOJ, e-mail: g4aoj@rsgb.org.uk

Company Secretary:

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

THE RSGB INTERIM BOARD

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

Dave Wilson, MOOBW (President),
e-mail: m0obw@rsgb.org.uk

Dr Bob Whelan, G3PJT (Board Chairman),
e-mail: g3pjt@rsgb.org.uk

Don Beattie, G3BJ (Acting General Manager),
e-mail: g3bj@rsgb.org.uk

Phillip Brooks, G4NZQ, e-mail: g4nzq@rsgb.org.uk

Dr Chris Duckling, G3SVL, e-mail: g3svl@rsgb.org.uk

Dr John Gould, G3WKL, e-mail: g3wkl@rsgb.org.uk

Alan Messenger, G0TLK, e-mail: g0tlk@rsgb.org.uk

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

REGIONAL MANAGERS

Region 1 – L Paget, GM00NX, e-mail: rm1@rsgb.org.uk

Region 2 – D Morrison, GM1BAN, e-mail: rm2@rsgb.org.uk

Region 3 – K A Wilson, M1CNY, e-mail: rm3@rsgb.org.uk

Region 4 – H Scrivens, G0UGE, e-mail: rm4@rsgb.org.uk

Region 5 – V Ravenscroft, M0VRR, e-mail: rm5@rsgb.org.uk

Region 6 – M Harper, MW1MDH, e-mail: rm6@rsgb.org.uk

Region 7 – J Sneddon, MW0EQL, e-mail: rm7@rsgb.org.uk

Region 8 – P Lowrie, M15JYK, e-mail: rm8@rsgb.org.uk

Region 9 – A Johnston, G8ROG, e-mail: rm9@rsgb.org.uk

Region 10 – G Keegan, G6DGK, e-mail: rm10@rsgb.org.uk

Region 11 – P Helliwell, G7SME, e-mail: rm11@rsgb.org.uk

Region 12 – M Sanderson, M0IEO, e-mail: rm12@rsgb.org.uk

Region 13 – J Stevenson, G0EJQ, e-mail: rm13@rsgb.org.uk

SPECIALIST AREAS - CHAIRMEN & HONORARY OFFICERS

Abuse and poor operating

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

Amateur Radio Direction Finding

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

Contests

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

EMC

John Rogers, M0JAV, Chairman, EMC Committee, e-mail: emc.chairman@rsgb.org.uk, www.rsgb.org/emc/

General Technical Matters

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

General Spectrum & Regulatory Matters

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

GB2RS News Service Management

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

HF matters

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

Intruders to the Amateur Bands

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

IOTA Activity Programme

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

Microwave matters

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

Planning Advice

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

Propagation Studies

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

Repeater and Data Communications

John McCullagh, G14BWM, Chairman, ETCC, e-mail: etcc.chairman@rsgb.org.uk, www.ukrepeater.net

RSGB Awards

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

Training & Education

Steve Hartley, G0FUW, Chairman, Training & Education Committee, e-mail: tec.chair@rsgb.org.uk, www.rsgb.org/clubsandtraining/

VHF matters

Terry Stevens, G8DKS, VHF Manager, e-mail: vhf.manager@rsgb.org.uk

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

HEADQUARTERS STAFF

General Amateur Radio Issues

Carlos Eavis, G0AKI
E-mail: AR.dept@rsgb.org.uk
Telephone: 01234 832 700, Option 5

Amateur Radio Examinations

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

RadCom (news items, feature submissions, etc)

Elaine Richards, G4LFM or Giles Read, G1MFG
E-mail: radcom@rsgb.org.uk
Telephone: 01234 832 700, Option 3

GB2RS and Club News

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

Sales department

(membership, books and other products)

E-mail: sales@rsgb.org.uk
Telephone: 01234 832 700, Option 1

Subscription renewals

Telephone: 01234 832 700, Option 2

IOTA

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

General Manager

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

HEADQUARTERS AND REGISTERED OFFICE

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

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

PLAY YOUR PART IN YOUR RSGB

Have Your Say

Let us know how we're doing! Through "Have Your Say" you can let us know your views and you will receive a reply from the General Manager or a Board Member.

Write to haveyoursay@rsgb.org.uk or go to www.rsgb.org/haveyoursay

Consultations

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

National Radio Centre

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

Licensing & Special Event Stations

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

FAQs

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

Band plan

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

Good Operating Practice

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

RSGB Tech

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

RSGB Shop

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

Club finder

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

WEBSITE

Main website: www.rsgb.org

Members Area: www.rsgb.org/membersonly

Log in using your callsign in lower case as the user name and your membership number, without the leading zeros (see your RadCom address label) as the password.

If you need to update your membership details, please visit www.rsgb.org/amend.

Building on a strong foundation



It is both an honour and a privilege to be given the opportunity to serve the Society as its General Manager at this important time in its history.

I come to the job from a

background of health services management, both here in the NHS and in South Africa. Throughout my career, my job has been to help organisations move forward and change and I look forward to working with the Board and you, the Members, in the challenging times ahead.

A busy professional life has left me little time for hobbies, but my love of amateur radio has been with me since my teens. I consider myself to be an 'average' radio amateur. By that I mean

- I have always had a 'barefoot' station: 100W and wire antennas.
- I dabble in contests. I have my share of 'certificate wallpaper' but I am never going to win anything serious and that does not deter me. Contesting for me is trying to

beat my own scores (ie working towards the best I can be).

- I am active on CW, SSB and datamodes on HF.
- I will chase DX, but not obsessively – if I don't get the rare one, there will always be another time.
- In the past I have been a Worked All Britain fan and I will be participating in that programme as time permits.

Recently, I have been a reader for the RAIBC – the charity working for amateurs with disabilities. I have a strong commitment to working for others less fortunate and I believe that this sense of community is one of the many values that defines us as radio amateurs.

Perhaps unsurprisingly, I am a firm believer in the importance of the RSGB. It is easy to take the RSGB for granted and I am not sure that everyone understands exactly what goes on behind the scenes to protect and develop our hobby. I am convinced, however, that we would all be the worse for not having an effective national society.

Last year, the EGM endorsed the need for the Society to change and the President gave his vision of the future of the Society, part of which was the need for the Board and HQ to be more responsive to the membership. The Board and I need your

ideas and views as well as the opportunity to involve you in our planning to shape the future. Please contact me at any time if you feel that your voice is not being heard. Using *Have Your Say* (www.rsgb.org/haveyoursay) will always reach me.

There has never been a better time to promote and expand our hobby and the RSGB. Next year we are 100 years old, a cause for celebration. Also, the new National Radio Centre at Bletchley Park provides a unique focus for UK radio communication, both past and future. Part of my job is to ensure we increase our membership (not least because all radio amateurs benefit from our activities) and you will hear much from me in the coming months about how that is going.

I am very conscious that I can do little without the help and support of the Board, the HQ staff and the cohort of members who so generously volunteer to donate their time and expertise to the Society. I shall never take this for granted. May I end by highlighting the work of one volunteer – Don Beattie – who, as Acting General Manager, has laid a strong foundation on which I will build.

Graham Coomber, GONBI
RSGB General Manager

RCF agreement with ATC



The Radio Communications Foundation is pleased to announce that agreement has

been reached with the Air Cadets Organisation (ACO) to accept a pass in their ACO Radio Communications Foundation Equivalent (FE) examination as equivalent to a pass in the Foundation Radio Amateur examination. Ofcom has also accepted that the ACO FE examination syllabus meets the Radio Amateur Foundation level requirements and will issue a Radio Amateur Foundation level licence via the Radio Society of Great Britain (RSGB), on receipt of a successful Air Cadet candidate pass details.

The Foundation understands that the RSGB is offering those under 21 who achieve their licence through this route a year's free membership of the Society. In keeping with existing RSGB policy, this free membership can be renewed on an annual basis until the age of 21 (25 for those in full time education). The vision of the Foundation is to bring the benefits of radio to young people and to encourage the use of technology. The Foundation is delighted with this agreement as it completely meets this objective and it is inspiring that young Air Cadets may set out on a lifetime of enjoyment of the hobby through this agreement.

Calcutta Key Presentation



The Calcutta Key was awarded at the recent AGM to Ken Pulfer, VE3PU, for his work

on behalf of IARU with ITU. As Ken was unable to attend the AGM, Bryan, VE3QN (right) presented Ken, VE3PU with his award at the recent annual Spouses Night dinner meeting of the National Capital Chapter of the Quarter Century Wireless Association.

Garden Party

The RSGB President, Dave Wilson, MOOBW was accompanied to the Queen's Garden Party by his wife, Kath, M1CNY, Jim Stevenson, G0EJQ (Regional Manager Region 13) and Jim's wife, Georgina. They were delighted to have the opportunity to speak to the Duke of Edinburgh, the patron of the RSGB.

CONGRATULATIONS

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

70 years

Mr C L Chappell RS5272

60 years

Mr F G Blain	G3JLN
Mr S A Gaunt	G3PXJ
Mr P O Hooper	G3KSP
Mr D M Mallett	G3HUL
Mr N R Pascoe	G3IOI
Mr K Wallace	G3LQW

60 years

Mr R G Bailey	G3WCQ
Mr R E Collins	G3ROC
Mr P E Lavender	G3RAN
Mr D K McDermott	E14DW
Mr L G Sear	G3PPT
Rev J A Wardle	G4CVA

ERRATA

Last month's article on IF filters using Ceramic Resonators has prompted a Technical Feedback article on P86.

In the news on the 85th AGM Awards we inadvertently gave an incorrect callsign. Paul Marsh is MORYT. Our apologies for the error.

Foundation & Intermediate Licence Holders Operating Club Stations

A club station can only be operated by a club member with a Full licence. Other UK licence holders (including Foundation & Intermediate) are permitted to operate the station under the supervision of a member who is a Full licence holder – supervision means being in the same room and able to stop any operation outside the licence conditions.

Non-licensed members can only send greetings messages under supervision of a member who is a Full licence holder (ie the

Full licence holder at the controls, the non-licensed person on the mic only), *unless* they are on a recognised training course, in which case they can actually operate the radio under supervision of a member who is a Full licence holder. That can be over a prolonged period, not just a single contact to tick the box on the Foundation record.

In every case above, the Full licence conditions apply, so 400W is OK, where the licence allows it.

If a Foundation or Intermediate licence holder uses the club station *without* supervision they *must* use their own callsign and limit their operation to their own licence conditions (ie 10 or 50W, as appropriate).

To be absolutely clear, a club call does *not* allow Foundation or Intermediate licence holders to operate with the Full licence conditions unless they are supervised by a Full licensed member.

Please remind your club members.

HF noise measuring campaign

At a recent Propagation Studies Committee meeting, the RSGB Board representative was explaining the board's viewpoint and asking what the committee can do for the membership. To be honest we already do quite a bit, eg provide HF Propagation Predictions in *RadCom*, on the RSGB's website and on GB2RS News. We also write *RadCom* articles from time to time as well as give lectures to those club's that request one. Another activity requiring time and effort is the attendance at various rallies up and down the country.

At the meeting, the question of background noise arose, which affects all radio users. One of our members has been measuring his for

the last couple of years; this was considered to be not only informative but also interesting. As a result, I have started my own measuring scheme at my QTH. It occurred to me that this could perhaps provide a way in which the amateurs of this country could participate in a worthwhile project. Because of the diverse set of equipment and aerials in use throughout the amateur community, this will not be a terribly scientific campaign but will show a trend. The aim is to not only provide those participating with the knowledge of their own circumstance as far as background noise levels are concerned, but to eventually provide the necessary agencies with sufficient evidence

so that a more scientific campaign may be launched, if necessary.

I am proposing that those participating measure (at their own QTH) the background noise on the bands 1.8MHz to 28MHz once per month, for perhaps 2 to 3 years. The requirement would be that the level (in S-points) be noted in a spreadsheet (which we supply) and, if using an SDR Rx, the dBm figure as well. A requirement would be that the same radio and aerial setup be utilised for the whole campaign.

Those interested should contact Gwyn Williams, G4FKH, QTHR, e-mail g4fkh@btinternet.com, for more information and a copy of the spreadsheet.

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 J B Colderwood, 2E0BML
- Mr T C Willis, 2E0CJQ
- Mr J Clark, 2E0JPC
- Mr S Culshaw, 2E0SCU
- Mr J Hayes, 2I0BAD
- Mr B W Cousins, 2I0TWA
- Mr K Jackson, AA3XV
- Mr C Whitlock, AA4YL
- Mr G Zehr, AA9LC
- Mr J J Reiser, AD1C
- Mr P Rivera, AF6RW
- Mr M Obermann, AG9A
- Mr R Wirthlin, AJ4BI
- Mr L Rainford, EI7DSB
- Mr Legoupil, F4GEQ
- Mr J O'Malley, G00JG
- Mr L Hunter, G1RUN
- Mr A Gilmore, G1ZHD
- UK Microwave Group, G3EEZ
- Mr S Spencer, G3ILO
- Mr A Gordon, G4BCT
- Mr A Shelbourne, G4TJJ
- Tiverton SW ARC, G4TSW
- Mr C Holdford, G7KXZ

- Mr I D Maughan, G7LET
- Mr R Young, G7RNQ
- Mr M Furber, G7TEM
- Mr J M Beene, G7VAE
- Mr M R Keightley, G8BLK
- Mr C West-Bulford, G8JXU
- Mr A Arnold, G8NPH
- Mr P W Fineron, GM8PEB
- Mr R Marchese, K1NOK
- Mr J Wilber, K1SPY
- Mr D Niles, K2PMC
- Mr W E Berbit, K2UW
- Mr J Farler, K4AVX
- Mr R C Jaeger, K4IQJ
- Mr R Malone, K4SSM
- Mr D Anderson, K4SV
- Mr R Baker, K5LLF
- Mr D Divendorf, K6KR
- Mr R Arland, K7SZ
- Mr M J Bottema, K8EX
- Mr N Yoshida, K9DIG
- Mr R Sokola, K9RS
- Mr R E Williamson, KB1TTF
- Mr D Felton, KB3X
- Mr F Gruber, KB7NJV
- Mr M Goodsmith, KC0TYE
- Mr R Solimeno, KC2JAV
- Mr J Jesson, KC2V6L
- Mr T M Oliver, KC8QFF
- Mr M Watts, KC8WDP
- Mr R Huntingdon, KC9RLS

- Rev J Wheeler, KC9VDI
- Mr C Rice, KD4SS
- Mr G Atkinson, KD8GQM
- Mrs B Crumb, KD8KIO
- Mr R Klug, KE0A
- Mr H Smith, KE6TI
- Mr D Goffinet, KE8DO
- Mr G Mistic, KE8RN
- Mr J Brandenburg, KF5ZDY
- Mr R Citronberg, KI4GHT
- Mr K Johnson, KK7P
- Mr G L Mager, KN4GC
- Mr T Koffel, KZ8ZZ
- Mr V Puodziunas, LY2BOS
- East Yorkshire Emergency Communications Group, M0GYR
- Mr J Pelham, M0HBX
- Mr M Pavall, M0HCH
- Mr A WOJCIK, M0IOY
- Mr A Keys, M1HAR
- Mr J T Gregory, M3NGM
- Mr K Jeffery, M6BQW
- Mr S Plummer, M6BRH
- Mr B D A Ager, M6BRZ
- Mr K Blackhorse-Hull, M6DAX
- Mr D Filby, M6DCR
- Mr G Willard, M6EAK
- Mr R Poulson, M6JKQ
- Mr K Sharpe, M6KAN
- Mr K H White, M6KHW
- Mr N Humby, M6KJV

- Mr S Morris, M6SPM
- Mr E Nieuwoudt, M6ZAL
- Mr C Craig, MMOMRU
- Mr S McCallum, MM6KMO
- Mr T W Shaffer, NOHWY
- Mr F Howat, N2FH
- Mr T Frobase, N3LLL
- Mr M H Goad, N4HCO
- Mr G Roberts, N4HFW
- Mr D Schumacker, N5FVM
- Mr J Comer, N8BI
- Mr J Planalp, N8JAY
- Mr S Kritard, N8WB
- Mr T Holmes, N8ZM
- Mr D Belt, NA4VY
- Mr R Sherwood, NC0B
- Mr F J Russo, NF1Y
- Mr J Vicens, NP4G
- Mr N Vizcarrondo, NP4H
- Mr M B Chrispin, PY5MC
- Mr D K Askew, RS203798
- Mr D Simpson, RS209131
- Mr C J H Andrew, RS209267
- Mr R E R Rumbold, RS209322
- Mr D S James, RS210345
- Mr J Mirfield, RS210381
- Mr G Nicholls, RS210544
- Mr M Mutkin, RS210549
- Mr Morris, RS210561
- Mr K Stowe, RS210583
- Mr W White, RS210587

- Mr G P Shepherd, RS210591
- Mr M Saleh, RS210599
- Mr P Punjabi, RS210600
- Mr L C Money, RS210619
- Mr J D Atkinson, RS210622
- Miss P Pennywise, RS210623
- Mr R W Greer, RS210654
- Mr W N Skidmore, RS210669
- Mr S Wheelton, RS210704
- Mr G Frisholm, RS210705
- Mr N Silvers, RS210720
- Mr A Parsons, RS210809
- Mr B Dinc, TA7W
- Mr S Bertuzzo, VA3SB
- Mr B Crook, VE3CRG
- Mr R Ferch, VE3KI
- Mr J G Johnson, VE3KID
- Mr K M Zuvic B, VP8ALJ
- Mr T Delano, W1CC
- Mr J Luhn, W5A00
- Mr N A Gunn, W8IFF
- Mr F Fusaci, W8KA
- Mr M Mohler, W9MBU
- Mr L D Yates, WA4PMA
- Mr S Weister, WB2REI
- Mr N Gholson, WB4YBY
- Mr R Shaw, WB6RHF
- Mr M Haack, WB9B
- Mr T J Preston, WB9KFH
- Mr E Herson, WF8E
- Mr R Harkett, ZL2FY

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

- Mr D A Bambrook, 2E0DAB
- Mr R Baines, 2E0FFS
- Mr M Isaacs, 2E0GBR
- Mr C Collins, 2E0KXD
- Mr H Yiannakis, 2E0TPZ

- Mr J Vann Smith, 2E0VMZ
- Mr M R Khalid, AP2RF
- Mr G A Harris, G0MKI
- Mr B T Ham, G0NPV
- Mr P G Marriott, G0RUD
- Mr V F Webb, G3REN
- Mr R Steed, G3YUJ
- Dr G C Carney, G4DRZ
- Mr A Mallows, G4FUZ
- Mr J Brown, G4JGL

- Mr B T Thomas, G4KGU
- Mr J W Jarvis, G4NEY
- Mr R Brown, G4QA
- Mr D J Rainer, G4VTQ
- Mr R Suckling, G6MVN
- Mr J R Mountain, G6YDN
- Mr G A Pemberton, G7NEH
- Mr I Bodie, G8END
- Mr E M Gawthorpe, G8FEK
- Lady J Johnson, G8YYL

- Mr J Kellaway, GW3CBA
- Mr A J Jones, GW4VPX
- Mr G A Donovan, GW8BNL
- Mr M Korona, HB9EGA
- Mr F Henrikson, KLOSW
- Mr I N Solly, MOCAG
- Mr J O Shea, MOJSO
- Mr A J Mears, M0TEC
- Mr A Smith, M0VKG
- Mr T Woods, M1BDH

- Mr G Temple, M1CDU
- Mr R A Kennedy-Bright, M1DQG
- Mr W A Wailes, M1FIV
- Mr L Kelly, M3VHV
- Mr S Marko Tapani, OH3AD
- Mr I Talbot, RS198903
- Mr J M Timson, RS87530
- Mr R Greenburg, W2CYK



The Rig Guide

Edited by Steve White, G3ZVW

The Rig Guide is one of the most popular books published by the RSGB as there is nothing else quite like it. This fully updated and revised edition simply defines the prices of amateur radio equipment in the UK.

Planning to buy or sell any amateur radio equipment? You should not be without *The Rig Guide*. If you want to know what the trade in price is for your existing kit or how much it will fetch as a second hand item, this book provides it along with current retail prices too. The guide isn't just limited to popular commercial amateur radio transceivers but also covers receivers, scanners and linear amplifiers too. You'll find extensive lists of past models from Alinco, Yaesu, Icom, TenTec and Kenwood and many others and so we're not just talking about current models either. There is a section on DSP equipment and, for the first time, there is a section covering the Chinese manufacturers. There are full reviews that include handhelds from Icom & Wouxun and the Flex-1500. Overall *The Rig Guide* contains details of over 300 pieces of equipment covering HF, VHF & UHF. Each is described in an easy to understand listing that covers its main features, band coverage etc with a photograph and details of its RadCom review (a full list of RadCom reviews since 1990 is also included). There are also tips for buyers and a guide to selling and trading and the guide even tells you how to avoid getting lumbered with stolen gear.



You can easily recoup the cost of *The Rig Guide* with your very first purchase or sale by simply knowing how much you ought to pay for an item (or sell) – the other person probably has a copy, so why be at a disadvantage? Buy a copy today!

Size: 210x297mm, 96 pages ISBN 9781-9050-8680-1

Price £5.99 & Free P&P



RSGB Centenary 2013

With the RSGB Centenary now just over 6 months away, detailed planning is underway of events to mark the occasion, as well as to publicise our hobby to the public. Our outline plans suggest that this is quite a large task and the Board is pleased to announce the appointment of Rob Harwood, GOHRT (e-mail centenary@rsgb.org.uk) to chair a Centenary Working Group to lead the work.

VACANCY NOTICE. Rob Harwood, GOHRT is looking for a few volunteers to join the Centenary Working Group to help plan and implement a number of events to celebrate the Society's Centenary next year. The scope for the events is still under consideration, but it is likely to include a yearlong sequence of themed Special Event Stations, local events with clubs, and events to both publicise the hobby to our national and international partners as well as highlight the supporting role that Society plays.

Rob is seeking a few volunteers from our membership who can think creatively, work mostly virtually, and have the necessary skills and self-motivation to drive the ideas forward to implementation. A description of the role and an invitation to apply is on the RSGB Volunteer Vacancies web page, www.rsgb.org/volunteers/?vacancy=centenary-working-group. Please contact Rob along with a brief CV and interests by e-mail to Centenary@rsgb.org.uk.

RSGB enjoys success at Dayton Hamvention

In May, the RSGB President, along with two staff members, once again represented the Society at the Dayton Hamvention, something the Society has been doing for around 20 years. Reflecting on three long hard days, the President is pleased to confirm that commercially the event was a success with the costs of our attendance being more than covered by the recruitment of 80 new members, along with some 34 membership renewals and the sale of getting on for £8,000 worth of books.

Of equal importance, but not so readily measurable, was the opportunity to attend and influence a range of international discussion and meetings in which the voice of the RSGB is both respected and welcomed.

The President and the Society hope for a similar outcome at the forthcoming Friedrichshafen HamRadio 2012, which is the other international event attended by representatives of the Society.

The following amateurs visited the RSGB stand at Dayton 2012.



AA3XV/G4NGJ	HZ1GW/ GWORIC	KB1TTF	KI4YDG	Nancy Silvers	W8HC
AA4YL	K0EUV	KB2VMG	KK4BDE	NFLY	W8IFF/G8IFF
AA8SU	K1BG	KB3LZK	KK6AW	NP4H	W8MOJ
AA9LC	K1NOK	KB7NJV	KK7P	NP4G	W8MWT
AB1QP	K1OYB	KB9PDN	KLOSW	NS3Q	W8OP
AB8GG	K2PMC	KC0G	KN4GC/ G4ZDW	PAOTRT	W8TJK
AC8EB	K2UV	KC0TYE	KZ8ZZ	SM5ENX	W8WG
AC8FJ	K3WJL	KC0YAS	MOCFW/ JK3GAD	SM5LNE	W9JRW
AC8KB	K4AVX	KC2JAV	MOJCI	VA3SB	W9MBM
AD1C	K4JWA	KC2VGL	MOTDG	VA7AM	W9SAN
AJ4BI	K4QE	KC8QFF	MOZAF	VE3CRG	W9SWW
AJ4FM	K4QQK	KC8VOB	M1KTA	VE3EMJ	W9TOC
AK9N	K4SSM	KC9EAA	M5IAN	VE3JG	W9WLI
EI2FG	K4SV	KC9KMV	NOHWY	VE3KI	W9XAN
GOENW	K4XC/KH6	KC9RLS	N2FH	VE3KID	WA2BHB
G2KQ	K5HLZ	KC9VDI	N2MH	VE3KKB	WA2VYA
G2YL	K5LLF	KD0EAG	N2SS	VE3ND	WA4PMA
G3LHZ	K6BK	KD4SS	N3GQ	VE3SXB	WA6YOW
G3NID	K7EUG	KD8GQM	N3LL	VE4MAW	WB2KHO
G3NUG	K7SZ/ G5CSU	KD8LDC	N4FN/GONBJ	VE7XPK	WB2REI
G3VLH	K8EX	KD8LPQ	N4HCO	VU3BGI	WB2TRI
G3ZAY	K8GT	KD8OXJ	N5FVM	W0IVJ	WB4YBV
G4CLF	K8RKS	KE0A	N8BI	W1CC	WB6RHF
G4GXL	K9DIG	KE6TI	N8GFO	W1JR	WB8OQT
G4HPW	K9ES	KE8DO	N8JAY	W1NHRS	WB9ARJ
G4TGP	K9RS	KE8RN	N8T	W3RFC	WB9B
G5KC	KA0HMQ	KF5IDY	N8WB	W4PH	WB9FTW
G8EDH	KA0STD	KG4IBI	N8ZM	W5A00	WB9KFH
G8YEV	KA8IMZ	KG7FBD/ G7FBU	N9GKE	W5DID	WD9EWW
GD6IA	KA8IMZ	KI4GHT	N8ZM	W5JCS	WF8E
GM3WIL	KA8IMZ	KI4MWP	N9GKE	W6TRB	WJ1B
GM4DLG			NA4VY	W8DXX	ZL2FY

QSL Matters

IS YOUR CONTACT INFORMATION CORRECT? Last month, we urged all multiple call holders, especially M3/6, 2 and MO call holders to use the 'amend my details' link on the RSGB website, or to call HQ to confirm both current and any past callsigns, for QSL purposes. Thank you to those who have already done so, but some calls are still not recognised. Many Clubs still need to tell us both their primary callsign plus others held and used less frequently.

To use the bureau, NOV holders of GB and Contest, single letter calls, either personal or affiliated club, must now provide membership details. We are now asking all members to add their membership number to each collection envelope, next to their callsign.

RETURNING CARDS. Uncollected cards will

now be recycled after 3 months and not returned, for cost and environmental reasons. In this connection – does your QRZ.com page say you collect when you don't? As a courtesy, Silent Key cards will, where possible, continue to be returned to the sender.

The bureau aims to promote *Responsible QSLing*. Recently we mentioned OQRS, a system to request a card from the other station, before sending yours. More and more people are using this great idea. To see how you can add it to your web presence and get free software, check out, www.DF3CB.com.

MORE ON IRCS. The Post Office may no longer sell IRC's but Tom, GM4DM points out that they still honour them, at a value of 87p. Tim, MOURX tells us he has IRCS available if you need them. Gordon, G3USR

reputedly has lots in stock as many QSL managers regularly receive IRCs on behalf of their users, helping to defray the cost of outgoing cards for DX operators.

OLYMPIC TORCH RELAY. Worked All Britain has confirmed that QSL cards are not required to claim the Olympic Torch relay awards. WAB request logs claims only. Full details at www.worked-all-britain.co.uk.

SUB MANAGER CHANGE GOT SERIES. Long-time sub-manager Derek Gilbert, GONFA stepped down recently due to a forthcoming operation. I'm sure all members will wish him well again very soon. We are grateful to his replacement John, GOTQT, for stepping in. Details are on the RSGB website under 'Operating'.

Proposed Changes to the 144MHz Data Band Plan

The popularity of Digital Internet Gateways has been evidenced over the past year by a significant increase in proposals for Gateways

in the 2m band. The ETCC Datacomms Manager has been studying current use of the data section of the 144MHz band and has

concluded that improved use of this spectrum could be achieved if a number of changes were adopted.

The current data band plan is shown in the table below:

Frequency (MHz)	Bandwidth	Usage
144.8000	12kHz	Unconnected nets - APRS, UiView, etc
144.8250	12kHz	Internet Voice Gateway
144.8375	12kHz	Internet Voice Gateway
144.8500	12kHz	AX.25 BBS user access
144.8625	12kHz	Available for nodes and BBSs on application
144.8750	12kHz	TCP/IP user access
144.8875	12kHz	AX.25 - Priority for DX Cluster user access
144.9000	12kHz	AX.25 DX Cluster access
144.9250	12kHz	TCP/IP user access
144.9500	12kHz	AX.25 BBS user access
144.9750	12kHz	High speed 25kHz channel
145.2125	12kHz	Internet Voice Gateway
145.2375	12kHz	Internet Voice Gateway
145.2875	12kHz	Internet Voice Gateway
145.3000	12kHz	RTTY local
145.3375	12kHz	Internet Voice Gateway

The proposed new data plan is as follows with accompanying explanatory notes:

Frequency (MHz)	Bandwidth	Usage
144.8000	12.5kHz	Unconnected nets - APRS, UiView, etc
144.8250	12.5kHz	Internet Voice Gateway DV Gateways
144.8375	12.5kHz	Internet Voice Gateway DV Gateways
144.8500	12.5kHz	Internet Voice Gateway DV Gateways
144.8625	12.5kHz	Internet Voice Gateway DV Gateways
144.8750	12.5kHz	Internet Voice Gateway DV Gateways
144.8875	12.5kHz	AX.25 - Priority for DX Cluster user access
144.9000	12.5kHz	AX.25 DX Cluster access
144.9125	12.5kHz	TCP/IP user access
144.9250	12.5kHz	TCP/IP user access
144.9375	12.5kHz	AX.25 BBS user access
144.9500	12.5kHz	AX.25 BBS user access
144.9625	12.5kHz	Internet Voice Gateway Analogue
144.9750	25.0kHz	High speed 25kHz channel
145.2125	12.5kHz	Internet Voice Gateway Analogue
145.2375	12.5kHz	Internet Voice Gateway Analogue
145.2875	12.5kHz	Internet Voice Gateway Analogue
145.3000	12.5kHz	RTTY local
145.3375	12.5kHz	Internet Voice Gateway Analogue

Existing channels between 144.900-144.975MHz, although designated 12.5kHz channels, have been retained as 25kHz channels, dating back to about 1996. By making them true 12.5kHz channels additional allocations can be added at 144.9125 and 144.9375MHz. A number of the packet radio designated channels would be moved from the 144.800-144.900MHz sub-band to the new channels further up the band.

As may be seen, this reassignment frees up channels for additional DV Internet Gateways, some of which have already been using 144.8625 and 144.875. With the IARU band plan not permitting DV gateways in the 145.200-145.5935MHz section, the existing five DV hotspots would move from that sub-band to the 144.825-144.875

sub-band. In some cases this will be achieved by swapping them with existing analogue gateways.

Applicants can currently no longer apply for analogue gateways on 144.825 or 144.8375MHz, and it is proposed that as the existing gateways on these channels come up for renewal they will, wherever possible, be moved elsewhere. This will release channels in those areas where DV hotspots have been refused because of the lack of spectrum. This will also avoid DV/analogue co-channel clashes.

144.9625MHz has, in the interim at least, been left as 'Internet Gateway Analogue'. It could be used as an overspill for analogue internet gateways or for the reassignment of analogue gateways on 144.825 and 144.8375MHz.

If agreed, this new plan leaves a significant

number of channels readily available to packet radio. The actual number of mailboxes/nodes still active remains a somewhat unknown quantity.

It is hoped that these proposals will result in better spectrum utilisation and fulfil the current pressing need for additional Digital Voice Gateways.

The RSGB wishes to consult on these proposals through the use of its consensus process called the 'Litmus Test'. Details on how to access the 'Litmus Test', as well as additional information that relate to the proposals, will be available by following the link 'We need your Views' on the RSGB Home page (www.rsgb.org).

Steve Morton, F/G8SFR
ETCC Datacomms Manager

Olympic Updates

SPECTRUM USAGE & REGULATION.

The June edition of *RadCom* had extensive coverage on the main restrictions to support the Games in 70cm and 2.3/3.4GHz. At the time of writing Ofcom has approached the Society to discuss temporary usage of a few channels on 2m to support the Cycling Road Race. We will report on this and any further changes to VHF, UHF or microwave usage during the Games on our website and GB2RS, so please keep a watch for late changes or additions to Ofcom's spectrum planning.

RSGB ETCC has introduced its own webpage with maps for Olympic repeater changes and D-Star coverage enhancements at www.ukrepeater.net/london2012.htm.

Ofcom's consultation on enhancing its enforcement powers for the Games closed on

28 May. The Society made a significant input and is currently awaiting the final result.

Finally, the Ofcom Spectrum Licensing Centre has published a statement that as of 1 June applications will take longer than usual to process during the summer period due to the unprecedented demands on their operations – so plan ahead!

SPECIAL EVENTS. The Olympic Torch Relay is proving to be very popular with the public and operators of the 'Follow the Torch' award scheme. Around the UK, the Worked-all Britain WAB calls are based on G4WAB/G7WAB callsign with the appropriate club prefix.

Meanwhile preparations for the 2012L and 2012W flagship stations continue. The London station, 2012L, located at Avery Hill

Activity Centre, New Eltham, South London, has an ambitious plan for at least 60,000 QSOs and will begin operation on 25 July for seven weeks. The station will open to the public daily from 10am-4pm. The Welsh station will be easily accessible and located on the seafront esplanade at Whitmore Bay, Barry Island, just south west of Cardiff and the Millennium Stadium, which is hosting Olympic football.

WEBSEARCH

RSGB: www.rsgb.org/Olympics
Follow the Torch: www.worked-all-britain.co.uk/
Flagship Stations: www.2o12l.com/, www.2o12w.com/
Ofcom: <http://stakeholders.ofcom.org.uk/spectrum/olympics/>
Ofcom Enforcement: <http://stakeholders.ofcom.org.uk/consultations/undueinterference-olympics-2012/>

D-Star for London 2012 Olympics

GB70K, the London D-Star repeater, has had the server updated with Jonathan, G4KLB's IrcDDB software. Users can now access all D-Star reflectors as well as Dplus, XRF and DCS reflectors. All four new D-Star nodes in the London area, shown below, have come on air just in time for the London 2012 Olympics, giving extensive options for D-Star users.

MB6IHF: Harefield, West London
 MB6INL: Wood Green, North London
 MB6IOK: South East London
 MB6SS: Sutton, South West London

Don't forget that if you are attending the games, you mustn't take transmitting equipment in with you – see your ticket for rules and regulations.

P3EU in Cyprus

Cyprus is going to hold the EU presidency – for the first time – for six months from 1 July. To commemorate the occasion, a number of Cyprus Amateur Radio Society members have been granted the use of P3EU, which will only be valid for the six months until 31 December. There will be a 24 hour special event on 1 July. A special QSL card will be available. Operators will be active on the HF bands using SSB and CW for the 24 hour event and using all modes on the HF and VHF bands during the six months of P3EU.

Any visitors to the island during this time are more than welcome to join in with the CARS club members. They meet at DTs bar on the Tomb of the Kings Road in Paphos on the 3rd Thursday of the month at 7pm. There is also a local 2m net each Wednesday evening on 145.750MHz, CTCSS 88.5.

Yaesu FTDX3000

The new FTDX3000 HF plus 50MHz 100 watt transceiver uses the newest down conversion and crystal roofing filter technology. The down conversion 9MHz first IF can realise 300Hz, 600Hz and 3kHz bandwidth roofing filters. Yaesu claims that the 32 bit high speed floating decimal DSP provides effective cancellation/reduction of the frustrating random noise on the HF bands. Although the radio only has one receiver, a high speed spectrum scope is built in. When operated in the auto mode, the spectrum scope display is updated in real time. The maximum bandwidth of the scope is 1MHz and the minimum span width setting is 20kHz. There is no date set for a UK launch.

Railways on the Air

Lynton & Barnstaple Railway in Exmoor National Park in North Devon have a site available for a group wanting to take part in Railways on the Air in September. The railway station is at Woody Bay (51.20167N 3.88718W). For more details e-mail M3MDY@deyoung.org.uk.

Honeymoon Adventure

Helen Woolnough and Neil Melville, PA9N are setting off on a honeymoon with a difference, aiming to make a difference by raising money for charity. They are taking part in the Mongol Rally where participants drive, in no more than six weeks, from the UK to Ulaanbaatar in Mongolia, using a thoroughly unsuitable car of 1.2 litres or less.

Helen and Neil's entry is called The Uncertainty Principle. They will be driving a 9 year old 1.1 litre Fiat Panda on their epic journey, which starts on 14 July. They'll be raising money for the Lotus Children's Centre Charitable Trust and UNICEF.

Over the years Neil, PA9N has given many presentations to the AMSAT-UK International Space Colloquium in Guildford and his first spacecraft project was XO-53. One AMSAT-UK member who sponsored Neil, asked for the AMSAT-UK Logo, together with the caption that reads "You can have even more FUN in space", to be displayed on the underside of the bonnet for maximum exposure! See <http://theuncertaintyprinciple.co.uk>



Queensland Centenary

2012 is the Centenary of the Wireless Institute of Australia being established in the State of Queensland, Australia. A special Centenary callsign, VK100WIQ, will be activated until to 31 July by way of the WIA affiliated radio clubs in Queensland. There is also a Centenary QSL card and a Centenary award available. Details of the QSL card and award can be found at www.wia.org.au.

Kinetic SBS-3 – ACARS

Kinetic Avionic Products, makers of the SBS range of receivers and ADS-B/Mode-S decoders, have announced the inclusion of NMEA formatted AIS decoding in their latest Basestation software and SBS-3 firmware releases. The new firmware provides internal AIS decoding on any of the four SDR channels whilst the updated Basestation software provides a display of AIS data along with a socket stream interface for remote access to the data. The firmware upgrade is free of charge for SBS-3 users and is available from Kinetic's website.

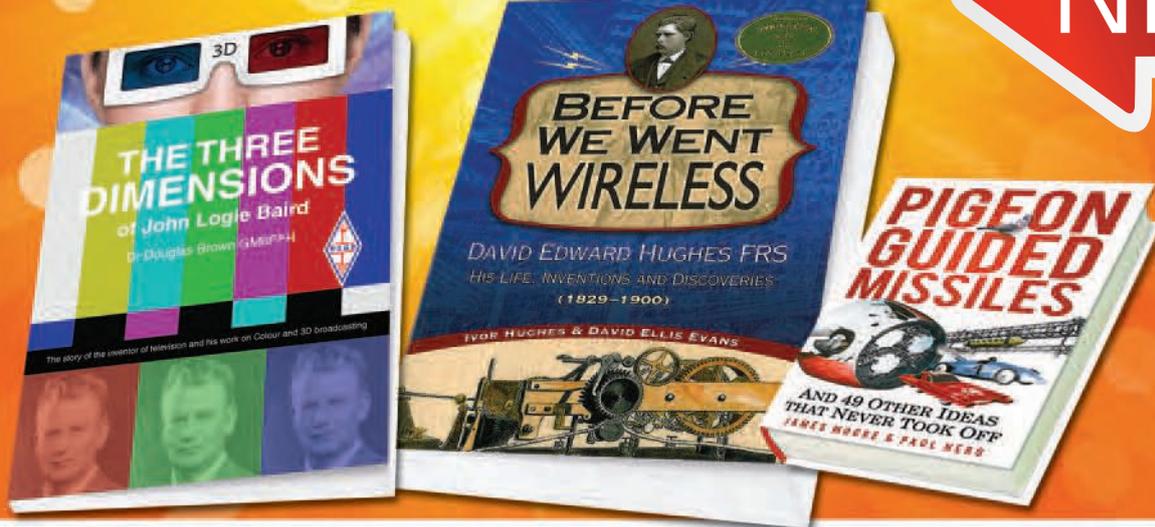


FLEX-6000 Signature Series

FlexRadio Systems have just announced the launch of their new FLEX-6000 Signature Series of receivers and transceivers with SmartSDR. The FLEX-6000 series is a completely new design that brings a wealth of new capabilities to amateur radio, including direct digital reception, transmission and networking. At the heart of the system is the use of a reusable framework that can be reconfigured to take account of future operating requirements. Direct Digital Conversion (DDC) is used for the Signal Capture Units and these feed the Field Programmable Gate Array (FPGA) where the signals are split into individual panadapters and slice receivers. This provides multichannel coverage from 0.3-77MHz and 135-165MHz. The transceiver variant has its output adjustable from 1 to 100 watts and all modulation modes are generated digitally. Networking is also included and the Flex-6000 enables full control from a remote location. Details at www.wsplc.com.

NEWS IN BRIEF

- PA3CNI and PA3AAF will participate in the International Lighthouse & Lightship Weekend from the former lighthouse Old Kraggenburg (NL0010) in the Netherlands. This lighthouse was in use until 1942. Activity will be on HF using CW and SSB. QSL via the bureau.



E&OE All prices shown plus p&p

The Three Dimensions of John Logie Baird

By Dr Douglas Brown, GM8FFH

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

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

The Three Dimensions of John Logie Baird is a fascinating read providing excellent reference work on his inventions, and an insight into the world of television.

Size 174x240mm, 208 pages
(mono & colour): ISBN: 9781-9050-8679-5
Non Members' Price £16.99
RSGB Members' Price £14.99

Before We Went Wireless

By Ivor Hughes & David Ellis Hughes

David Edward Hughes - His Life, Inventions, and Discoveries

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

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

Size: 180x261mm, 400 pages
ISBN: 9781-8845-9253-9
Non Members' Price £19.95
RSGB Members' Price £16.96

Pigeon Guided Missiles

By James Moore and Paul Nero

And 49 Other Ideas That Never Took Off

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

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

Pigeon-Guided Missiles is full of fascinating stories from history that could have radically changed the world – yet somehow failed to take off. Full of humour and detail this book is a delight.

Size: 124x200mm 256 page Hardback
ISBN: 9780-7524-5990-5
Non Members Price: £12.99
RSGB Members Price: £9.74 (25% off)



Yaesu FT-1D Digital Handheld

Launched at the Dayton Hamvention, the Yaesu FT-1D is a 2m/70cm device that provides both analogue and digital communications on both bands with up to 5 watts and wideband receiver coverage from 500kHz to 999MHz reception including the AM and FM broadcast band. The FT-1D uses C4FM FDMA (C4FM - 4-level FSK Modulation, FDMA - Frequency Division Multiple Access), which was developed for the professional LMR communications. It uses this enhanced technology for a lower bit error rate, resulting in stable communications without interruptions during mobile operations, even in a rapidly moving vehicle. Other features include GPS with logging and exchange function, image transmit (QVGA 320 × 240), optional camera microphone, mini-USB port and a Micro-SD card port. What's not clear yet is compatibility with any other digital system – or price.

Elecraft KAT500

The KAT500 is a new high power auto tuner that can be used with both the K3/KPA500 and all other HF amplifiers and transceivers. It uses the same topology and nce tuning algorithms as the 100W auto tuner in the K3 and the typical matching range at 500-600W is up to 10:1 on most bands (slightly less on 160m and 6m). It also works to a range of 3:1 for higher power levels, up to 1200-1500W. The KAT500 has a front panel SWR display and three switchable antenna outputs. It is the same width and depth as the K3 and the KPA500, and it is just 1.5" high. The first units were on show at Dayton.

Bluetooth headset

The new Midland Sportek headset lets you enjoy music, answer calls from your mobile or works with such radios as the Midland G8E-BT transceiver. The wireless behind-the-neck Bluetooth headset has a built-in microphone and weighs just over 100g. Costing £49.99, it is available from www.nevadaradio.co.uk.



I0JXX Antennas in the UK

Aerial-Parts of Colchester is now importing a range of VHF antennas from I0JXX. Antennas are available for 6m, 2m and 70cm, with 4m coming soon. The antennas feature anodised aluminium and stainless fittings for long life and round tapered booms for low wind resistance. Prices start at less than £100 for an 8-element 2m beam. www.aerial-parts.co.uk.



Mountain Goat

A Lake District summit Tarn Crag, G/LD-026, was the scene for Gordon, G0EWN to gain his SOTA Mountain Goat status. Gordon's campaign had started in February 2008 on Carnedd Llewelyn, GW/NW-002, and has been conducted exclusively on the 2m band, almost all on FM. The photograph shows Gordon on the summit of Mynydd Llangorse, GW/SW-015. www.sota.org.uk.



Kenwood TS-990S

The Kenwood TS-990S was launched at this year's Dayton Hamvention, although the radio at the show was prototype. Little is known yet about this new HF plus 50MHz transceiver with dual receivers. It is expected to have a maximum of 200 watts with a colour TFT display with spectrum scope, a built in keyer and auto ATU. European amateurs will get a chance to see the prototype at the amateur radio show in Friedrichshafen and stocks are expected in the UK around the autumn.

Prize Draw

LAM Communications has an unusual special offer running this month. There is a prize draw for a half hour introductory flying lesson or trip in an Robinson R22 helicopter from Elstree Aerodrome for customers who buy one of a range of Icom radios before 31 August. See the advert on page 79 for more details.



American Mountains

In December 2011, Helen, M0YHB went on a work trip to Albuquerque and Carolyn, G6WRW tagged along for a short holiday. Knowing that there were plenty of mountains nearby, they took along some radio equipment for a few potential SOTA activations in the W5N (New Mexico) and W7 (Nevada) associations. Arriving in Albuquerque, the first plan was to meet up with Fred, KT5X in Santa Fe for an activation of a nearby hill that has no name, only designated by its height, 9420 feet, and SOTA reference W5N/PW-020. A few days later Sandia Crest, W5N/SI-001, altitude 3255m was activated, with the summit temperature down to -10°C. Four summits were activated in total and these were the very first SOTA activations by amateurs from the UK in the W5N and W7 SOTA regions. The SOTA programme is currently expanding rapidly in call areas 4, 5, 6 and 7 in the USA. www.sota.org.uk.



Carolyn, W7/G6WRW/P activating Frenchman Mountain Northwest W7/CK-182, 3942 feet, enjoying superb views over the city of Las Vegas. She has recently achieved Mountain Goat status for reaching 1000 points.

DXpedition to Isle of Man

Dundee ARC are planning a small DXpedition to the Isle of Man (EU-116, WAB SC48, Loc IO74SF) between 18 and 25 August. The team will use the club call GT4AAF/P and will be active on all HF bands using SSB, CW and datamodes as well as 6, 4 and 2m. Paul, GMOBKC, Pete, GM1CMF, Colin, GM4JPZ, Scott, MMOSVK, Mark, 2MOLEW, Ally, MMODRA and Malcom, MM6PAU are planning on meeting up with the Isle of Man club who have been very helpful.

Olympic Torch Relay



On 27 May, William Williams, GW8TGS was an Olympic Torchbearer as part of the team carrying

the Flame through Aberystwyth. William, GW8TGS was nominated by the Rotary Club of Aberystwyth for his fund raising and his other voluntary work. William says he felt honoured to be taking part in this once-in-a-lifetime event.

IARU News

The Direction des Communications Electroniques of the Principality of Monaco has allocated the segment 472 - 479kHz to the amateur service with secondary status, with a maximum power of 1 watt EIRP.

The Regulation of the Council of Ministers has made changes to the amateur service in Poland. 70.1 - 70.3MHz is now available on a secondary basis with no more than 20W EIRP. 2.400 - 2.450GHz is available on the basis of non-interference to the other services, as is 3.400 - 3.410GHz, on a secondary basis with no more than 20W EIRP.

Now that terrestrial TV has been switched off, the National Communications Authority of Portugal has agreed to extend the 6m band. Category 1, A and B amateurs can use 50-52MHz on a secondary basis with a maximum power of 25 watts.

LUSO Tower

Are you considering purchasing a Luso tower? Well, Luso would like to hear from you. They are considering exhibiting at the National Hamfest in September and there is the possibility of a discount if your tower is the one they display. Contact Luso for more details by email to crank@lusotower.eu.

2012 National Hamfest

Dates for your diary: 28 and 29 September 2012. The organisers of the National Hamfest, Lincoln Short Wave Club, in conjunction with the RSGB, think that the vast majority of visitors to the show have an enjoyable time at Newark. Many have been every year and get the chance to meet old friends and new who have been met on the air.

This year they don't plan to make too many changes to the event but they will be making some improvements that they hope you will appreciate. Several times they have been asked about a licensed bar. This year they will be able to provide this, with lots of tables and chairs so you can sit and enjoy a drink with friends.

Another thing you have been asking for is hot food. The outside food vendors will be retained but there will also be something hot available in the bar area, along with filled rolls. Hopefully, this will please just about everyone.

Prices have been frozen this year and discounted tickets are also available.

Details and a ticket shop will be on the www.nationalhamfest.org.uk website soon.

Some people travel long distances to visit the show and the organisers are grateful that visitors take the time and trouble to join them at the show. They would urge that you consider car sharing to the event. It's not only cheaper but it is helpful to the planet! Last year, some people had travelled from the same area by different means, not knowing that the other was attending. Perhaps local clubs could let everyone in their area know who is going? The organisers will also offer you the chance to ask for lifts or car shares on their Facebook page, www.facebook.com/nationalhamfest, or you can tweet on twitter @nationalhamfest.

There's good news for those travelling from the West Midlands and South West. A new multi million pound road improvement to the A46 is close to completion. This will cut down the time taken by car from Leicester to Newark by at least 20 minutes. The new road is roundabout free and allows quick and free movement of traffic. We will also try to keep you in touch with any traffic problems via the 2m talk-in station, which will be on the air each day of the show from 8am.

The Newark and Nottinghamshire Show Ground venue is just couple of miles from Newark Northgate station, which has fast links from both the north and south. Typically it's just an hour and 20 minutes from London Kings Cross. Advance tickets are always a good idea and you may be surprised how cheap they are – from London it can be just over £10 single. Leeds to Newark tickets are priced at approximately £16 and the journey takes an hour. Coming from the West Midlands and beyond you will need to book to Newark Castle station.

There will be a special Blue Badge car park with an even surface and in close proximity to the main exhibition hall. In past years many visitors have struggled to the car park with big boxes. If you buy a bulky item at the show, there will be a loading bay for you right next to the ticket office.

NEWS IN BRIEF

- The International Lighthouse & Lightship Weekend is due to take place on 18 and 19 August. Registrations are going well. So far Australia has 42 entries and Germany has 36 registrations. At present there are 215 entries from 30 countries. Among those activating ten lightships are Australia, Belgium, England, Finland, Germany, Netherlands and the USA. The basic objective of the event is to increase awareness of lighthouses and lightships and their need for preservation and restoration and, at the same time, to promote amateur radio and foster international goodwill. www.illw.net.

- On 18 May, Ofcom issued a NoV for another propagation beacon to test the possibility of a 144MHz transatlantic path from the UK. Located at Lough Navar Forest in Co Feramanagh, Northern Ireland, at 349m ASL it will have a clear takeoff over the sea. GB3WGI will radiate on 144.487MHz towards North America, initially with an ERP of 100 watts relative to a dipole, with plans to increase this if licensing allows.

This beacon was made possible due to the generous donation of a transmitter by Brian Justin, WA1ZMS, the man behind the US 70MHz beacon, and NoV holder, Gordon Curry, G16ATZ who is providing the site and site services. This NoV is particularly welcome from Ofcom in what is clearly a busy Olympic year and the VHF weak signal community in the US and the UK thank them for their efforts. No date is yet fixed for the installation of the beacon, but plans are well under way and an announcement will be made in due course.

- The Polish Amateur Radio Union has reminded amateurs that the correct address for the QSL Bureau in Poland is PZK QSL Bureau, Box 54, 85-613 Bydgoszcz 13, Poland.

- Heil Sound has announced an upgrade to their PR 35 handheld dynamic microphone. While at first glance the changes are cosmetic in the form of a new chassis, several significant internal improvements have also been made. Rear rejection is -42dB with the upgrade. A concealed two-position roll off switch replaces the former thumb switch. The new PR 35 will be priced the same as the current model and is available to Heil Sound dealers now.

- This year marks the start of the Bi-Centennial celebrations in Ontario. The Niagara Peninsular ARC Inc will have a special event station, CG3B, on the air from 1 to 31 July in honour of General Brock, the leader of the British Forces. The station will be using all modes and bands as propagation permits. A special QSL card is available via VE3FOI.

- Icom UK has appointed two new company directors. Joining Icom UK's current board of Bob, Dave and Andy Stockley are Sam Taylor-Nobbs as Sales Director and Richard Owen as Financial Director. Both Sam and Richard have worked for Icom UK for over a decade. The appointment of the two new board members will help develop the business and add extra expertise in the areas of sales and finance.

- Dr Lucy Rogers, a freelance writer and journalist specialising in astronomy, spaceflight and engineering has recently achieved a Foundation licence, M6CME. www.lucyrogers.com.

- Waters and Stanton plc have been appointed as official reseller of Elecraft products for the UK. The popular K3 transceiver (ready-built) will be available from them by mid-summer. All products are now CE marked.

- Tynemouth Amateur Radio Club are holding their first ever mini DXpedition to the west coast of Scotland, based in the Lochgilphead area from 30 June and 7 July. It is intended to operate on all HF bands in a variety of modes & VHF (including satellite). They plan to activate Jura (EU-008) and some nearby SOTA summits. Equipment will be Kenwood transceivers, Hexbeam antennas and Acom Amplifiers. All details, including the callsign, will be available on the club website, www.g0nwm.com.

Start Here

A short history of radio (part 1)

INTRODUCTION. We welcome John Welsh, GONVZ, who is contributing a series of articles originally published in the Verulam Amateur Radio Club magazine, *Verulam News*. We thank them for permission to reproduce these articles, which are an eclectic mix of observations, theory and practical experiments.

EARLIEST TIMES. It all started about ten thousand years ago. As tribes evolved into city states and tribal skirmishes into organised battles, the shouts of a tribal chief were no longer sufficient to direct his warriors. Writing eventually evolved and, although less prone to error than the spoken word and could be taken over much greater distances, it could still only be conveyed by runner or horseback.

One of the earliest recorded events of this sort was in 490BC when Philippides ran 25 miles from Marathon to Athens with news of the Greek victory over the Persians. That's where the modern race gets its name. We owe a couple more things to the ancient Greeks: the idea that all matter was composed of simpler substances that they called 'elements'; and that there must be a tiniest amount of each element that cannot be divided into even tinier particles. These, they called atoms. They had no real evidence for either of these. They just thought it must be so. They only imagined four elements: Air, Earth, Fire and Water. In this they were wrong. We now know that there are 92 naturally occurring elements (and a few synthetic ones), but they were right about atoms – although they had no conception of how small they would turn out to be.

2000 years ago the Romans used a combination of horsemen and bonfire beacons to send messages. The beacon is really only good for saying "the thing we said might happen, has happened", but it can convey that information fast. These methods persisted until the coming of the railways at the beginning of the nineteenth century.

EVOLVING REQUIREMENTS. Meanwhile, on land and at sea, various flag and semaphore systems were developed. In 1857 the British Board of Trade published a list of 70,000 signals that could be sent using only 18 different flags. It became known as the International Code of Signals. With the increasing understanding of science during the nineteenth century, it was realised that electricity probably held the secret of fast and accurate communication, at least on land. Communication between ships was a different matter and aeroplanes hadn't yet been invented. Various analogue electrical systems were tried in which currents of

various strengths were sent along wires to a galvanometer, making its needle point to various different letters in turn. The best known of these was the Cooke & Wheatstone Telegraph, used extensively by the early railways. The technical problem (apart from it being slow) was that, due to leakage, the current received was sometimes less than the current sent, which led to errors.

A better system, where the current only had to be on or off, was invented by Samuel Morse in the USA in 1837. Within a few years Britain, the USA and much of western Europe were criss-crossed with telegraph systems using copper wires supported on poles. There were even submarine cables from Britain across the Atlantic, although the earliest were not very long lived or successful due to their designers not understanding transmission line theory. The original London to Edinburgh wires were about a quarter of an inch thick, for there were no amplifiers. Later, relay based amplifiers were used, but reliability was always a problem. The telegraph was used extensively in the American Civil War between 1861 and 1865 and by the British during their colonisation of South Africa and India.

ALL EARS. Morse never actually envisaged his code being heard: the current was intended to operate an 'inker' at the far end for reading later. In fact, when the telephone was invented by Alexander Graham Bell in 1876 and demonstrated to the chairman of the Western Union Telegraph Company, he said, "This telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us". In 1897, the English physicist Professor J J Thomson discovered the electron, invented the cathode ray tube and got the Nobel Prize for it, although it didn't have a great impact on communication for another decade. People were quite happy to use electricity without quite knowing what it was, but Thomson did destroy the notion that the atom was the smallest possible particle. The electron was 2000 times smaller and, in a conductor, could easily move between atoms. (His son, Professor G P Thomson also got the Nobel Prize for physics in the 1920s for proving that, under some circumstances, the electron behaves like a wave and not a particle. This 'duality' is still a hot subject today. I was privileged to study atomic physics under G P when he was head of the physics department at Imperial College).

THE FOUNDATIONS OF RADIO. In 1873, mathematician James Clerk Maxwell wrote his *Treatise on Electricity and Magnetism*, showing that a current produced a magnetic field, a changing magnetic field produced an electric field in space or a voltage in a wire – and this in turn could produce a current. Induction, dynamos and transformers quickly followed. In 1883 Edison observed a tiny flow of current in a modified lamp bulb and the thermionic diode was born, although no one had a use for it at that time. In 1888 Heinrich Hertz's experiments with spark gaps showed that electromagnetic waves could be transmitted across his laboratory, although his detector was incredibly insensitive by modern standards. It consisted of a tiny spark gap, observed with the aid of a microscope.

With this, he established that these waves moved with the velocity of light, measured their wavelength, proved that they were reflected by metal plates and refracted by paraffin wax prisms; thus, he verified Maxwell's theory experimentally. The possibility of communication over a distance without wires was predicted – the search was on for more sensitive detectors and more efficient transmitters of these new waves.

THE CAT'S WHISKER. At about the same time as Hertz was conducting his rather academic experiments, Anglo-American inventor David Edward Hughes discovered that a loose contact between a steel point and a carbon block would not conduct current but, if electromagnetic waves were passed through the junction point, it conducted well [1]. In 1879 Hughes demonstrated the reception of radio signals from a spark transmitter some hundreds of meters away, but although this formed the basis of the 'crystal and cat's whisker' detector that came into fashion some 30 years later it was not pursued at that time because an even more sensitive detector was making its appearance: the 'coherer'.

The coherer was really the result of the work of many men, including Hughes, Lodge, Branley and Popoff among others. It consisted essentially of a small quantity of metal filings lying loosely between metallic electrodes. The first practical form of the device for telegraphic purposes was demonstrated by Marconi, although he didn't invent it. In fact Marconi didn't actually invent very much. His talent was recognising a good idea when he saw it, improving it, then putting it to use. There were several forms of the device, all known as coherers, but all distinctly different and with different sensitivities. I shall say more about these in September, meanwhile next month I will visit a different subject altogether.

REFERENCES

- [1] *Before We Went Wireless*, Ivor Hughes and David Ellis Evans, available from the RSGB Bookshop - www.rsgbshop.org/



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Homebrew

Power, SWR, temperature and amplifier health monitoring with the Pinguino PIC board, plus a look at the 32 bit Olimex Pinguino MX220



PHOTO 1: My new homebrew Pinguino board driving a LCD display.

IS YOUR KIT OK? Many desktop computers have a 'health monitoring' feature as part of the BIOS setup utility software. These systems use a combination of software and hardware to monitor and control various operating parameters. The software may be part of the computer's built-in firmware or the operating system (Windows, Linux etc...). The hardware consists of multiple temperature sensors, voltage sensors, speed controlled fans etc. Modern computers have very sophisticated systems to manage power consumption and heat dissipation. Power hungry components like CPUs have built-in heat sensors and dynamically-variable clock speed and supply voltage. Some multi-core CPUs can temporarily shut down unused cores to conserve power when CPU load is light. These smart health and power management systems provide the inspiration for this month's construction project.

the MOSFET. So far, the FETs have survived this extreme test, but I'm sure my luck will run out eventually.

It would be very useful to have a generic health monitoring system that would monitor important parameters like power output, SWR and temperature. A simple system that would sound an alarm if certain parameters are exceeded would be quite useful. A more sophisticated system that could take corrective action when problems arise would be even better. Such a system could be used to activate cooling fans when the heatsink rises above a certain temperature or dynamically control fan speed to keep heatsink temperature within certain limits. In particularly dangerous situations like very high SWR or excessive drive, the amplifier may even be shut down completely until the problem is corrected.

The Pinguino PIC Board project [1] makes an ideal basis for a simple monitoring

and control system. Over the last few years, I have built no fewer than five MOSFET power amplifiers rated for more than 100W output. Two of these are rated for 400W output. They are all in good health at the moment, but there is always some risk of failure. The HF amplifiers are particularly vulnerable because I use a balanced doublet aerial with tuned open-wire line and a good old-fashioned manual ATU. On a few occasions, I have accidentally run the transmitter at full power while the aerial was tuned for another band. In this situation, it is quite likely that the SWR will exceed the maximum limits for

and control system. The PIC18F4550 and similar devices have numerous digital I/O pins for interfacing with devices like transistor buffers for relay control, LED indicators, LCD display modules, buttons, switches piezo buzzers etc. The PIC also has several channels of ADC (analogue-to-digital conversion) that can be used to read voltage from power and SWR measurement circuits. The ADC inputs can also be used to measure temperature using a simple thermistor circuit or a precision temperature sensor like the LM35 IC. The PIC pulse-width modulation (PWM) outputs can be used to control the speed of cooling fans.

My wish-list of features is:

- 1) Power measurement
- 2) SWR measurement, preferably with simultaneous display of forward and reflected power
- 3) Temperature measurement
- 4) Automatic fan control – and the fan(s) should be completely off when the heatsink is cool
- 5) Audible and visible warning for high SWR, overdrive or excessive temperature
- 6) Automatic shut-down in dangerous situations
- 7) Monitoring other parameters like supply voltage and bias voltage would also be useful
- 8) Monitoring the supply current.

The default configuration of Pinguino for the PIC18F4550 has 8 channels of ADC input and two channels of PWM output. This should be more than enough for our purposes. Even with all those pins configured for analogue I/O, there will still be 19 I/O pins remaining for digital I/O. The PIC also has a USB port that can be used for communicating with a PC.

THE PINGUINO BOARD. I have built several PIC boards based on the original 2009 design. These have served me very well and several are in daily use in the shack. I have found that it is very difficult to drill holes in the very small IC pads. The latest revision of this board has bigger pads and wider tracks than the original. I have also replaced the capacitors and resistors on the board with surface mount 0805 types.

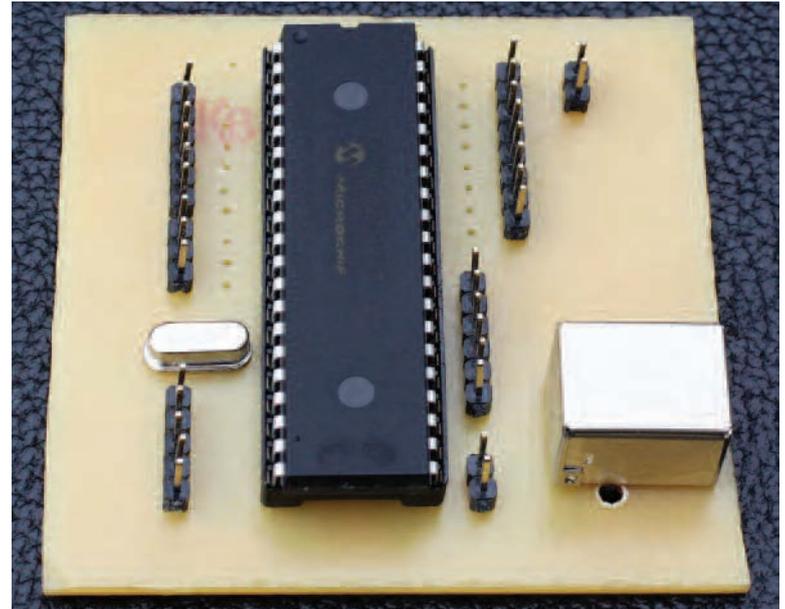
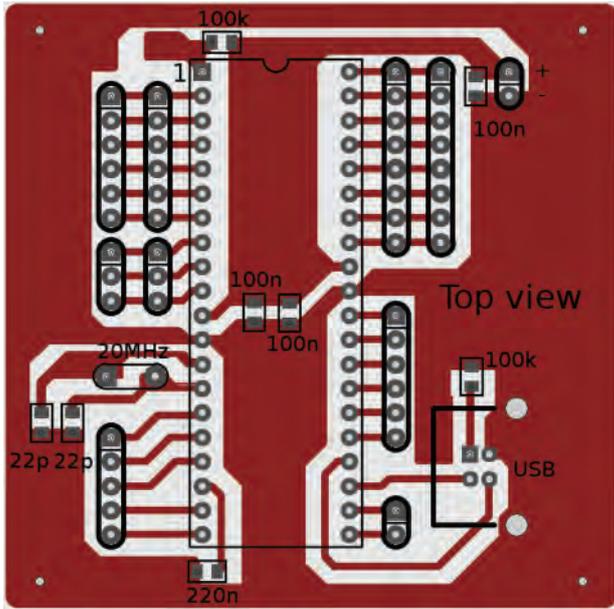


FIGURE 1: Overlay and tracks for the new Pinguino board. Full design info is at [1].

PHOTO 2: The new homebrew Pinguino board has much cleaner lines than earlier versions.

Photo 1 shows the Pinguino driving a 2x16 LCD module (Maplin N27AZ). Figure 1 shows the complete design and Photo 2 shows the completed board. Full details can be found at [1]. The circuit diagram, foil pattern, component overlay etc are available on the same web page.

READING THE PINGUINO ADC INPUTS.

The Pinguino board uses the `analogRead()` function to read the voltage on the ADC inputs (A0 to A7). By default, V_{ss} -to- V_{dd} (in this case 5V) is used as the ADC reference voltage. Reading the ADC produces a 10 bit value ranging from 0-1023. The pin voltage is $(x/1024)*V_{ref}$, where x is the sampled value.

Figure 2 shows a simplified ADC test circuit for the Pinguino board. A 10k pot is used to provide input voltage to A1 (pin 3). The 1k series resistor is included to protect the input from excessive current if I do something silly while testing the circuit. There are only two methods of displaying the result of the test. The first is to light the LED on I/O pin D7 (pin 40). The alternative method is to send the sampled value to a PC via the USB port. Either method is very easily achieved using Pinguino.

First the LED pin is defined for future use:

```
#define LED 7
```

This pin is then configured as an output:

```
pinMode(LED, OUTPUT);
```

An integer variable "x"

is declared as a place to store the sampled value:

```
int x;
```

Reading the ADC input is as easy as:

```
x=analogRead(A1);
```

The sampled value is now stored in the variable x. As a simplest possible test, we can check if the pin voltage is greater or less than 2.5V with a simple if statement:

```
if (x>512) digitalWrite(LED, HIGH);
else digitalWrite(LED, LOW);
```

If the sample is greater than $(512/1024) \times 5V = 2.5V$, the LED is illuminated. The Pinguino source code for this simple example is shown in Figure 3. Source code for the other examples can be found on the web page. To send the sampled value to your PC as a USB CDC (communications

device class) device, you can use the Pinguino CDC. `printf` function. This is basically a USB version of the well known `printf` (print-formatted) function from the C programming language.

From my example code:

```
CDC.printf("Sampled value: %d\r\n", x);
```

This sends the ADC sample value as an ASCII string for each iteration of the Pinguino main loop in the following format: "Sampled value: 512" followed by carriage-return and line-feed control-characters. The CR=LF pair prevents subsequent samples running off the edge of your terminal screen. On Linux systems,

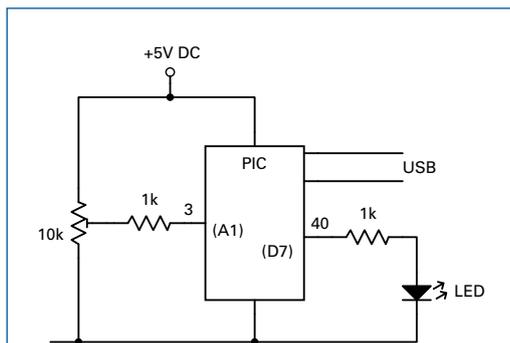


FIGURE 2: Simplified ADC test circuit for the Pinguino board.

```
1 /* Simple ADC test */
2
3 #define LED 7 // Use D7 as the LED pin
4
5 int x; // Sampled value
6
7 // Configure LED pin as an output
8 void setup()
9 {
10     pinMode(LED,OUTPUT);
11 }
12
13 void loop()
14 {
15     x=analogRead(A1); // Read ADC
16
17     // LED on if V-in above 2.5V
18     if(x>512) digitalWrite(LED,HIGH);
19     else digitalWrite(LED,LOW);
20
21     delay(1000); // 1000ms delay -
22                 // and repeat forever
23 }
```

FIGURE 3: Pinguino source code for the simple circuit of Figure 1.

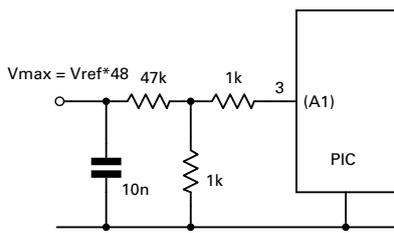


FIGURE 4: ADC input circuit suitable for 100W power levels.

the received data can be seen using the cat command:

```
cat /dev/ttyACM0
```

– assuming that the Pinguino is the only USB CDC device available.

MEASURING HIGHER VOLTAGES. We can use a simple resistive divider to sample voltages higher than 5V. The standard formula for a potential divider $R2/(R1 + R2)$ gives the voltage division ratio. The resistor on the high voltage side of the divider should have a value that is high enough to limit current through the PIC input protection diodes to safe levels, even if the 0-5V limits are exceeded. **Figure 4** shows the ADC input circuit I use with my 100W dummy load and RF voltmeter. This gives a theoretical maximum input voltage of 240V. In practice, the 0.25W rating of the 47k resistor limits maximum voltage to just over 108V. The dummy load and peak voltmeter schematic is shown in **Figure 5**. The resistor is a 50Ω 100W tubular carbon resistor. The RF rectifier is a string of four 1N4148 diodes. The capacitors are ceramic types with a voltage rating of several hundred volts. This load works well from DC to 70MHz.

I also had a similar load/voltmeter for VHF/UHF but, as regular readers will already know, that one suffered a violent death last month.

The voltage output from this circuit is the RF peak voltage minus the forward voltage drop of the diodes. This is nominally 0.6V per diode, but it does vary depending on diode current. RF peak power is $V^2/2R$ or in this case, $(V_{\text{measured}} + 2.4)^2/100$. Note that 2R is used because we are measuring the peak voltage and not the RMS voltage of the RF sine wave. This produces the same result as the standard V^2/R formula where V is $V_{\text{peak}}/\sqrt{2}$, ie $70.71^2/50 = 100W$. **Photo 3** shows how the Pinguino can be used to measure high power using the dummy load and 47k/1k voltage divider on the ADC input.

INTERFACING TO A STANDARD LCD MODULE. In March 2010 [2] we looked at methods of interfacing the PIC to a standard HD44780 compatible LCD display module. The functions used to drive the LCD will be

re-used for this project. Full details and sample code are on the web page. The “Hello World!” code example contains everything we will need.

As there are plenty of PIC I/O pins available, I have used the 8 bit transfer mode for sending data to the LCD module. DO to D7 of the LCD are wired directly to Pinguino pins D0 to D7 (PORTB 0-7) of the PIC18F4550. The R/W line of the display module is tied to ground because we won't need to read from the module. The RS (register-select) and ENA (enable) pins were initially wired as in the previous project. All of the functions from the previous project worked perfectly.

```
lcd_init(); display_string("Hello World!");
```

produced the expected result. The next test was to read one of the ADC inputs and display the sampled value on the LCD. This test was rather less successful. The LCD remained stubbornly blank regardless of how much data I sent to it. After much muttering and head scratching, I eventually realised the I/O pins used for the RS and ENA lines are also part of the PIC's ADC module. In the default configuration of Pinguino, if any of the ADC inputs are used for analogue voltages, none of the other inputs of the ADC module are available for digital I/O. Rather than messing about with the ADC module configuration, I just moved the RS and ENA wires to different I/O pins.

```
#define RS 27
#define ENA 28
```

These are physical pins 29 and 30 on the PIC18F4550. The LCD and ADC inputs are now working properly.

Before the sampled data is sent to the LCD module, the 10 bit binary value must be converted into a string of ASCII characters. For example: a sample of 123 (decimal) is



PHOTO 3: The Pinguino can be used to measure high voltages and power (see text).

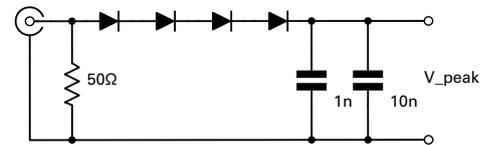


FIGURE 5: Dummy load and peak voltmeter circuit.

0001111011 in 10 bit binary. What the LCD needs is three separate characters '1', '2' and '3'. One of the libraries supplied with Pinguino <stdlib.h> has a function called `itoa()`; which converts a variable of type `int` (integer) to an ASCII string. This is called with the following parameters:

```
itoa(int data, char string, int radix);
```

so

```
itoa(sampled_value, display_str, 10);
```

would take an integer `sample_value` and write it to a `char` (character) `string display_str` using a `radix` of 10 (for decimal). This string is easily sent to the LCD. From my example code:

```
itoa(sampled_value, display_str, 10);
display_string(display_str);
```

TEMPERATURE. Our health monitoring system will need at least one temperature sensor and possible more. A simple resistive divider made from a thermistor and a resistor can be used to measure temperature. The temperature-resistance curve for a thermistor is not linear. This is not a problem if you just want to see if a temperature is above or below a certain threshold. Calibrating your system for the characteristics of an individual thermistor is not too difficult and you only need to do it once.

If you need a precise temperature value over a wide range of temperature, it is much

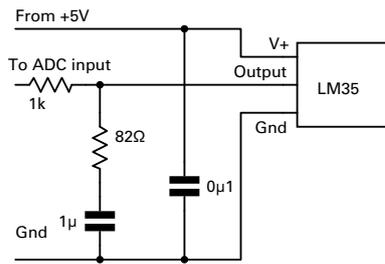


FIGURE 6: Using the LM35 temperature sensor IC.

easier to use a precision temperature sensor IC like the LM35. This three-pin, TO-92 transistor sized device is available in small quantities for around £1. A digital thermometer based on this device will be accurate to a fraction of 1°C over the temperature range 2-150°C. **Figure 6** shows the LM35 as used in my temperature measurement circuit. The chip produces an output voltage change of 10mV per 1°C of temperature change.

The series 82Ω, 1μF RC network across the output was absolutely necessary in my test circuit. Sampled measurements were inaccurate and unstable when this network was omitted. Reading the sensor with the Pinguino was trivially easy:

```
temp_sample=analogRead(LM35);
```

the constant LM35 had been previously defined as A0 because the sensor is connected to ADC input A0 (PIC pin 2). Once the value is sampled, it is easily manipulated to produce the required temperature value.

```
temperature=((temp_sample/1024.0)
*4950)/10)+1;
```

gives me consistently accurate results compared to a couple of digital thermometers. Note that "4950"mV is the voltage from my 7805 5V regulator IC. I find that these devices tend to err on the side of caution. Output voltage is usually just under 5V and rarely over 5V. If you have a very accurate digital voltmeter, you can adjust this value to match your hardware. Otherwise, you can leave it as it is or change it to exactly 5000.

SWR AND POWER. The Pinguino can be used to read the DC voltages from the Fwd and Ref outputs from an SWR bridge (see last month's VHF directional coupler) or a broadband directional coupler (October, November 2007). Or you could use the broadband coupler from the current *RadCom* article by Ken Ginn, G8NDL.

For accurate power measurement, we must know the coupling factor of the coupler. For some types of coupler, this is easily calculated, for others it is easier to measure it by terminating the coupler with

a 50Ω load and feeding the input with a known power level. This can be used to calculate the voltage ratio between through-line voltage and coupler output voltage. For example: a -20dB coupler will have a voltage ratio of $10^{(20 \div 20)} = 10$ or a power ratio of $10^{(20 \div 10)} = 100$. SWR and return loss (RL) can be calculated without any knowledge of the coupling factor. Once we know the voltage ratio, the SWR and RL is easily calculated. The basic formulae are shown in **Figure 7**.

At its current state of development, the health monitor is measuring power output, SWR and temperature of my 4m MOSFET amplifier. I have set warning thresholds for maximum output, maximum SWR and maximum heatsink temperature. The 12V cooling fan is driven by a transistor buffer that is switched by a PIC digital I/O pin. The fan is not activated unless the heatsink temperature is above 25°C. This means no fan noise while the amp is on standby. I am also experimenting with using one of the PWM outputs of the PIC to drive the fan buffer.

```
analogWrite(FAN, value);
```

a value of 512 gives reduced speed and reliable fan operation with a 13.8V supply and a cheap 12V computer fan. These fans are designed for PWM control.

THE OLIMEX PINGUINO MX220 PIC BOARD. Pinguino now supports the PIC32 processor. This brings 32 bit processing and the power of the Gnu gcc compilers [3] to the Pinguino platform. The PIC32 is based on the 32 bit MIPS CPU architecture. I have just received the new Pinguino MX220 board

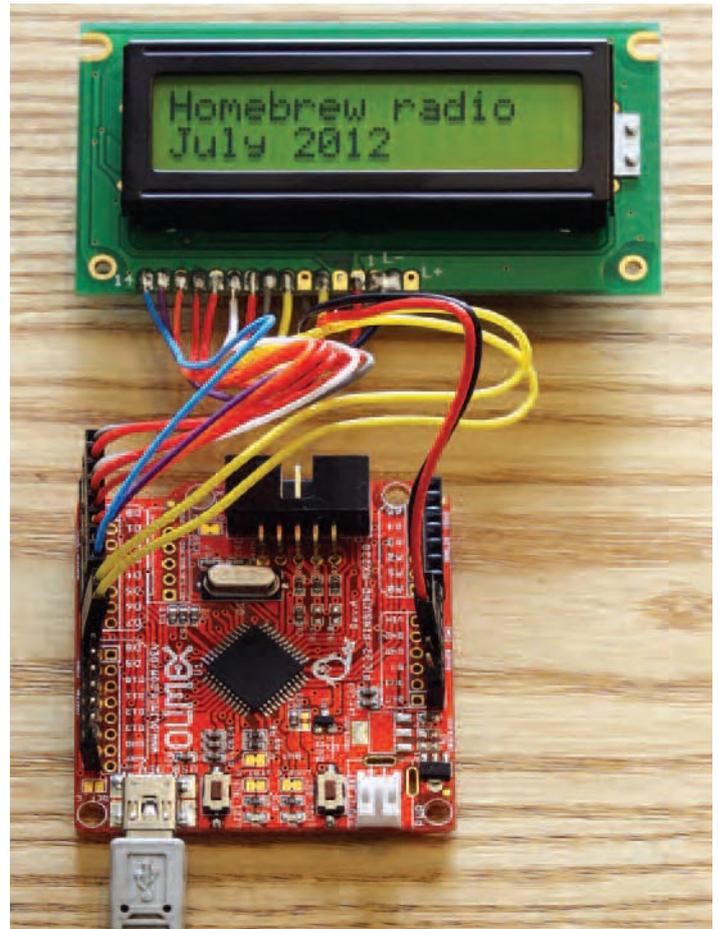


PHOTO 4: The Pinguino Olimex board driving an LCD module.

$$\Gamma = \frac{V_r}{V_f}$$

$$\rho = |\Gamma|$$

$$VSWR = \frac{1+\rho}{1-\rho}$$

$$RL = -20 \text{LOG}(\Gamma)$$

FIGURE 7: Basic formulae for VSWR and return loss (RL).

from Olimex. This is a small Arduino/Pinguino sized board with a good selection of analogue and digital I/O pins. So far, I have only had time to do a few experiments with an LCD module, ADC input and USB CDC input/output. **Photo 4** shows the Olimex board driving a Maplin N27AZ LCD module. The latest versions of the Pinguino IDE support both 8 bit and 32 bit PICs [4].

WEBSEARCH:

- [1] Homebrew, November 2009 and <http://homepage.eircom.net/~ei9gq/picboard.html>
- [2] Homebrew, March 1020 and <http://homepage.eircom.net/~ei9gq/dds.html>
- [3] <http://gcc.gnu.org>
- [4] <http://pinguino.cc>



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The 2011 and 2012 IOTA Contests



RV1AQ/P on Peredovik Island (EU-133).

RESULTS & RULE CHANGES. Unfortunately, the 2011 IOTA Contest results appeared somewhat later than normal this time round, mainly due to my participation late last year in the T32C expedition (this year, all being well, normal service will be resumed, with provisional results available in time for the RSGB Convention). As a result this write-up is also on the late side, but does present a great opportunity to introduce the 2012 contest, too. This is of particular relevance as we are introducing some important rule changes of which intending participants need to be aware.

IOTA CONTEST 2011. Participation in the 2011 IOTA contest yet again set new records and we received 2324 entries. It is a shame that some potentially high scoring stations don't send us their log, especially those on islands, as those QSOs would otherwise be available to island hunters wanting to claim them for awards credit.

But, generally, it can be said that the 2011 contest was a great success. Propagation was pretty good, at least on the Saturday, resulting in some very high scores. And, as can be seen from the small selection of Soapbox comments, the event remains a fun holiday diversion for some and it's a great chance to pick up some needed island counters for those remaining at home. That will be especially relevant in this and next year's contests, offering an opportunity for those participating in the IOTA 50th Anniversary Marathon to pick up lots of counters.

RESULTS. The Brizzle Group (OK, the Bristol Contest Group) once again took top spot as

leading multi-operator team, though it was much closer than in 2010. The top four teams had QSO totals ranging from 3365 to 3660, with Bristol the lowest of the four, but made up for by a great multiplier total and a heavier bias towards other island stations in their logs (island stations counting for more points, for obvious reasons). The SY9M team on Crete, who came second in 2010, were edged into third place by IBOR, a primarily Slovak team, operating from Ventotene Island (EU-045). The leading Low Power team were CR6R from Pessegueiro (who had also won the previous year, as CS2K). Unfortunately, it remains tough to achieve a high score from outside Europe and Africa in this event, although with improving band conditions and an increasing awareness of the contest in Japan and North America this will hopefully start to change. But congratulations to the VC1D team, operating from Bon Portage (NA-126) who put in the highest North American score, albeit ending 22nd in the overall multi-op listings.

The leading single-op island station was Laci, HAONAR, operating as SX8R from Thasos (EU-174) in the Mixed Mode section, while CW honours went to SP8RX/1 on Wolin Island (EU-132) and SSB leader was 5B4AIF on Cyprus. LZ5R leads the Assisted entrants (ie those using the Cluster and RBN networks), closely followed by OG6N. The particular benefit of the Assisted category is that serious island chasers need not miss any of those rare ones that they might need for the various IOTA awards.

Most readers will be aware that we stopped printing full listings some years ago as they would run to too many pages,

but all the results are available on the web, with pull-down menus allowing you to compare your results in various combinations. On those pages you can also read the full Soapbox comments, see lots of photographs and find the listing of trophy winners.

Once again, the Mediterraneo DX Club of Italy ran an SWL competition in parallel with the IOTA contest and results appear on their website. As always, we thank them for taking on this activity.

2012. It is ten years since there were any significant changes to the IOTA contest rules, so the Contest Committee felt that a review was in order, mainly to put right some known issues and contradictions. All previous entrants have been e-mailed with an overview of these changes and they are highlighted in the 2012 rules on the RSGB Contest Committee website. But it is worth summarising them here. One of the major problems in recent years has been that the emphasis seems to have moved away from working islands *per se*, to working everyone and simply chasing islands as multipliers. In part this has been due to the relatively poor propagation, which has meant that only one or two bands are open at a time and these become crowded. So there has been a tendency, even for non-island stations, to find a run frequency and simply work all comers, whether island stations or not. To try and restore the balance, the relative points value of island and non-island stations has been adjusted. At the same time we have felt it necessary to discontinue the World multi-op category (which, in any case, was a relatively recent introduction). Another rule change, this time in response to a number of requests from would-be expeditioners, is to remove the antenna restrictions on low power expedition operations. They were introduced to 'level the playing field' as it can be tough to take anything other than a simple dipole or vertical on a small boat or aircraft, but the balance of opinion seems to be that is tough enough



SP5APW operated in the World 24hr SSB category.

SOAPBOX EXTRACTS

Had great fun with QRP in the IOTA contest during our holiday on the Azores. – CU/PA1B

It was nice time to go vacation with radio friends. Holiday style operation and had a lot of fun. See you next year from another Korean Island. – D93I

Had a great time working all those IOTA stations. Cannot wait until next year! – K5CVD

Overall claimed score is up on last year due to higher scores on the HF bands and higher pts per QSO from the runs to JA. – GJ6YB

running low power in such a busy contest, without being restricted antenna-wise as well. At the same time we have opened up the strict definition of a DXpedition so that, for example, it is now acceptable to have an element of local involvement in a DXpedition operation.

The final rule change has proved somewhat more controversial, but we believe it necessary. In brief, we have introduced a limit on the number of band changes per hour for both run and multiplier station for island multi-operator entrants. In doing so we are following a path that many other major contests have followed, and for the same reasons, which are that the existing rules are easily abused, with some entrants running something more akin to a multi-multi sort of set-up. There is no evidence that the winning entrants have been doing so, but there is certainly good anecdotal evidence that such practices are by no means unusual.

For most entrants, we believe these various rule changes will be welcome, refocusing the contest on making island QSOs and encouraging island expeditions which, after all, is what this unique operating event is about. We hope to see you active in IOTA 2012 (and, yes, you are very welcome to use that Olympic special event prefix!).

HOW TO TAKE PART. That's the heavy stuff out the way. How can you participate? The good news is that, by definition, every UK station is on an island (mainland UK is EU-005). But making an island expedition is relatively trivial if you head for a holiday island, whether something like the Isle of Wight here in the UK, or maybe one of the French coastal islands. Enter the Low Power category and a small 100 watt radio should be perfectly adequate, maybe even running off the car battery (though don't run it down completely or you may be in need of a push!).

There are no single-band categories, so you need to think about covering the five contest bands, 80 through 10, but there are a number of lightweight solutions to that, especially if you can get close to the sea, where verticals really come into their own. My personal preference is a 10m glass fibre fishing pole, with quarter-wave verticals pre-cut for 10 through 40, and simply taped



The multi-op winners – GJ6YB (Bristol Contest Group).



MOBGR/P on the Isle of Wight.



9A/OM8AA operating from EU-016.



9A/OM8AA operating from EU-016.

to the pole. Feed at the base against some radials thrown out around the feedpoint – I have never tried to make radials 'resonant' as this is a meaningless concept if they are on the ground. What you are trying to achieve is good capacitive coupling to the local ground, so plenty of random pieces of wire, or a few lengths of chicken wire should be perfectly adequate. 80m can be more of a challenge, but that same pole can probably be persuaded to support a simple inverted-L and, as the nights are short at the end of July, you only need to be on 80m for a few hours at most. And if the family can't spare you for the full 24 hours, there are 12 hour sections too – you can even break up the 12 hours provided each off period is at least 60 minutes.

As for logging, take an old laptop, running SD or one of the other popular contest logging programs. It will only take a matter of minutes to create the Cabrillo file and upload it once

the contest is over – and you have three weeks to do so, so it can wait until you are home again.

So, as a reminder, the 2012 contest takes place, as always, on the last full weekend of July, the 28th and 29th, from 1200UTC on the Saturday for 24 hours. Make a note in your diaries now.

THANKS. My thanks to all who helped make the 2011 IOTA contest a success, including MMOBQI, GOWWW/5B4WN, G3LZQ, MDXC, the RSGB Contest Committee and the various trophy sponsors.

WEBSEARCH

RSGB Contest Committee: www.rsgbcc.org
 IOTA Awards Programme: www.rsgbiota.org
 IOTA Anniversary Marathon: www.rsgbiota.org/marathon/marathon.pdf
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Design Notes

Avoidable disasters and active antennas



PHOTO 1: Montage of typical damage resulting from a sustained overvoltage on the input to regulator chips. These were all the result of a power supply fault triggered by a lightning-induced transient.

CARNAGE! Fred Zappa, 2E9ZAP [1] made a big mistake. For convenience, “because it was to hand”, he used an old 2A, 0 – 50V bench-type adjustable power supply set at 12V to power his masthead mounted 24GHz transverter. Everything worked well enough for a long time until a recent thunderstorm. He writes, “... [there was] a blinding big flash and a mighty bang and a crack /fizz which sounded like it came from my mains sockets, although that might have been the electric field collapsing after the strike. The neighbour had his cordless phone go down plus an external TV camera. I did first wonder if it had struck my mast and his ensuing damage was the strike dissipating through his ground. There was no evidence of any damage to the mast at all, so must have been a nearby ground strike...”

“I got the mast down and found the remains of my 24GHz system following the lightning (see **Photo 1**). It looks like all the three-terminal regulators have gone, leaving some rather messy remains to clear up. I just hope they blew to open circuit and saved what was downstream. Looks like the scenario has been that the shack 12V PSU serving the 24G may have been hit by either a mains spike or discharge down its mast lead on the LV side, leading its output to soar to 50V or more when regulation failed. This in turn took out the three-terminal regulators. Awful smell too!”

The PSU was an old design with several pass transistors in parallel. The induced transient caused one to fail short circuit and allowed the full rectified input at more than 50V to get to the load. It is not known whether the transient arrived on the mains input cable or on the DC lead going up the mast, or even as a kilovolt spike across both.

Whatever happened, it was enough to damage the PSU and cause one device to fail short circuit – with the knock-on consequences. Fred continues, “... the output fuse also blew but it seems to have perhaps taken some time. I did smell burning at the time but the PSU has no ON light so didn't realise it was off until some minutes later, by which time the damage had been done.”

LESSONS LEARNT. The lightning strike itself only appears to have caused minor damage to the PSU, causing a single pass transistor to go short circuit. But the ensuing overvoltage destroyed all the voltage regulators further down the chain. Both LM317 and 78xx types are rated for inputs up to about 30V, so the 50V killed them. It is fortunate that in some cases these must have then failed open circuit, protecting more delicate circuitry further down the chain. In other cases it appears that tantalum capacitors may have worked as voltage clamps, preventing voltage levels rising too high, although blowing themselves apart in the process. It does appear as if some of the more sensitive, expensive and exotic microwave semiconductors have survived, although several were damaged or degraded in performance. Most damage was to the power supply regulators and decoupling capacitors.

So what has been learnt? Firstly, for semi-permanent installations, never use an adjustable PSU that can ever deliver a voltage significantly above the maximum input allowed for any downstream equipment. This includes all equipment with its own power supply regulators. Even if it never gets damaged, there may come a point when the voltage setting control is tweaked accidentally. Provide an overvoltage clamp or trip on all PSUs and set this at a safe maximum, just above the working voltage. Do not rely on output fuses to protect downstream equipment; the PSU mentioned could easily supply 50V at 2A forever when fully working. If equipment is to be left on continuously, add extra circuitry to kill the mains input if the output goes under or over voltage – this is a commonsense safety precaution against any nasties and is best implemented with a latching relay system on the PSU mains input. And do include LEDs on the PSU to indicate input and output volts are present and correct!

When masthead equipment is in use, provide transient suppression components such as Transorbs and firmly bond all grounding cables and OV points together. That way, if transients do get induced, everything ‘jumps’ together. And finally, if you smell burning – switch off! [2].

ACTIVE ANTENNAS. An active antenna offers a convenient solution for a small sensitive receive-only system in the VLF to HF range, 0 – 30MHz. The principles behind active antennas (sometimes referred to as voltage probes) and their correct installation is not always fully appreciated. An arbitrarily short metal probe is placed at a certain height above ground where the electric, or E-field, component of any radio signal induces a voltage in the probe. The magnitude of the induced voltage is given by the field strength of the signal in volts per metre multiplied by the height of the bottom of the probe above ground. Note that the length or shape of the probe does not inherently affect the induced voltage, although it does affect efficiency, as we'll see shortly.

The probe is now connected to the input of an amplifier with a very high input impedance, a voltage gain of unity but with a high current gain – such as that shown by emitter or source follower circuits. The amplifier has to be installed at the base of the probe, with its reference connection going to ground vertically underneath. The induced voltage on the probe is then transferred to the output port, which can feed down coax or other suitable RF feeder to a receiver. In theory, the input to the receiver, in (micro)voltage is now pretty close to the field strength multiplied by height of the probe. But it's not quite that simple.

The impedance of the probe consists of a very high resistance in parallel with a few (tens of) picofarads of capacitance. To all intents and purposes for an electrically short probe the resistive part can be considered infinite so the impedance of the probe now appears as a small capacitor with respect to ground. We'll assume 10pF as a working value for now. Consider the 80m band.

TABLE 1: Mini-Whip antenna specifications.

Frequency range	10kHz – 30MHz
Power	12 – 15V at 50mA
2nd order output intercept point	> +70dBm
3rd order output intercept point	> +30dBm
Maximum output power	> -15dBm
Dimensions	100mm x 40mm diameter

At 3.7MHz, 10pF has a reactance of 4.3kΩ. At 137kHz this rises to 116kΩ. To avoid undue losses, the amplifier input impedance must be appreciably greater than this to avoid the voltage being divided down. FET source followers are nearly always used, followed by at least one, and sometimes two more stages of current gain. Making the probe capacitance as high as possible with a large area also helps, as the resulting source impedance is lower. Making the probe longer is not always a good idea. At the upper frequency end, where a long probe no longer appears electrically short, large signals could appear that cause overloading. In practice, short and fat is the rule. Or at least moderately short.

The circuit of **Figure 1** shows the circuit diagram of the Mini-Whip antenna [3] designed by Roelof Bakker, PAORDT. This is typical of such designs; this particular one is simple to build and has proved itself time and time again amongst operators on the 137 and 500kHz bands. It is used extensively by the receive only 'grabber' stations monitoring those frequencies. The probe itself consists only of a piece of copper, half the PCB, just 30 x 45mm in size. A J-FET source follower presents very high input impedance with only a few pF in parallel, and 1MΩ input bias resistors ensure the input impedance is of this order. A medium power RF transistor run at several tens of mA serves as output buffer driving the 50Ω line. DC power is supplied up the coax from a bias tee situated at the far end. The performance achieved, shown in **Table 1**, is impressive.

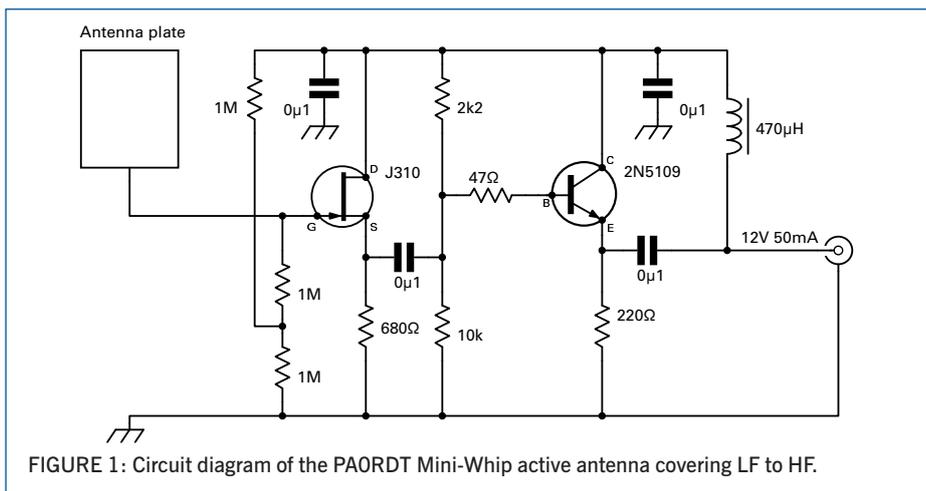


FIGURE 1: Circuit diagram of the PAORDT Mini-Whip active antenna covering LF to HF.

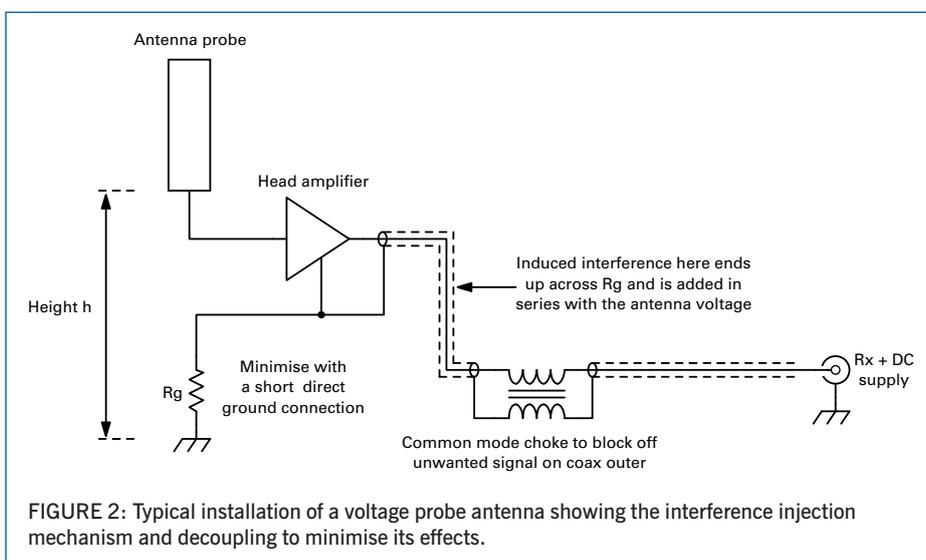


FIGURE 2: Typical installation of a voltage probe antenna showing the interference injection mechanism and decoupling to minimise its effects.

INSTALLATION GUIDELINES. Active

antennas respond to electric fields and this means they are particularly susceptible to locally generated E-field interference, which is generally a short range phenomena. There are two important criteria that must be met when installing such an antenna to minimise unwanted pickup. First, mount it away from electrical wiring and any locally generated interference sources. In practice, this means at the end of the garden, away from the property. Indoor or loft mounted versions are certainly not advisable. A long run of coax is quite acceptable, as the power gain provided by the head amplifier is more than adequate. Secondly, the common, or ground connection of the amplifier must be firmly connected to ground directly underneath the probe.

Consider what happens if local interference is imposed on the outside of the coax – exactly the situation that will happen as it passes indoors next to interference generating equipment. Refer to **Figure 2**, which shows a typical installation. Unwanted signals will travel along the outside of the coax until they reach the head amplifier. If the far end is not perfectly grounded, as shown by the resistance Rg, the unwanted signal voltage will be imposed across Rg, which is effectively in series with the probe,

so the unwanted signals will enter the receive chain. As perfect grounding is almost impossible to achieve in practice, extra isolation against common mode local interference can be added by a common mode choke in the feeder. One way is by winding many turns around a ferrite core. Burying the cable to give additional decoupling will also help. Several users have resorted to transformers for common mode isolation, with a battery for remote power isolated from the mains supply. One user resorted to optical coupling, although I suspect the linearity of the analogue voltage / optical conversion process was not too good.

In any practical design, measures ought to be taken to provide protection against static and high voltages on the probe with its high input resistance. A direct connection to the J-FET is not always a good idea; an input capacitor for DC blocking is often included, along with a spark gap or neon tube to discharge high voltages, as well as a bleed resistor. Depending on how low a frequency response is desired, a high pass filter is often included somewhere in the circuit to reduce any 50Hz hum levels to below those that could cause any non-linearity. Having said all that, the PAORDT whip is being used

successfully by several of the group of amateurs experimenting at 9kHz.

INDEX PROJECT. See [4] for an index of subjects covered in past Short Circuits and Design Notes. An index for past Data columns is also available.

INPUT WANTED. Can I have your ideas please? For too long this column has been written around designs and experiences either by myself, gleaned from published works or colleagues' experiences. I would like to receive some of YOUR ideas and experiments, your projects and experimental work, your experiences, catastrophes and successes (and failures). All contributions to the address at the top please.

WEBSEARCH

- [1] Name and callsign have been changed to protect the innocent and avoid embarrassment.
- [2] If you smell burning switch off, but do try not to black out half a city! See www.g4jnt.com/Hams_Hall_Investigation_Report.pdf
- [3] PAORDT Mini-Whip antenna
– www.radiopassioni.it/pdf/paOrdt-Mini-Whip.PDF
- [4] Index for Design notes
– www.g4jnt.com/DesignNotesIndex.pdf
and for Data
– www.g4jnt.com/DataCollIndex.pdf

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A square short loop antenna for 160-40m

Building on his successful design from the early 1990s, the author gives his loop antenna a new lease of life



PHOTO 1: The refurbished loop for 160, 80 and 40m. The tuning unit is in the box at the top.

INTRODUCTION. After over twenty years of excellent activity, my square short loop antenna for the low bands (originally described in the February 1991 *RadCom*) needed extensive maintenance work. A new tuning unit was necessary and I adopted a different mechanical and electrical solution. I would like to share with you the work done, all details of the antenna and some on-air results. I also include some comparisons with other, conventional antennas.

THE LOOP. The loop is not circular but square shaped. This choice was made because it was impossible for me to bend the copper pipes into a circle – I don't have the specialised workshop equipment. I therefore decided on a square shape, which also simplified transporting the pipes to my home. Calculation shows that the square shape has slightly reduced radiation efficiency for a given length of tube, but it is the simplest mechanically. Other shapes (octagonal, hexagonal or pentagonal) are possible, but joining together the sides of the loop causes reduced efficiency unless specialised welding or mechanical techniques are used. Keeping ohmic losses very low is of

paramount importance in building a short loop antenna. This is also the reason why copper is preferable to aluminium.

I decided to use copper tubing of 40mm diameter. This size is not so easily found; it is also possible to use 22mm tubing with reasonable radiation efficiency on the low bands.

For a true magnetic loop, the circumference must be one tenth of a wavelength or less in order to achieve constant current round the loop. A larger loop can also be used, with an increase in the radiation efficiency but some unpredictability in the polar diagram (because the loop then has a folded dipole mode in addition to the magnetic loop mode). The magnetic loop mode has maximum radiation in the plane of the loop (this is the mode used for direction finders), while the folded dipole mode has maximum radiation along the axis. As the loop circumference is increased above one tenth of a

wavelength by raising the frequency, the folded dipole mode slowly takes over, until it is fully established when the circumference is one wavelength. With the present loop, with sides of 2.5m, pattern purity can be expected at 3.5MHz and below, while on 7MHz it will be more omnidirectional as a result of mixed-mode operation.

The feed uses inductive coupling and

is based on RG8 or RG213 coaxial cable.

Figure 1 shows the complete antenna in diagrammatic form.

My loop has a total circumference of 10m including the capacitor connection cables. On 40m it has a circumference of a quarter wavelength. This length is not critical. The radiation efficiency is less at the lower frequencies. It is also possible to use the loop as a single-band antenna for the 40m band; in this case, the tuning capacitance required is small. The loop behaves as a magnetic loop on 160m and 80m and as a mixed-mode antenna on 40m.

CONSTRUCTION. The four sides must be connected by means of standard 90° copper elbows. Such components are normally used for water and gas installations and can be purchased from plumbing suppliers, as can the copper tubing.

It is preferable to solder the joints with a silver compound, also available in plumbing stores, using a good gas torch; great accuracy is required in doing this soldering operation to keep ohmic losses to a minimum. The ideal solution is a very high-temperature weld with oxy-acetylene, capable of melting copper and therefore with a perfect electrical continuity in the joints, but this is beyond the capabilities of the average radio amateur.

Another acceptable solution is to join the four elbows to the loop pipes by strong compression. This can be achieved by doing four longitudinal cuts 90° apart on each end of the elbows; the eight 'flaps' so obtained must be strongly

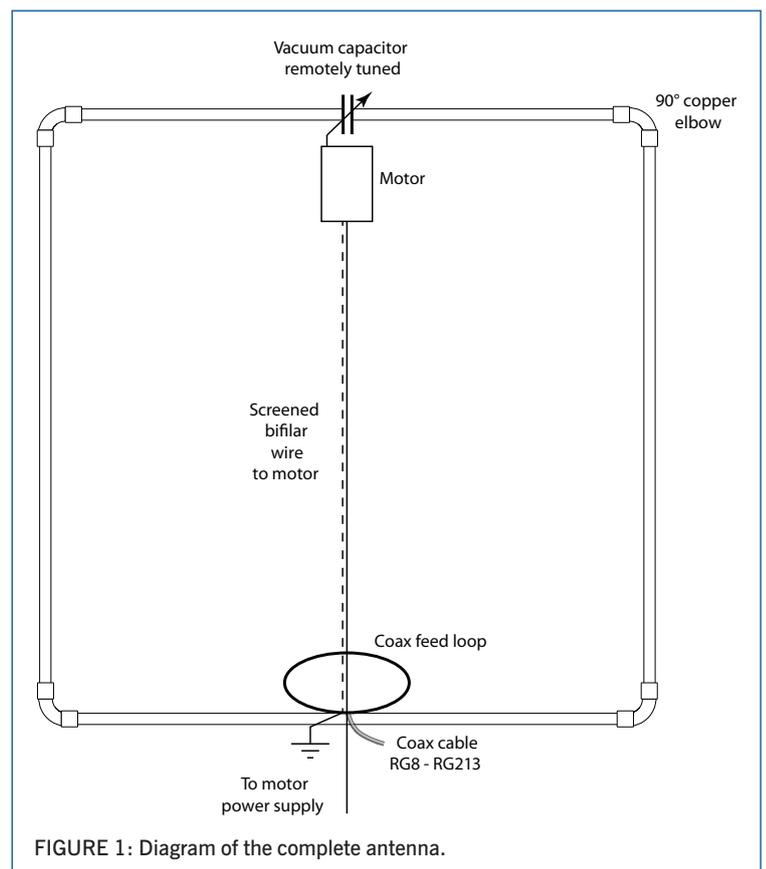


FIGURE 1: Diagram of the complete antenna.



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PHOTO 2: Prototype loop pedestal mount, rotator and feed.

compressed against the loop pipe by mean of a couple of large stainless hose clamps tightened fiercely over such ends. The surfaces to be joined must be given a thorough cleaning first. Afterwards, the connections must be weather-protected by wrapping them in self-amalgamating tape. I adopted a similar compression method to connect the tuning unit cables to the loop frame, described later.

To keep the loop sides parallel, the soldering/fixing operation should be done on a flat surface. The top 'side' of the loop must be cut at the centre, with a gap of about 100mm; a bar of Teflon or strong plastic is inserted and held inside the two free ends of the loop by a through-bolt to keep the structure rigid.

THE SUPPORTING MAST. For the mast I used an old windsurfing fibreglass mast, reinforced for about 1m with a tapered wooden dowel inserted from the bottom. If you are living in an area where windsurfing is popular, it is easy to find a discarded mast at low cost which is still good for this purpose. Alternatively, a thick-walled strong plastic conventional tubing (of dark colour) can be used as a supporting mast.

The windsurfing mast idea was originally adopted to allow rotation of the loop. It was necessary to include at the top of the mast a bearing cap connected to three guys at 120°, which permitted free rotation of the loop. The length of the windsurfing mast I used was right for this purpose and it worked very well for years, but I found it is not really necessary to rotate loop. The antenna acts like a direction-finder on ground wave at the lower frequencies, where it is a true magnetic loop, but on sky waves at the higher frequencies, when the loop operates in mixed mode, it is practically omnidirectional. I leave it up to you to decide whether you want to make the loop rotatable.

The lower external end of the mast must be inserted inside a thick aluminium pipe,



PHOTO 3: Detail of the Teflon bar connecting the loop frame ends.

bonded with epoxy glue and a through bolt. The length of this tube depends on the location - ground, roof, terrace etc. In my location, a flat roof, I adopted the pedestal solution shown in **Photo 2**. However the lower side of the loop should always be at a height of not less than 2m from the surface.

Now the loop must be mechanically connected to the mast. The lower side of the loop is fixed with a steel crossover clamp. I suggest a clamp normally used on external scaffolding by builders. Such clamps accept pipes with a diameter up to 45mm and are not difficult to find. Between the clamp and the copper tubing there must be a 300mm long split brass tubing before the clamp is tightened. This avoids buckling of the copper tubing under stress (and possibly increases the overall diameter if the clamp is too large for the copper pipe employed).

The other side of the clamp must be tightened on the aluminium base pipe. An alternative method to fix the loop could be the classic system for connecting a Yagi boom to the mast, using U-bolts and a thick aluminium plate.

The top side of the loop must now be fixed to the mast. I used two U-bolts placed along the mast and a thick Teflon plate to keep in the centre insulated bar of the loop top side in place (see **Photo 3**). A simpler alternative method could be a strong binding made with self-amalgamating tape. Two crossed strong plastic clamps must be tightened over this binding for a safer fixture. Finally, everything is bonded with epoxy glue.

THE TUNING UNIT. As the old tuning unit was out of order I was compelled to make a new unit. I decided to build it inside a standard watertight plastic box normally used for external electric circuits. Such boxes are available in electrical supply stores.

Obviously the size of the box depends on the size of the capacitor, tuning motor and other small components. I suggest outlining the various components on a sheet of paper and drawing the ideal size of the box required. The height of the components must also be considered. You can then buy the closest size of box.

To build the unit, first prepare a Plexiglas

board 3mm thick with the exact dimension of the inner bottom of the box, which will be the base for the whole unit. Trace the board centre line with a felt pen. This line must be strictly followed in placing and fixing the various components.

The first to be fixed is the tuning vacuum capacitor. I will describe my situation and you have to adapt it to your components. My capacitor is an Amperex vacuum ceramic capacitor of 7-1000pF, 7kV. It is kept in place by a large plastic clamp passing through the board and tight on top of the ceramic body of the capacitor. A square thick Teflon plate is inserted on the rotor shaft and fixed on the board by mean of two brass 90° angle brackets. This plate helps to keep the capacitor in place (see **Photo 4**). You must be very precise in drilling the rotor shaft hole in order to keep the capacitor shaft perfectly parallel to the track and at the right height, otherwise there are negative consequences. A brass ferrule with the correct diameter to permit a smooth shaft rotation must inserted in the Teflon plate hole and glued in place.

Now you can proceed to install the tuning motor. A small Plexiglas plate (the same type as the base board) must be prepared. A hole must be drilled to insert the motor shaft. Again great accuracy is required: the motor and the capacitor rotor shafts must be perfectly aligned. To do this more easily I suggest first fixing on the board two 90° angle brackets at the base keeping it temporarily on the main board in direct contact with the rotor shaft end, to determine the exact drilling point. Now you can fix the tuning motor to the board, but, before, you have to find the correct position on the base board, keeping in mind that a good quality flexible ceramic insulated ring must be inserted between the motor and rotor shafts (**Photo 5**). The rotor is RF-hot and must be very well insulated.

You can now drill the holes in the base board and tighten the nuts of the motor supporting base. Use stainless nuts, bolts and washers. With all the above operations completed, proceed to test the unit supplying power to the motor. Check this carefully: the rotation must be smooth, without any forcing, in both directions of rotation and with a quick change of direction.

For simplicity I did not include motor end-stop switches for the rotor, therefore I avoided such positions of the rotor both during tests and later during normal antenna use: the last tuning position must be remembered. I have used this method for a long time without problems. However, a simple empirical controlling system is to keep a milliammeter in series with the motor's power line in the shack. If the motor has difficulty in rotating, the current will increase suddenly. That's the clue that it must be stopped and the rotation direction changed.

The motor is a small DC unit with sufficient torque to turn the capacitor rotor. It is driven

with variable voltage from 6 to 12V. Another important requirement is the rotation speed, which must not exceed 2-3 rpm, otherwise it will be impossible to tune the antenna (due to the very narrow bandwidth of the loop). If your motor is faster it is possible to add a reduction gear on the shaft like those used in the past for fine tuning of receivers. Of course you have to consider the extra space required when planning

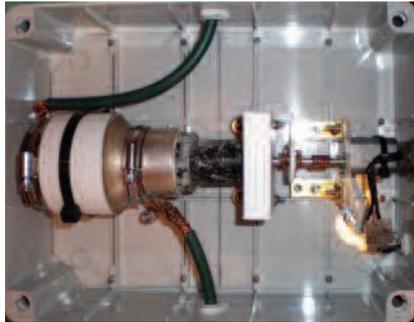


PHOTO 4: Inside the tuning unit. Note the Plexiglass sheet that acts as a chassis and the white Teflon block (see text).

the unit. It is also important to be able to control the rotation speed by varying the supply voltage. Use a lower voltage for fine tuning and a higher voltage for changing bands. The power supply must be variable; a switch between voltages is OK but a continuously variable voltage control is preferable. The motor control circuit diagram is shown in **Figure 2**. I bought my motor at a rally after it was recovered from an old computer printer. Of course another good possibility is the web.

Proceed now to build the collar flange system to fix the box to the mast. Four stainless bolts (100mm long and 6mm diameter) were used. The top side of each bolt must be cut off. You need now four stainless steel collar flanges with the right dimensions to accept the outer diameter of the loop supporting mast. Such flanges are available in large hardware stores (see **Photo 6**). You must drill four holes on the back of the box to accept the bolts exactly. The holes must be drilled at the correct distance of the corresponding fixing holes of the collar flanges.

Now temporarily place the unit base inside the box and drill it using the box bottom holes as a guide; later, the bolts will also keep the board in place. Be careful during this drilling operation to avoid damage to the tuning capacitor and other components already in place on the board. Now take off the base and proceed to tighten the nuts on the bolts inside and outside the bottom of the box.

A few layers of Teflon tape normally used for watertight connections in plumbing work must be wound on to the four bolts where they pass through bottom of the box. Then insert from both box sides a flat washer, a lock washer and finally the nut, which is then tightened. All hardware must be stainless. I strongly recommend a water tightness check of the bolts. The test is very simple: put some weights inside the box and have it float on water for a few hours. You will easily verify if a perfect watertight seal has been achieved.

You can now finally put in place the unit board, tightening the nuts on the top side of the board, using a flat washer, lock washer and finally the nut.

The next step is connecting the vacuum capacitor to the loop ends. You'll need to prepare two lengths of coax cable (RG 214 or similar, with double shielding) about 1m

long each. Remove the external jacket for about 250mm. Push the braid back against the jacket. Carefully open the inner copper foil, keeping it clear of the Teflon insulated inner conductor. Cut the inner away, gently flatten the copper foil, pull the braid back again and finally flatten it. You will obtain an excellent, flat, flexible conductor.

Now drill both side of the unit box at centre and mount the watertight cable glands of the correct diameter to accept the coax cable. Introduce the coax cables to reach the rotor and stator terminals of the capacitor. Wind the flexible cable ends carefully on the capacitor rotor and stator terminals so as to nearly complete one turn. Now insert over each terminal a large stainless steel hose clamp and tighten it hard – see **Photo 7**.

Connect the tuning motor to the DC supply line. Drill the lower side of the box and mount another watertight connector of the correct size to accept a twin screened conductor of the same type used in audio systems. This cable must later be dressed along the mast and have a length of not less than one meter below the lower side of the loop. From this point to the shack a normal conductor can be used but at the joint point the screens of the audio type cable must be grounded. Solder the line to motor contact lugs and bypass with 10nF ceramic disc capacitors. Both screens are connected to motor body and capacitors. In the shack the line is connected to a DPDT toggle switch and to the power supply. The switch can be mounted on a small plastic box for easy operation.



PHOTO 6: Detail of the collar flange on the back of the tuning unit box.

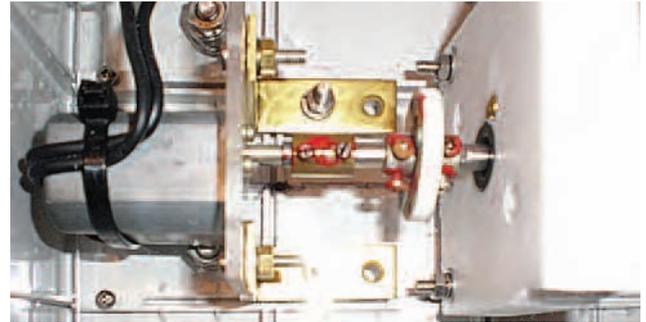


PHOTO 5: Detail of the coupling between motor (left) and capacitor shaft. Note the ceramic disc that insulates the motor from the (RF hot) vacuum capacitor shaft.

The unit is now completed and it should be fixed on the upper part of the mast, close to the loop centre gap. To support the tuning-unit box, fix a short 90° aluminium angle bracket just under the lower side, kept in place by a stainless hose clamp on the mast.

Now clean and polish the loop ends very carefully: the copper must be shining, without any trace of oxidation. Both coax cables of the tuning unit are to be bent with a rather wide radius so that they can reach the ends of the loop from the lower side. Cut the cables to the correct length to obtain a flexible end, in the same way as for the capacitor connections. Wind two turns of the flexible cable flat ends over the loop ends (see **Photo 8**). Insert two stainless hose clamps for each side of the loop ends and tighten them over the flat terminals of the cables.

Now the connections must be weatherproofed with self-amalgamating tape, starting from where the coax touches the loop. Stretch the tape and apply it in a half-lapped fashion to form a void free joint. The degree of stretch is not critical. To provide additional weatherproofing, split a length of plastic (heatshrink) tubing of greater diameter than the hose clamps and place it over the self-amalgamating tape area. Make sure that the join overlaps and will be pointing downwards when the antenna is erected. Secure the tubing using several nylon ratchet

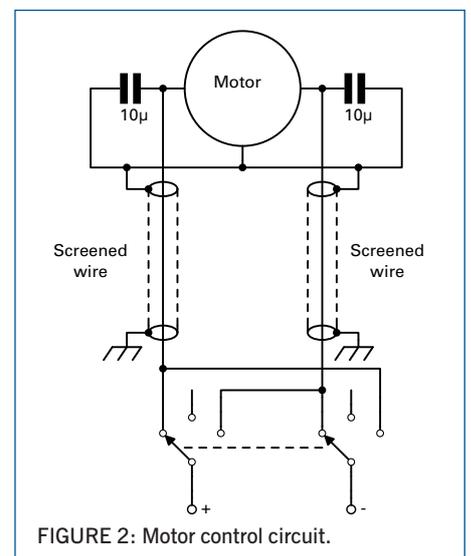


FIGURE 2: Motor control circuit.



PHOTO 7: Detail of the connections to the capacitor.

ties. It should look something like the right hand side of Photo 3.

Before closing the tuning unit watertight cover, make another test of the motor system by connecting the power supply at the end of the whole length of the feeding line. In closing the unit apply a thin layer of grease to the rubber fitting of the cover. Finally, apply at least two layers of marine grade varnish to the antenna: before this it is advisable to clean and polish the whole loop tubing; it should be shining without any trace of copper oxide. The mast and the tuning box should also be weather protected with the same varnish. Now the loop is ready to be put in place.

GUYING. Do not underestimate the weight and the wind-loading area of the antenna. A good guying system is required. I used three nylon guys at 120° from the top of the mast and another three guys from the upper part of the pedestal. The antenna survived for many years without problems, resisting gales very well. Use good nylon single wire and stainless turnbuckles for the correct tensioning.

Photo 1 and 2 show how to use a longer mast if you decide to make the antenna rotatable; a longer mast is required to obtain clearance of the guys for free rotation. The guys must of course be connected to a rolling bearing fixed on the mast top to permit rotation.

FEEDING THE LOOP. According to my experience, the best feeding method is by inductive symmetric coupling using RG8 or RG213 coaxial cable. I adopted the same design as that of the German commercial Loops AMA series by Christian Kaerlein, DK5CZ, later followed also by Hans Wurtz, DL2EA and others.

This feeding loop has a particular symmetric configuration, shown in Figure 3. The correct circumference must be determined experimentally to obtain the lowest SWR. The length should be approximately 1/5 of the length of the main loop. The coax line forming the feed loop is open at top centre. The braid on the input side of the opening is unconnected. The inner conductor and braid on the other side of the opening are shorted and grounded together with the braid of the

input side at the bottom. Affix the feed loop at the centre bottom of the main loop in the same plane and keep it close to the main loop conductor (see Photo 9).

Use two stainless steel hose clamps interconnected at 90° to keep the loop in place. Attach one clamp tightly to the aluminium pipe of the loop supporting mast. Screw the other clamp tightly to the lower terminal joint of the feed loop. Figure 4 shows the general arrangement. This mounting system ensures that all the bottom parts of the main loop and feed loop are grounded. An efficient earth connection is very important to obtain a low SWR and good antenna performance.

I suggest the following procedure to determine the right dimension of the feed loop. Testing should be done at 80m, as this is the middle band. You will have to use the tuning capacitor to tune the loop to resonance at the test frequency.

Prepare a length of coax a bit longer than calculated. Form the loop, soldering the lower side connections. Fix a PL259 plug at the input end. Now determine the top side centre and remove jacket, braid and insulation for about 20mm, leaving the inner conductor intact. Make a temporary connection of braid of the output side and inner conductor at the top and put the feed loop in place. With an antenna analyser (or simply with a SWR bridge and a low power transceiver connected at the base of the antenna), check the SWR. Compress the feeding loop top side downward - you should see a reduction of the SWR. This confirms that the circumference is too long. Now cut the centre top side and symmetrically trim the feed loop length on both sides of the top opening, then reconnect the parts.

Proceed in this way until you find the best SWR. Normally you should obtain a

1:1 SWR in 40 and 80m, a bit higher on 160m. Finally, you can permanently fix the feed loop to the mast after protecting the top with self-amalgamating tape and a plastic clamp the feeding coax line (RG8 or RG213) and the tuning motor power line must be kept vertical for about 1m under the low side of the loop, otherwise these conductors will tend to be coupled to

the main loop (with consequent difficulty in obtaining the lowest SWR).

OPERATING THE LOOP. To operate, bring the loop to resonance at the required frequency by operating the speed and polarity controls for the tuning motor. Do this operation at low power. The resonant point is reached when the SWR bridge meter shows a sharp dip: adjust the tuning to obtain the minimum reflected power. You can now increase the RF power; you may have to adjust the tuning again for the best SWR. It goes without saying that all the above operation must be done with the transceiver in tuning mode (CW or AM) to obtain a steady RF signal to read the SWR bridge meter. To avoid keeping the transceiver in the 'tune' position too long (and to minimise the radiated interference to other band users), it is most advisable to tune initially on receive (tune for maximum received noise) to bring the antenna close to the correct tuning point for transmission. With a little practice you will be able to do all tuning operations in a few seconds.

LOOP RADIATION EFFICIENCY. As I said at the beginning, an acceptable radiation efficiency for a short loop antenna depends on both a very low value for the ohmic losses of the system and from the shape and size of the loop. The radiation resistance of the antenna can be as low as a few milliohms. Bearing these parameters in mind, the ohmic loss is practically the only factor where it is possible to do something to improve the radiation efficiency.

Important factors are the quality and diameter of the conductor and the quality of the joints. Copper tubing of large diameter is important for good results as well as good quality in the joints, but the tuning capacitor must be considered the heart of the antenna.

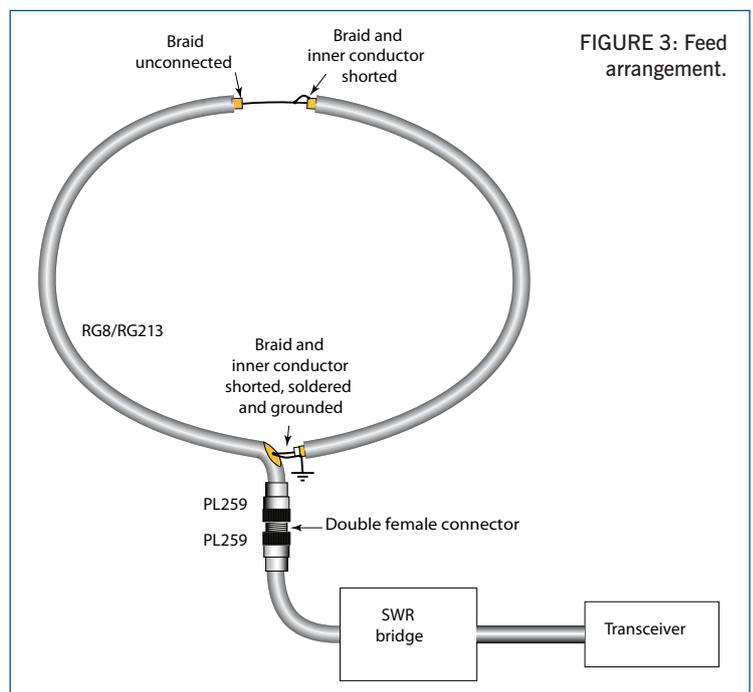


FIGURE 3: Feed arrangement.

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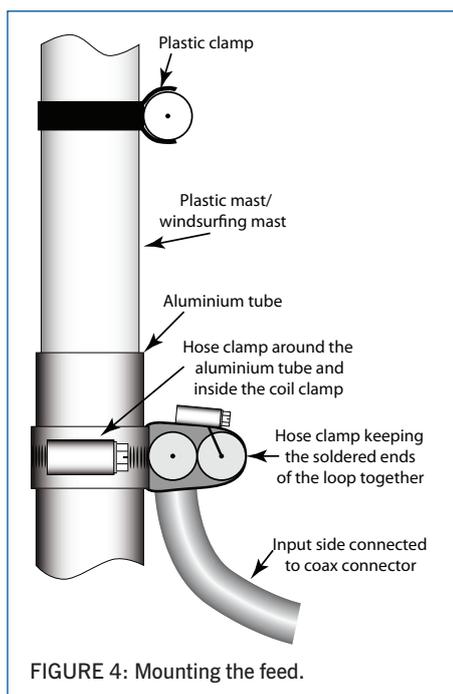


FIGURE 4: Mounting the feed.

For the low bands it is preferable to employ vacuum capacitors instead of conventional open capacitors, which are large and heavy because of the high capacitance required for such bands. The vacuum capacitor is certainly the most expensive part of the antenna, but with a good quality capacitor you are sure to obtain excellent results.

I suggest a research on the web to find such a component, as well trying rallies where acceptable prices can be found. Another important point is the RF power to be applied to the antenna. It is an intrinsic characteristic of small loops that *extremely* high RF voltages and currents are present. If you exceed the voltage limit you risk blowing up the capacitor in few seconds. Therefore forget the use of high power amplifiers, otherwise very, very high voltage capacitors are required. Such capacitors are rare and extremely expensive – and other insulation problems arise. The antenna gives good performance with the classic transceiver power of 100W. For this, the vacuum capacitor rating should be in the range of 5-8kV. The maximum capacitance should be about 1000pF if you intend to operate on Top Band, otherwise this value can be proportionally reduced.

COMPARISON WITH CONVENTIONAL ANTENNAS. When I began experimenting with the small loop, I was rather sceptical of the results to be achieved and I was motivated by curiosity rather than conviction. Soon I discovered the peculiarities of this antenna, which was quite different from other classic systems used during my long ham activity. I collected all possible information (very scarce at that time) to verify the real possibilities of this antenna and soon I wanted to compare the loop with conventional antennas.

One of the simplest systems for an average radio amateur to use to test an antenna is the



PHOTO 8: Using hose clamps to secure cables to the loop ends.

comparison method. This method is certainly not scientific but gives an indication of the performance of an unknown antenna relative to another, well known antenna. My conventional antenna was a classic monobander for 14MHz – a half wave dipole made in aluminium tubing, mounted on a telescopic mast 10m above my flat roof. The antenna to be compared was a 1m diameter loop of 22mm copper tubing, tuned with a motorised split stator capacitor. This loop was kept in place by a Black & Decker working table at about 1m above the floor of the flat roof of my house. The loop had a feeding coax cable of the same length of the dipole and both antennas presented a 1:1 SWR and the same orientation. The only difference was the polarisation: the loop was vertically polarised; the dipole, horizontal. In the shack, a switch permitted the quick switching of the two antennas.

I did tests with this setup for several months, operating both by day and night, with different propagation conditions, in transmit and receive mode – all without disclosing to my correspondents the type of antenna in use to avoid any possible ‘psychological’ influence. The power was less than 100W and the mode SSB. The test results were interesting. At a range of about 2000km the reports were practically the same, within a few dB. Sometimes the loop was better and sometimes slightly worse: on averaging the results I concluded that there was parity between the two antennas. For longer range (and in particular for DX) the dipole was definitely better, with differences between two or three S-points, nevertheless, I was able to make many contacts all over the world with this small loop.

Concerning the square loop for low bands, it was not possible to compare the antenna with a dipole without the space to erect such an antenna, but it compared with a vertical antenna for the 40m band. The results are very similar to the above. On relative short distance I constantly receive the same reports with the vertical antenna but in some instances the loop was better. Without too much effort I succeed also in transatlantic QSOs, showing a good radiation efficiency on this band, as expected. Reports at medium range are most of the time around S9.

On the 80m band no comparison was possible but the reports obtained are quite



PHOTO 9: The finished feed.

remarkable at 500km range, with figures between S9 and 20dB over 9. Also, Top Band surprised me very much. The calculated efficiency is quite low, as the loop is only 1/16 wavelength: nevertheless, I was able to make excellent contacts, mostly around 300km with reports of 10dB over 9. I had QSOs with almost all European countries. The bandwidth drops dramatically, reaching a value around 2kHz on 160m, making tuning critical: such operation must be done at a minimum motor speed. The people I worked were very surprised to learn of the type of antenna in use. In receiving mode the loop is excellent: it is possible to copy low signals without difficulties due to the antenna's low noise characteristics.

In any case it must be noted that on the low bands it is much more difficult to erect classic wire antennas half wave up over ground and, therefore, a good short loop can often win the competition because it is keeping an acceptable radiation efficiency at a very low level over ground due to the intrinsic magnetic characteristic of the antenna in the near field, which makes it less subject to ground losses.

CONCLUSION. In my opinion the short loop can be considered a good alternative when is impossible to erect efficient conventional antennas for the low bands. However, an efficient loop is not so easily built: you need excellent components and accurate mechanical and electrical handiwork; otherwise the risk of disappointment is high. Furthermore, it is rather annoying to have to tune the antenna every time you change the frequency by even a few kHz, but this can be also considered an advantage because the loop is acting as a filter on both transmit and receive. Another advantage is also that a loop this size may open the possibility of Top Band experiments, perhaps for the first time in your ham life, as happened to me.

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Wavecom W-Code

Powerful data analyser and decoder system



BACKGROUND. Wavecom have been in the radio data decoding business since 1985. The Swiss based independent company has gained a formidable reputation and has government agencies, defence organisations and telecommunications operators as its major customers.

WHAT IS W-CODE? *W-Code* is a comprehensive decoding and analysis software package for radio data systems from VLF through to the satellite bands. In the early days of the company, all their decoding systems came with dedicated hardware input devices that were either external to the computer or used internal PCI/PCIe slots. However, the general improvement in soundcard quality has enabled the release of the software only option that I'm reviewing here. The *W-Code* software (version 8.0.00) is supplied on a single CD-ROM and uses a CodeMeter USB dongle to provide the copy protection. As a result, the software will only run when it has access to a CodeMeter with the appropriate up-to-date licences installed.

INPUT SELECTION. One of the many strengths of *W-Code* is its versatility and this shows up particularly well in the way input sources are managed. All the input sources are handled via a *W-Code* server that runs as a Windows Service. The *W-Code* server is extremely

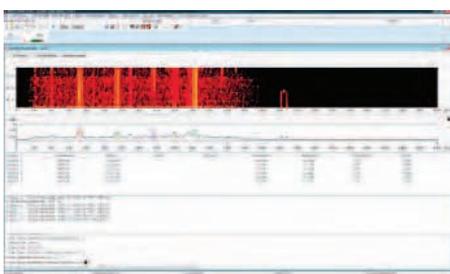


FIGURE 1: Examining PSK-31 signals on 14.07MHz.

versatile and can handle inputs from many sources ranging from a local soundcard to a remote, Ethernet connected, device.

AUTOMATED DECODING. For many, one of the initial attractions of *W-Code* is its fully automatic analysis and decoding of a wide range of digital signals. This is achieved using the Classifier and Code Check feature that examines an input stream, spots data-like signals in the input band and identifies the transmission mode

for each signal. Following identification of the basic transmission mode, the analyser parses each signal in turn to identify the specific variant. For example, when examining PSK-31 signals on 14.07MHz (See **Figure 1**), *W-Code* initially classified the signals as PSK-2A. It then moved on to examine the code and determined that the signals were in fact PSK-31. This type of identification is not an exact science as there are many signals that appear similar, especially when idling. *W-Code* deals with this by using a confidence factor that shows the percentage certainty of the mode identification.

The classification process operates by comparing the measured signal parameters with its own database of signal characteristics to find the best match. The signals database is held in XML files and there were separate files provided for the HF and VHF/UHF bands. If you need to add a new mode to the classification process, all you have to do is add the main transmission parameters, ie speed, shift, alphabet, etc to a new entry in the XML file. The initial classification process was extremely fast and was generally able to handle all the signals in the audio pass band in under a second, which was impressive. The code checking was a little slower as the decoder needed to gather a decent sample of decoded data before assessing the result against its stored code tables. The identification

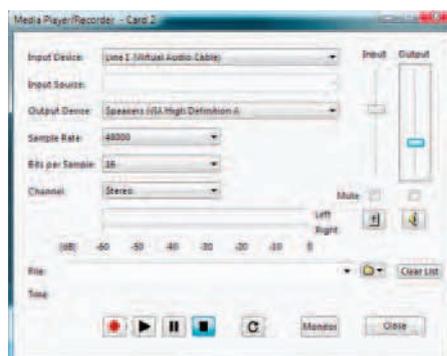


FIGURE 2: The configurable media player/recorder.

process worked extremely well throughout the review, though you do need to take care to provide a clean signal at the appropriate level for the analyser. I was using a WinRADiO Excalibur Pro SDR receiver for the review so I was able to optimise the filtering for each signal and thus present *W-Code* with a good quality signal.

Once a signal type has been detected, the software can be configured to automatically start the appropriate decoder and display the decoded output on the screen! At this point I ought to make it clear that being able to decode the signal and reading the message content are two very different things. *W-Code* facilitates recovery of the original modulating signal or data. However, the original data may have been off-line encrypted to protect the message content. By off-line encryption I mean encryption that is applied to the message before it reaches the transmission system. Whilst you can read the content of open and simple systems such as amateur modes, weather broadcasts, etc, the majority of military, government and other agency traffic will be encrypted. That's not a problem for the professional user as *W-Code*'s role is to handle radio decoding of the intercept so the data can be passed to other specialist applications for decryption.

SIGNAL ANALYSIS. Whilst *W-Code*'s automated decoding can be very useful, most professional users of *W-Code* will be attracted by the wide range of receive modes and the powerful analysis tools. There are way too many modes to list here; I counted 166 in the manual and the full list can be found on the Wavecom website at www.wavecom.ch. The software is regularly updated, so you can be sure that new modes will very quickly be incorporated into the code. During the review I tested many of the *W-Code* decoders and they worked extremely well. When it comes to signal analysis, *W-Code* really shows its power and includes just about all the tools required to take any signal apart. The supplied tools are excellent for identifying mystery transmissions but also serve as very useful diagnostic tools for checking transmission quality.

One of the most useful basic tools provided by *W-Code* is the configurable media player/recorder (**Figure 2**). When analysing a new

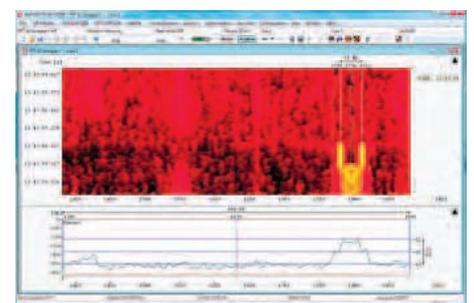


FIGURE 3: The combined sonogram and spectrum analyser.

signal it is standard practice to first of all capture a clean recording of the signal and so avoid the problems of working with a live signal. The *W-Code* Media player provides that facility and allows input selection from any of the installed devices on your PC. You also have options to control the recording sample rate and number of channels. A nice touch is the provision of a signal monitor that can be set to send an audio stream to your PC speakers, or any other output device. This monitor feed has its own level control so you can adjust the volume without affecting the main feed into the decoder software. To complete the media player facilities, there's a loop control so you can set the player to continuously loop the recording whilst you carry out analysis work.

I've shown as example of the combined sonogram and spectrum analyser in **Figure 3**. These tools are often the starting point when examining a new signal as they provide basic information on signal levels and bandwidth. The example in **Figure 3** shows *W-Code* being used to examine the characteristics of a PSK-31 signal. You will note that the fine resolution of the display makes the measurement of narrow band signals very simple. To help with critical measurements, the display can be frozen whilst you place the cursor precisely over the section you want to measure. Once you've established basic information for the mode, you can move on to one of the combination analysers that have been setup to deal with specific mode groups.

In **Figure 4** I have shown the FSK analysis panel that contains tools for establishing the bandwidth and baud rate more precisely. The lower part of the display is a sonogram representation of the upper parts. The displays can be zoomed and in this example I'm looking at a 45.45 baud amateur RTTY signal. The only confusing point here is the baud rate showing as 90 baud, ie twice the actual rate. This is explained in the manual and occurs with any asynchronous FSK system that employs half bits in the code, ie RTTY with 1.5 stop bits.

A similarly useful analysis panel is available for MFSK signals (**Figure 5**). This shows a conventional sonogram in the lower panel with a high speed tone analysis in the top panel. This high speed analysis is very revealing as the left-hand section shows spikes that are proportional to the number of occurrences of specific tones, whilst the main display shows a detailed view of the individual tones employed by the signal. This display can be frozen to facilitate detailed measurement of the tone frequencies, spacings and timings. This tool in particular makes MFSK signal analysis a pleasure, as you can see from the ROS16/500 signal shown in **Figure 5**. Next comes the PSK analysis panel (**Figure 6**) and here *W-Code* provides a sonogram and a symbol rate display. The example shows an amateur QPSK63 signal and the large peak in the symbol rate display

at 63 baud is clearly visible. Also linked to the PSK analysis is the Phase Plane display that shows a phasor diagram of the PSK signal.

Figure 7 shows the analysis of a QPSK63 signal, where you can clearly see the four points of the modulation. Completing the HF analysis panels is the STANAG Code Check that does a very good job of quickly identifying the complex signals in this grouping. All these analysis tools were also available for use with VHF/UHF and satellite signals.

To ensure measurement accuracy *W-Code* has an inbuilt calibration facility that compensates for errors in the soundcard's sample rate clock. Calibration is a simple process that requires tuning into one of the many standard frequency transmissions and using *W-Code*'s alignment tool to adjust the screen pattern until it is exactly vertical. The correction factor is automatically stored and used for all future measurements. The quick and simple calibration process was very welcome and helps ensure continuing accurate measurement.

BIT ANALYSIS. *W-Code* includes a number of specialist tools for examination of the recovered bit pattern. These are particularly useful when examining unknown signals. The Bit Length tool is very helpful as it can freeze a data signal and allow you to take precise measurements of the recovered waveform (see **Figure 8**). This is good for calculating the symbol rate of signals as you can usually establish the symbol rate from the width of the shortest element in the code. You can see from **Figure 8** that, in addition to giving a read-out in microseconds (μ s), it also provides an automatic conversion to baudrate. Other tools in the bit analysis range were auto correlation and bit correlation. These come into play after the basic parameters of the signal have been established and you need to work-out bit patterns and repetition rates. There was also the facility to send the demodulated bit stream to an external application for processing.

SUMMARY. *W-Code* is a very powerful and refined collection of specialist decoding and analysis tools that provide all you need for the examination of a wide range of radio data signals. Although I have focussed on HF signals in the review, *W-Code* is equally happy dealing with signals in the VHF/UHF and satellite bands. The measurement resolution and ease of use was excellent and I particularly liked the facility to freeze the displays whilst taking measurements.

As you might expect from such specialist measuring software, *W-Code* is not cheap and the option set reviewed here is priced at CHF 8,500 (approx £5,700). For more details please contact Wavecom direct via their website at www.wavecom.ch. My thanks to Wavecom for the loan of the review copy.

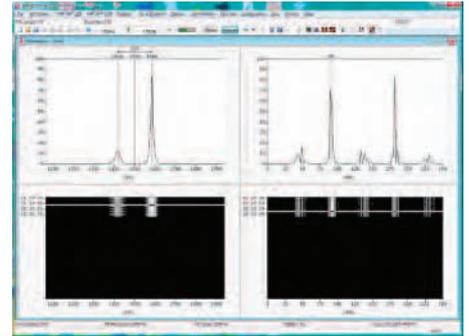


FIGURE 4: An FSK analysis panel.

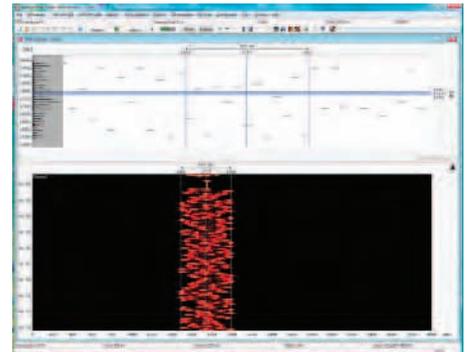


FIGURE 5: An MFSK signal analysis panel.

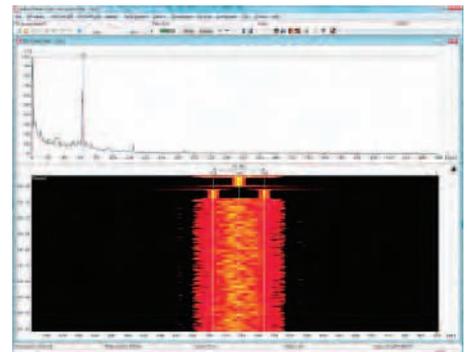


FIGURE 6: The PSK analysis panel.

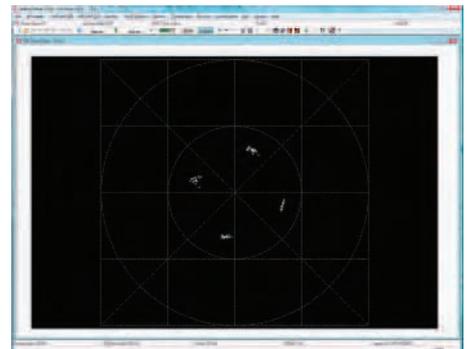


FIGURE 7: The analysis of a QPSK63 signal.

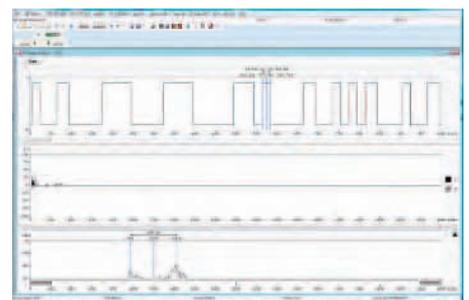


FIGURE 8: The Bit length tool allows precise measurements of the recovered waveform.

Digital HF VSWR meter

Completing the LCD and LED versions



PHOTO 9: The LED bargraph version of the VSWR meter.

PCBs. The foil patterns for the sense head and PIC board are shown in **Figure 5**. Note the reversed text next to the scale mark. This should read the right way round on the actual PCB – we've reproduced the boards in mirror image to make it easier to photocopy the pattern onto acetate and use that as a mask for UV exposure. The PCB patterns can be downloaded as graphics and CAD/CAM files from [1].

CONSTRUCTION. The component overlay for the boards is shown in **Figure 6**. The construction of the sense head board was described last month.

The board with the PIC is of fairly standard construction with all the components mounted on the top side. The PIC is mounted into a 40 pin DIL socket, whereas most of the remaining components are soldered in circuit. In the prototype the three LEDs are soldered to the rear of the PCB and protrude through the front panel when completed. This PCB is attached to the side wall of the die-cast box with an L shaped bracket (**Photo 10**) made from 1.5mm aluminium sheet. This serves to mount the board, but also to conduct any heat away from the 5V regulator, although only negligible heat should be produced. There are five wire links on the board, one of which is positioned under 40-way socket for the PIC.

The connection between the LCD and the PIC board requires 20 conductors. In the

prototype this was made with two 10-way plug and socket arrangements.

CHECKING. After constructing any circuit it is prudent to check over the board for correct orientation and placement of components, also for any problems encountered with soldering, including solder bridges or dry joints. This is where a simple check can so often prevent later heartaches.

When powering up the completed unit, use a current limited power supply at 60mA, or a 12V source with a 220Ω 1W series resistor. Should a fault that is likely to draw high current be apparent,

the series resistor will limit the fault current to approximately 55mA.

CALIBRATION. All of the adjustable components are on the sense head. The first thing to do is set up the balance of the bridge by adjusting C2. To do this, connect the sense head between an HF transmitter running full power (not over 200W) and a suitably rated, good quality dummy load. Measure the voltage on the RF head's reverse power output and adjust C2 for minimum reading – ideally 0V (the minimum on the prototype was 68mV). The setting of C2 can be accomplished either with the casing removed from around the circuit, or with a small hole drilled in the die-cast box and the use of an insulated trimming tool employed. The latter approach was adopted for the prototype unit.

The second part of the calibration is to set up the forward and reverse voltage levels that feed from the sense head to the PIC board. These are adjusted by P1 and P2 and can be set up in one of two different ways: using a diode detector or by comparison with another VSWR meter.

A simple diode detector can be used to measure the actual output of the transmitter at the dummy load. A suitable circuit is shown in **Figure 5**. Measure the voltage output V of the diode probe: this will indicate the RF peak value. The RMS power, in watts, is calculated as $P_{RF\ RMS} = (0.707 \times (V + 1.4)^2) / 50$. For example, 30V on the DVM would indicate

an RF power of 14W. This circuit is only suitable for input powers of up to 40W or so (that's about 50V on the DMM).

Use the diode detector to set up a CW transmitter output of 20W (DMM reads 37.5V) at 3.625MHz. Adjust P1 so that the SWR meter forward power reads 20W on the LCD. Now use the DMM to measure the voltage on the RF sense head PLG5 pin 1 and write this value down. Now swap over the RF connections to the transmitter and the antenna – this allows reverse power indication to be set up. Apply the same RF power and frequency and measure the voltage at PLG5 pin 5. Adjust P2 so that the voltage is the same as that noted for PLG5 pin 1. Ignore any messages on the LCD display. This completes the first calibration method.

The second method to calibrate the unit is to connect a second VSWR meter in series with our VSWR meter and adjust the presets P1 and P2 to match the calibrated unit. P1 is adjusted such that the indicated forward power on the LCD matches the value of the forward power on the calibrated VSWR meter. Again, monitoring the voltage on PLG5-1 on the VSWR in the proper configuration (transmitter and load connected to the correct sockets) the voltage can be noted for this level of power. Connecting the meter the 'wrong way around' again, P2 can be adjusted so that the output voltage matches PLG5-5 the voltage in the correct configuration at PLG5-1 in the previous test.

A NOTE ON SAFETY. It is worth noting that this unit is perfectly safe to use. However, with any radio transmitting device a certain amount of respect has to be given to the use of these devices, since the voltage and currents used can be regarded as being of lethal proportions. The transmitter may work from a 12V DC supply, but it can generate an RF voltage of 100V or more and RF currents of over 1A. These can cause nasty burns. A good deal of care has to be observed when dealing with radio equipment and the risk of electrical shock is real. Never remove or attach coaxial connectors when the transmitter is transmitting, except under exceptional circumstances, where perhaps life may be at risk. But in those circumstances always switch off the equipment from their supply first.

EXTENDING THE USE OF THE UNIT.

On the main PCB the inclusion of R19 and R20 in parallel with the two analogue

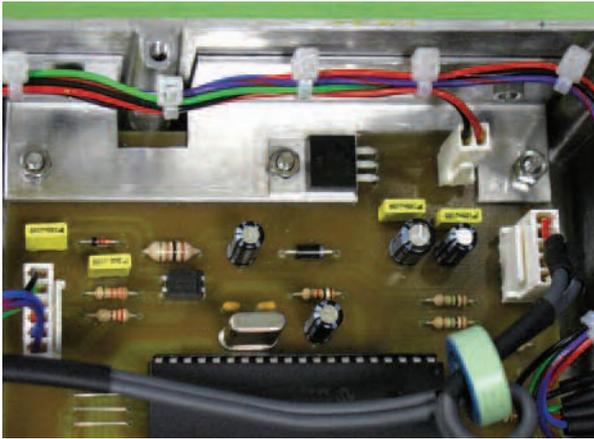


PHOTO 10: The PCB mounting bracket also serves as a heatsink for the voltage regulator.

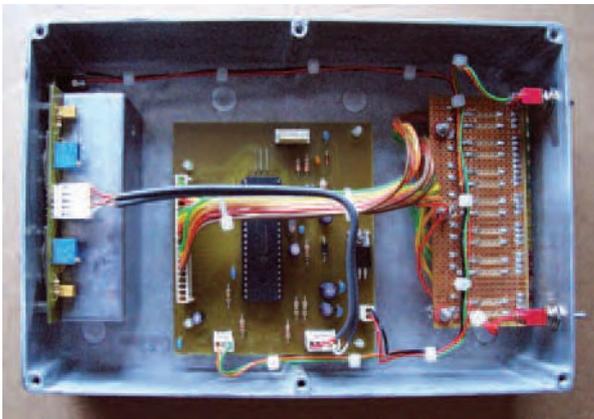


PHOTO 11: Overall view inside the LED VSWR meter.

inputs to IC2 was considered for two reasons. First to protect these two inputs from static charge in handling and service. Also should the unit be used with additional switchable RF sense heads, this will tend to reduce any stray voltage induced into the two analogue inputs during switching between heads.

This unit was designed primarily for HF, this being 1.8MHz to 30MHz and works well within the HF band and additionally to 72MHz. The use of an alternative additional calibrated head can be utilised to monitor more than one transmitter/antenna, using a toggle or rotary switch to select the additional heads. Possibly an additional transmitter output on another band to augment the unit, or a high powered unit or indeed a low power unit (QRP). This is not covered in this article but has been considered for further thought.

Measured loss through the device with laboratory test equipment is under 0.15dB throughout the whole frequency range of 1 to 100MHz, as shown in **Figure 8**. The VSWR introduced again throughout this whole range of the meter alone is less than 1.05:1, shown in **Figure 9**.

THE LED VERSION. I was very satisfied with the LCD version of the VSWR meter, but found I needed a second version with a lower power rating for portable use. I wanted a means to display approximate

forward power and VSWR for this situation and, if needed, the same facility to dump power if the VSWR gets too high. This dumping facility was not actually crucial in this second design, however the facility was kept in.

Instead of using an LCD to show power and VSWR I took the option to make up an LED bargraph. The bargraph display indicates 10 to 120W RF in 10W increments, plus an indication of over power. VSWR is indicated from 1.0:1 to 2.0:1 in ten steps, plus 2:1 and 3:1. VSWR or forward power mode is selected with the aid of a toggle switch.

I decided to include a LED to indicate errors; this error could be either the coaxial connections to the meter being connected the wrong way around, resulting in a negative value of VSWR. Under this circumstance the alarm LED will flash four times, pause and repeat the flash cycle until the RF power is removed and the connections reversed. In the case of very high VSWR occurring, the external relay output permits dumping the transmitter output into a safe load, this function having a latching action. The power dumping function runs in parallel with the function

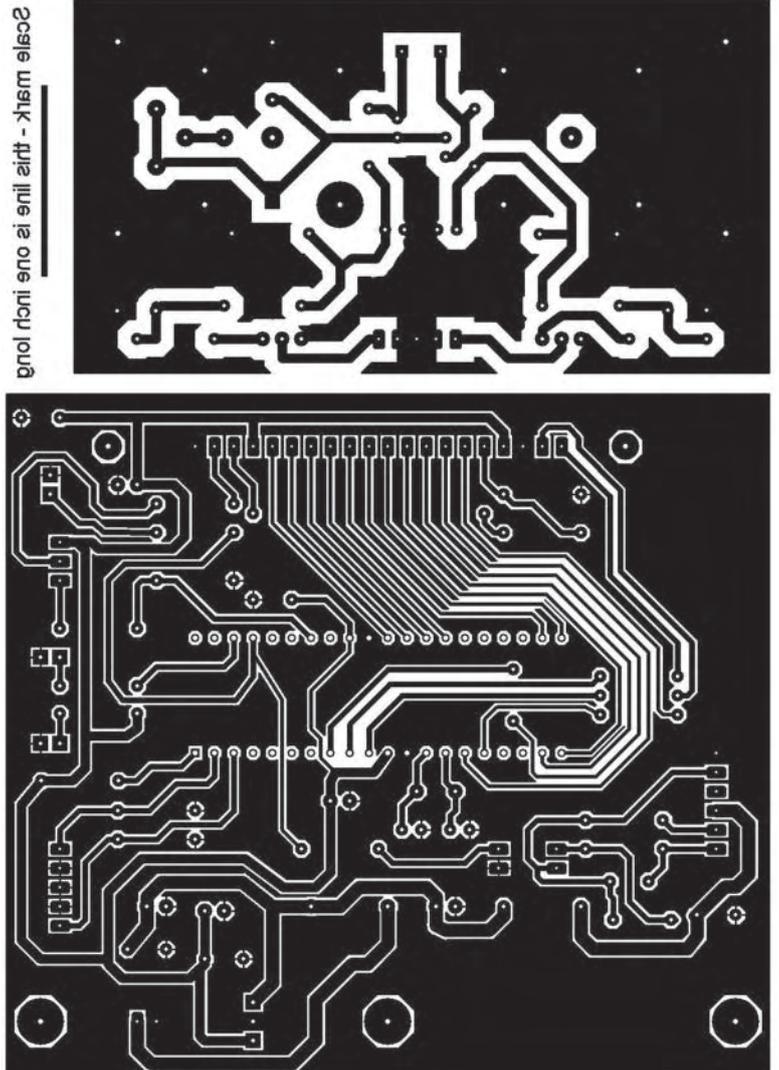


FIGURE 5: PCB foil patterns, reproduced actual size.

of LED 13, when illuminated in VSWR mode the optional power relay is energised.

THE CIRCUIT. The full circuit diagram of the LED meter is shown in **Figure 10**. Similar components and component values are used as in the original LCD meter, with a few exceptions. The components associated with the LCD of course need not be included, also component values associated with the sampling of the current bridge need to be changed to deal with the lower power rating.

The same PCB designs are used as the LCD version. The multi-way connector is used to connect the larger PCB containing the PIC microcontroller to the bargraph LEDs. In addition to the RF head assembly and the microcontroller PCB the LED bargraph is fabricated on 0.1 inch copper clad stripboard.

Power to operate the unit can either come from a set of internal batteries or as in this case from an external 12V source. The current drawn here is in the region of 40mA maximum without the relay option being included.

CONSTRUCTION. The unit is fabricated in a die-cast aluminium box, measuring 220mm by 145mm by 55mm high. A slot is made in one end to accommodate the bargraph LEDs. Holes are drilled under the bargraph slot for the two toggle switches; one switch for powering the unit, and the other switch to select the bargraph mode of indication; either forward power (RF) or VSWR. Another hole is drilled beside the RF connectors to accommodate the DC power in socket. **Photo 11** shows how everything fits together.

There are two SO-239 sockets on the head assembly and these protrude through 20mm holes drilled in the rear part of the case. This assembly is mounted to the rear of the die-cast box by four drilled out spacers (M3.5 clear) to accommodate the M3.5 screws in the die-cast box. The original countersunk screws were not used. Longer pan head screws were sourced to mount this assembly off the back surface of the die-cast box with the spacers.

The LED bargraph assembly is fabricated on strip board with the associated current

limiting resistors; these are soldered to this board. Terminal pins are used to connect a multi-way ribbon cable to the microcontroller board. This circuit is attached to the enclosure with the aid of three 25mm long M3 countersunk screws. Three nuts are positioned on each screw, one nut to lock down the screw to the case, and two additional nuts to align the height of the bargraph assembly to the display slot. Three fibre insulating washers are used on the track side of the strip board; this provides additional isolation of the circuitry from the metal case. **Figure 11** shows the component overlay and X represents a break in the copper strips, which run across the short dimension of the board. **Photo 12** shows the completed LCD display board. The LEDs used in the prototype are of the variety where they can be slotted together side by side. Since in each plastic housing there is a male and female keyway to assemble a tight row of LEDs. To make the LEDs sit snug to the stripboard, notice the connections are made in groups of four soldered

connections, a one row space, and then another four connections, LED1 to LED12. There is a gap between LED12 and LED13 of three rows.

The RF head assembly is fabricated in exactly the same way as the LCD version. However, for my LED version I chose to use a Micrometals T50-52 core. The winding and construction is the same as the procedure described last month. Calibration is exactly the same as described earlier.

IN USE. There are some slight operational differences between the LED and LCD versions of the meter. This version works in one of two modes: RF Power or VSWR.

RF Power Mode. In this mode, when no RF power is applied the only LED to illuminate is the Power LED (LED14). Applying RF power causes the LEDs to illuminate in bargraph fashion, indicating increasing power in 10W increments. The maximum power indicated is 120W. In digital modes

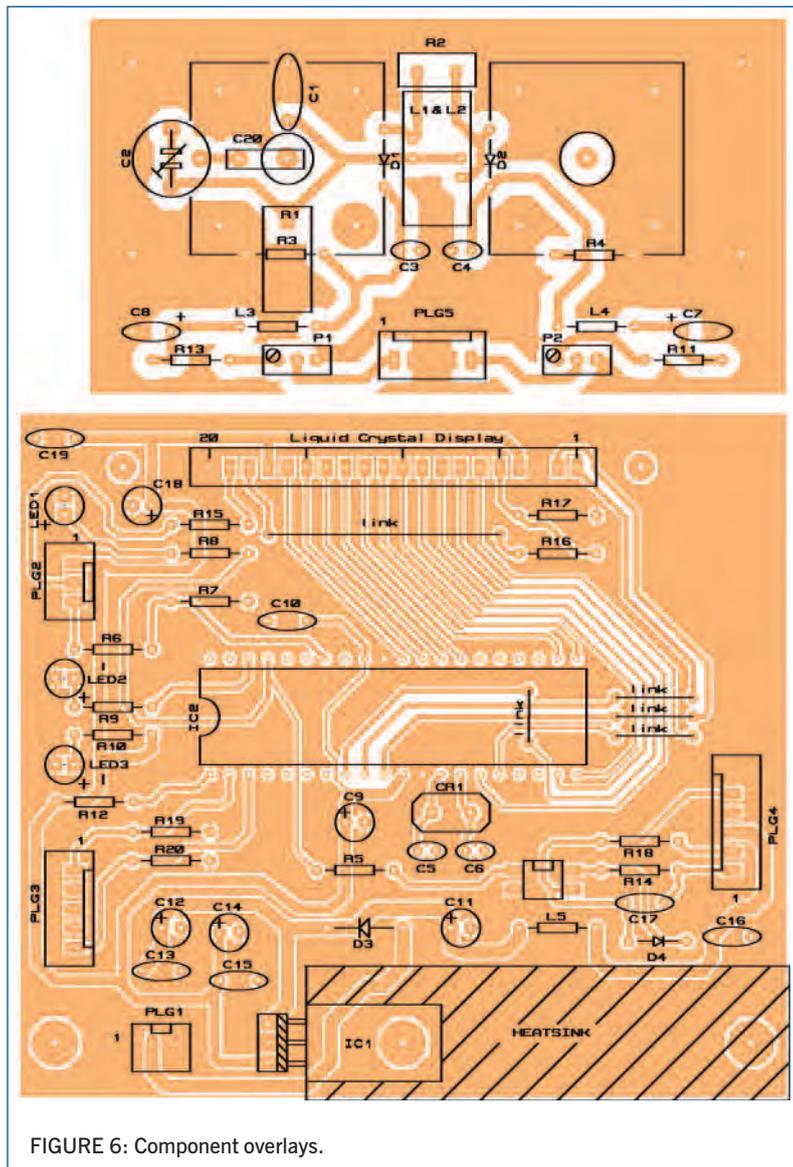


FIGURE 6: Component overlays.

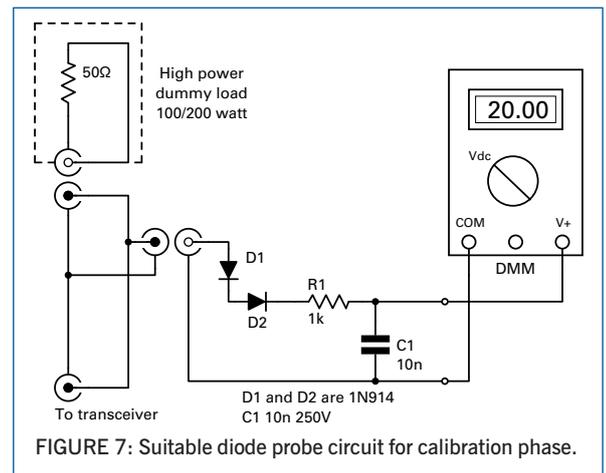


FIGURE 7: Suitable diode probe circuit for calibration phase.

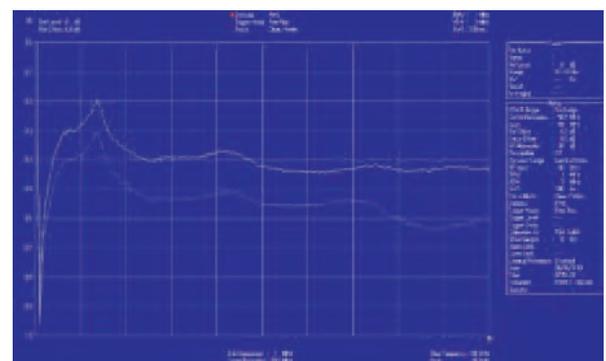


FIGURE 8: Insertion loss of the VSWR meter, 1 to 100MHz.

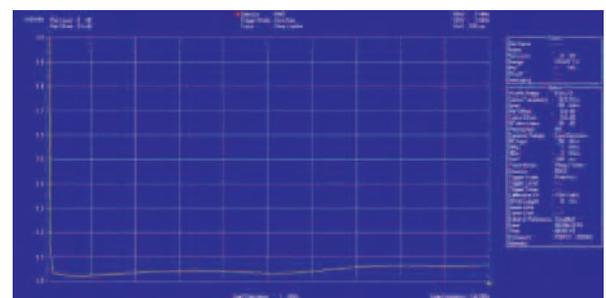


FIGURE 9: VSWR of the VSWR meter, 1 to 100MHz.

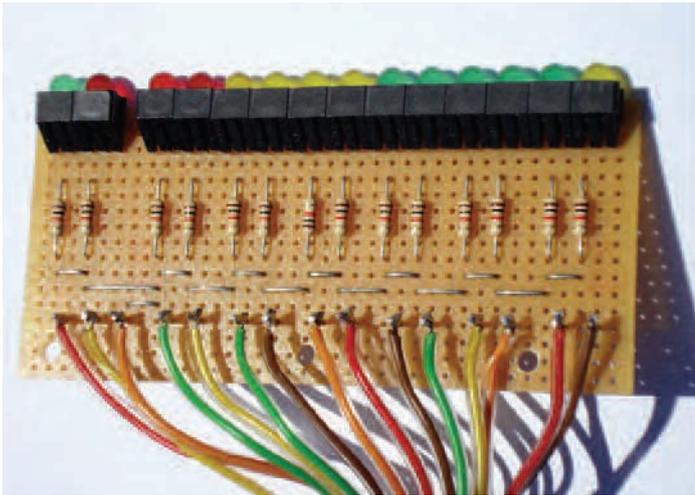


PHOTO 12: Completed LED display board.

LED VERSION COMPONENTS

Most of the components are the same as for the LCD version, with the following changes:

- R8, R9, R10 and the LCD display are not fitted
- R21-R34 1k
- LED1, LED7-LED10 5mm amber
- LED2-LED6, LED14 5mm green
- LED11-LED13 5mm red
- IC2 will need to be programmed with the LED version of the software.

All software and PCB layout files can be downloaded from the *RadCom Plus* website, www.rsgb.org/membersonly/publications/radcomplus/index.php

and the alarm led (LED13) will flash four times, indicating this fundamental problem. The alarm LED will cycle through the flash sequence until the RF signal ceases, the connections can be changed to their correct orientation. In this mode the reset to normal operation is automatic.

In VSWR mode, the same condition of connector reversal will be shown with the 3:1 VSWR led

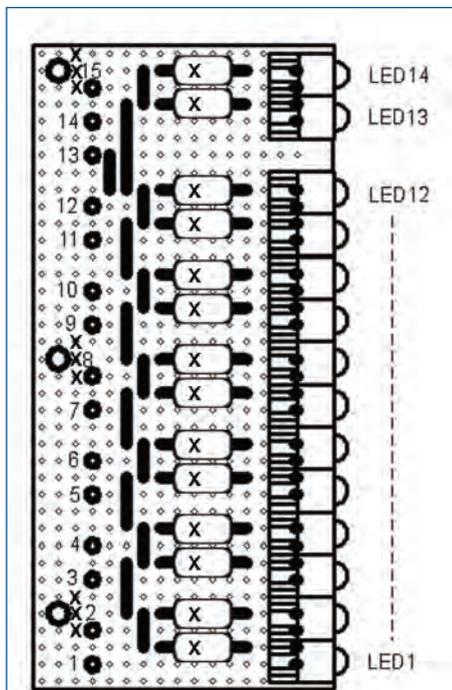


FIGURE 11: Overlay of the LED display board. X indicates breaks in the copper tracks, which run horizontally as shown here.

power in this mode the VSWR is indicated on the bargraph in a similar manner as indicating RF power. The LEDs indicate a VSWR from 1.0:1 in 0.1 increments to 2.0:1, and from then to 3.0:1 in one giant step. The reason for indicating the accuracy of VSWR to this degree below 2:1 is that it is often felt that an antenna with a VSWR of less than 1.5:1 is regarded as a good match. Since at this level only 4% of forward power is reflected back with a VSWR of 1.5:1, 2:1 – 12% reflected. A VSWR of 3:1 should always be avoided as this could cause damage to the transmitter final output components, as this equates to 25% reflected power.

When a VSWR of over 3:1 has been read by the meter, the alarm LED (LED13), indicated on the prototype with a “!” will illuminate. This will remain lit even after the VSWR has reduced below this level, or the RF power has been switched off. It was thought best as 3:1 could be regarded as a fault condition and this apparent fault condition should be made aware to the user of the meter. Resetting is just a simple matter of flicking the VSWR/RF power switch out of VSWR to RF and back into VSWR again.

ALARM. Should the meter in RF mode be connected the wrong way around, the meter will signal what it considers to be a negative value for VSWR,

illuminated and the alarm LED, both being constantly on. Reset in this mode is initiated by flicking the VSWR/RF switch to the RF position and then back to VSWR.

CONCLUSION. The meter has been in use initially at the home station and out in the car as part of portable equipment. Whilst the VSWR can be monitored on the meter, the RF output power from the transceiver can also be monitored on the transceiver’s own integral meter, or vice versa.

Measured loss through the device was very similar to that seen with the LCD version, which is not surprising as the sense head design is so similar.

A note regarding the values of C7 and C8, which can be any value between 2.2 and 47µF, depending upon the desired use of the meter. The higher the capacitance of these components, the longer the time constant of the circuit. The longer time constant would be ideal for data modes where the audio level is likely to vary sharply.

such as PSK31, Olivia, Hellschreiber and a number of other digital modes three, four or maybe five LEDs will be illuminated at the one time. This is due the fast sampling rate of the circuit responding to different levels of modulation in that digital mode. In digital modes the modulation and hence the RF power varies during the course of the transmission. This effect won’t be as apparent during turning up the transmitter, Antenna Tuning Unit, antenna or when using speech transmissions. Take the peak LED illuminated as the peak power.

VSWR Mode. In this mode, VSWR is constantly measured. The 1:1 (perfect match) LED (LED1) is illuminated when there is a VSWR of 1:1 or when no RF power is being applied to the meter. Applying RF

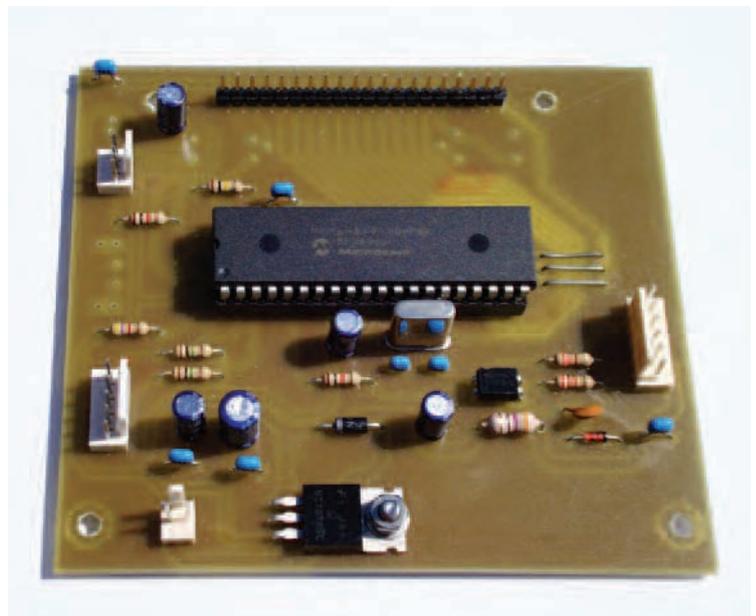
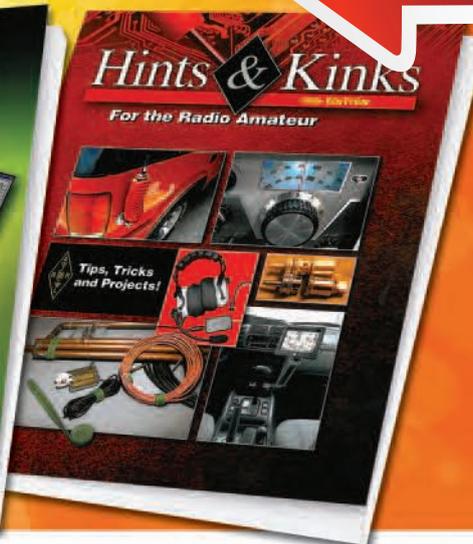
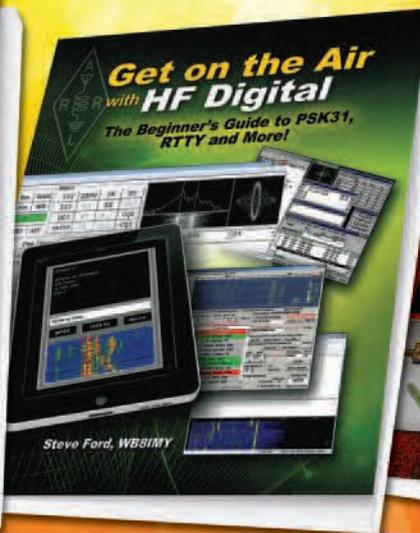
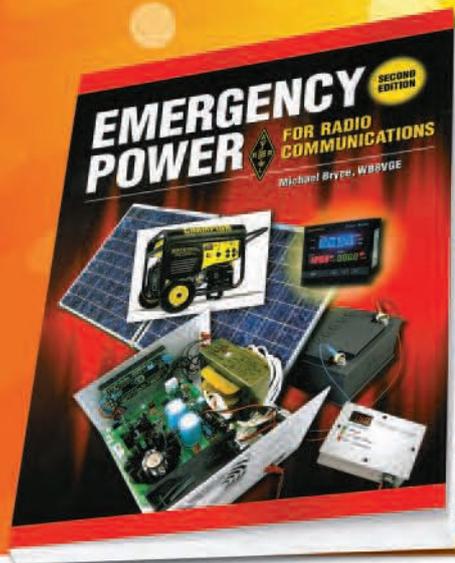


PHOTO 13: Completed PCB for the LED version.



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ATV

RF coaxial relay expectations

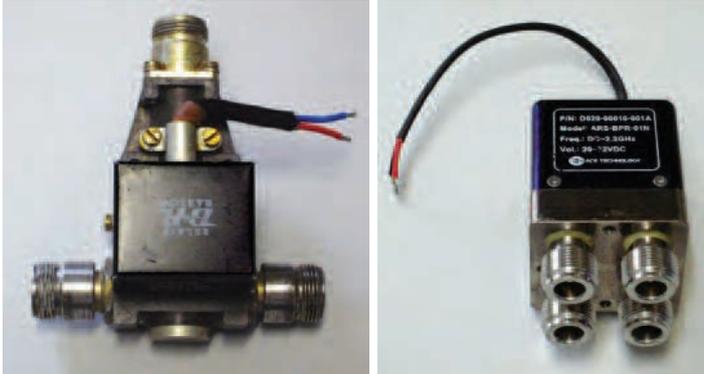


PHOTO 1: Typical coaxial relays. (Left) B&R Harlow, (right) Ace ARS-BPR-01N.

MICROWAVE COAXIAL RELAYS. In the last ATV column I said that having separate transmit and receive antennas eliminates the requirement for a relatively expensive coaxial changeover relay. Also, with careful separation of the antennas, 'look-through' can be achieved, ie the ability to simultaneously view your transmission coming back from a repeater. However, there are several occasions where an RF relay would be the way to go, for instance when only a single antenna is available. This is a good time to re-emphasise that sequential switching of Rx, antenna relay and Tx are essential to protect all system parts, particularly the receiver front end and the relay itself.

So, what performance is required for an RF relay? What may be acceptable at HF is unlikely to be so at UHF and microwave frequencies. The basic parameter for an antenna relay is obviously to at least switch the antenna between the receiver and transmitter. But, ideally this should not cause any signal loss or change the characteristic impedance between the antenna and receiver or transmitter. Another important parameter is signal isolation. That is to say, there should be no RF at the receiver input whilst transmitting. RF power handling must also be appropriate for the transmitter output. To go towards achieving these parameters the RF coaxial relay is designed with a format similar to coaxial cable and with the same characteristic impedance through the region of the change-over connections. In addition to just changing between receiver and transmitter, one form of RF relay, known as a 'transfer' relay, also switches the unused 'port' to an output that can be terminated with a dummy load. So, when in the transmit position, the receiver is provided with additional protection against any RF leakage from the transmitter. In some cases it is possible to have a switching arrangement where the dummy load is

independently selected, rather than the antenna, to enable transmitter tests to be carried out 'off air'. There is one other form of coaxial relay used for microwave that requires a pulse of DC voltage to switch from receive to transmit and then requires another pulse to

change back. A great advantage of this type of coaxial relay is that it does not require constant DC during transmit or receive and this greatly reduces any heating of the relay coil. Unfortunately, whilst often being the best type for the higher frequency bands such as 3cm (10GHz), the power handling of these relays is usually limited to between 1 and 10W RMS.

PRACTICAL RELAYS. Taking the case of an average 23 or 13cm ATV system, RF power handling would need to be 20 – 50W RMS. As a rule of thumb, receivers tend to be saturated with an input signal of -10dBm (0.1mW) and have the potential of damage at levels above +10dBm (10mW). This means that the isolation figure for the relay should be at least 53 to 57dB (20W = 43dBm + (-) 10dBm, or 53dB, for a -10dBm signal at the receiver). Measurements of several readily available relays used for amateur radio and a couple of 'identical'

transfer relays (recently available on eBay at around £25) and an impulse switched coaxial relay by Agilent produced the results shown in **Table 1**. As you can see there only a limited number of types of relays that are really suitable for use above VHF.

RELAY VOLTAGE BOOSTER. Many readily available RF coaxial relays need 24V to operate correctly. In some cases, a surge voltage circuit can be used as many relays will hold in at 12V after being switched on. However, for reliability and maximum life it is better to operate within the manufacturer's specification. In the particular case of the Ace Technology relays, they appear to be ok at 15V but, to play safe, 20V is the way to go. Where only a 12V supply is available the circuit in **Figure 1** is a possible solution, using a Traco TEL 3-1212 DC/DC converter.

NEWS ITEMS. The Home Counties ATV Club Mk 2 GB3HV 23cm repeater at Woodcote (IO91LM) has had one or two teething problems, however, seven 23cm analogue signals have been received from stations within the receive antenna beam, mostly reported as P5. Output is currently via the GB3HV stream at www.batc.tv.

Difficulties have occurred with the Leicestershire ATV repeater GB3GV. Although it is still operational, usage is reported as low. Like so many other repeaters, significantly rising costs mean that continued operation is currently under review and so, for the time being and to help reduce running costs, it will only transmit periodic beacon identification when not in use. The current keeper is Nigel, M1NAS.

J-BEAM AERIALS. Further to my apology in last month's *RadCom* to the definitely not SK Bill Sykes, G2HCG, you may be interested in Bill's fascinating history of J-Beam Aerials, which is online at www.g4hfg.co.uk/g2hcg/index.htm.

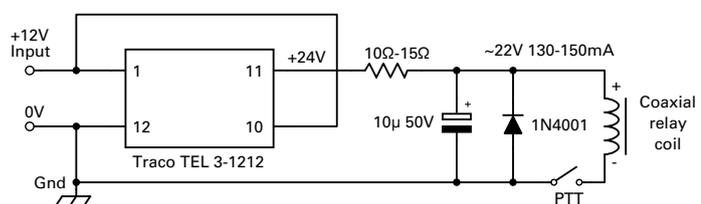


FIGURE 1: One way of operating a 24V relay from a 12V supply.

TABLE 1: Sample relay characteristics.

Relay type	Coil voltage	Insertion loss	Isolation
B & R Harlow (ex MOD)	12 or 24	0.5dB at 1.3GHz	12/25dB at 1.3GHz
Allied Controls 819W (ex PMR)	12	~0.5dB at 1.3GHz	38dB at 1.3GHz
Amphenol 318-010382-3	26	<0.5dB at 1.3GHz	46dB at 1.3GHz
Ace Technology ARS-BPR-01N	20-30	<0.25dB to 2.4GHz	>83dB to 2.4GHz
Agilent 8762 (rated 1W CW)	5, 12, 24	<0.25dB to 2GHz <0.5dB to 18GHz	>100dB to 4GHz >90dB to 18GHz



Brand New Model for 2012



Wouxun KG-UV6D
2/70 FM Transceiver.

The KG-UV6D1P was the UK's best selling Dual band Handie.

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

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

For more detailed information see www.WOUXUN.co.uk



New Product!

KG-UV6DL
4m + 2m Handie

To replace the KG-UV6D1P, this new version offers the same features as its 2/70 brother but on the very popular 70MHz & 144MHz bands.

Look at the frequencies in this display!!!

ML&S Price: £99.95

- ✓ KG-UV6D New Dual Band Handie
- ✓ Desk Top Charger (110-234v & 12V input) & Power Cord
- ✓ Cigar Car Charger
- ✓ Headset with PTT & Mic
- ✓ Eliminator
- ✓ Remote Mic/Speaker
- ✓ Leather Case
- ✓ 1300mA Li-Ion Battery
- ✓ 1700mA Heavy Duty Li-Ion Battery
- ✓ AA Empty Cell Case
- ✓ PC Programming Lead
- ✓ PC Drivers & Software



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

Also available for 70cm!

- KG 679E/2M **£59.99**
- KG-679E/U 70cm (400-470MHz) **£59.99**
- or with Voice Scrambler
- KG-689E/U **£69.99**



The KG-UV6D "Pro-Pack"

For a **Limited Time Offer** the factory has bundled together all your favourite accessories and placed them inside a presentation box.

In 2011, the Wouxun KG-UV6D1P was the best selling Handie in the UK. In 2012, ML&S introduce the new improved KG-UV6D. Better still, at only **£159.95 including ALL the accessories**, you save yourself a massive £50.00!

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



JVC KENWOOD Corporation is proud to announce a state-of-the-art Amateur transceiver scheduled for worldwide launch under the Kenwood brand in the winter of 2012. Featuring a dual TFT display and dual receiver, the TS-990S is a top-of-the-range flagship model in the Kenwood Amateur radio line-up. A prototype was displayed as a reference exhibit at Dayton Hamvention 2012, at HAM RADIO 2012 in Friedrichshafen, Germany (June 22-24), and at Ham Fair 2012 in Tokyo, Japan (August 25-26).

To keep up to date with info see our HamRadio.co.uk home page.

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Latest HF & 6M FULL DSP Base Transceiver from Kenwood



AVAILABLE FROM STOCK. £1269.95

The TS-590S is our best selling HF Transceiver of 2011. ML&S have sold more of these than any other dealer in Europe.

Deposit only £144.95 then 36 x £40.83 per month

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Add an MC-60A DESK MIC worth £119.95 for only £170!



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HF-70cm Auto ATU Base
£1469.95

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£239.95

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£429.95

TM-V71E 50W 2/70 Mobile
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200W HF+6m Mobile/Base
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2/70 Mobile/Base with APRS & TNC. **£445.95**

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£119.95

ML-5189
20W 4m Mobile
Only £148.95
Includes FREE DTMF Mic



New! HF-Auto 1.5kW Fully Automatic ATU for QRO.
In stock. **£1399.95**



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AT-1500DT	1500W Differential Antenna Tuner	£449.95
AT-2K	2000W Antenna Tuner	£479.95
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	£599.95
PM-2000AM	Power/SWR Meter.....	£159.95
Palstar Dummy Loads	DL-1500 (1.5KW) £119.95	DL-2K (2kW) £259.95
		DL-5K (5kW) £379.95

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HamRadioUK



New Yaesu FTdx3000 HF/6m Base



The new FTdx3000 HF + 50MHz 100 Watt Transceiver is another exciting new product that is certain to capture the hearts of determined DXers and Contesters as well as casual operators looking for solid communications. No release date yet - see web.



FT-950 Base Transceiver
Only £41.32 p/m!
£126.50 Deposit 36 x £41.32

A "proper size" HF/6m Base Station offering 100W output on all bands.

Add the MyDEL MP-925 power supply for only £1339.95 combined.



FT-dx5000 HF Base Transceiver
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All models in stock NOW. Best prices GUARANTEED. Call if you find one cheaper.

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FT-857D Only £23.72 p/m!
£73 deposit 36 x £23.73

Yaesu FT-857D & ATAS-120A Package
160m-70cm HF Base/Mobile.
Still our best selling HF Mobile Radio.

FT-857D + ATAS-120A: £999.95



New Yaesu FT-450D
Only £27.62 p/m! £85 deposit 36 x £27.62

Following on the success for the FT-450 original, the FT-450D has many improvements and comes fitted with the Auto ATU as standard.



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

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



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



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



Yaesu VX-8GE
2/70cm version of the VX-8DE. Fitted GPS, dedicated to APRS on 2/70.

Only £349.95!

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



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



Yaesu FT-270E
2M 5W Handie
£109.95



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



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



Yaesu FT-60E
Twin band handie
£179.95



Yaesu VX-6E
2/70 handie
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Yaesu FT-817ND
All Band All Mode Portable Transceiver
Only £17.87p/m!
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NOW BACK IN STOCK!



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



SPECIAL PRICE £359.95 on current stock only

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



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£239.95



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



Yaesu VR-160
Miniature communications receiver
£199.95



Yaesu FTM-350E

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



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



Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W)
Only £26.00p/m!
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or with AT-897Plus Auto ATU £924.95

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

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



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

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

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

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G-650C Medium duty with higher brake torque than the G-450.....	£379.95		
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Finance example: FT-950 at £1265.

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Or Plus 4 Pack only £3875*

- Options:
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 *Plus 4 Pack includes all of the above.

Icom IC-7800mk11 HF/6m Flagship Icom Transceiver

After waiting almost six months for our IC-7800mk11 to arrive, it's finally here. The IC-7800mk11 is used in the very best Ham shacks around the world and the quality of engineering found in this masterpiece will probably never be repeated by any other manufacturer.



200 Watts, Built in PSU & Auto ATU, Solid die-cast alloy front panel. They really don't make them like this anymore.

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- IC-E90.....£239.95
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- IC-910H.....£1296.96
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Icom IC-7410 100W HF+50MHz base station transceiver



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

RRP £1999 ML&S Only £1599.00 or £160 deposit & 36 payments of only £52.27p/m

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



Icom IC-7600

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

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

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ML&S Cancelled commercial order - Limited Stock!

Icom AH-710 1.8 - 30MHz All Band NO GAPS HF Antenna

RRP £408 inc VAT NOW ONLY £189.99 inc VAT.

So good even Mr. Lynch uses one himself. (although he wishes he'd waited to buy one at this special offer!) Limited stock so ONE PER CUSTOMER.

This Icom antenna is built to a very high commercial standard and is complete ready to go out of the box. It even comes with 30m of coax ready to plug into your transceiver and you don't even need an antenna tuner.

As reviewed in August RadCom

Intended for military use, the Icom AH-710 (also known as the Yaesu YA-30) is so simple to use. Just open the box, roll out the antenna (which is fully assembled) outside where you want to erect. Connect the supplied high quality coax cable assembly (terminated with PL-259's so you don't even have to fit any plugs), to the centre socket. Haul between two points, (with the supplied 10m of nylon rope) up to a tree (and or post/end of wall), plug into your rig and use. For best DX try and get the AH-710 at least 15ft off the ground, it doesn't matter if it slopes and higher the better.

It really is that easy. No tuning, no cutting, no trimming no wondering outside with your antenna analyser. It will 100% operate anywhere from 1.8-30MHz and better still, you do not need to use an ATU, manual or otherwise. Still want to use that G5RV? This antenna is commercial grade and built to last for years.

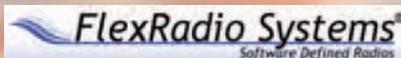
Only 30 pieces remaining!



The AH-710 comes with 98 feet (30 m) of 5D2V coaxial lead in. This lead has a PL-259 at each end. One end plugs into the SO-239 center-feed of the antenna and the other end to your radio. Icom also includes 32.8 feet (10m) of white nylon support rope. One foot (30 cm) of auto bonding waterproof tape is also supplied. Ready to go out of the box!

HF Linear Amplifiers

- RF concepts Alpha 8410 1.5kW HF Linear..... £4495.95
- RF Concepts Alpha 9500 Auto-tune HF Linear 1.5kW..... £5995.95
- Yaesu VL-1000 Quadra..... £4499.95
- Icom IC-PW1Euro..... £4699.95
- Ameritron ALH-811HXCE..... £969.95
- Lin-Amp Pioneer 1KW Amp..... £1639.95
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See page 6 of our advert for full FlexRadio Systems information

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Software Defined Receiver

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£489.95

Perseus VLF-LF-HF Receiver

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WINRADIO WR-G31DDC EXCALIBUR

£699.95

For full details see web.



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MFJ-16010	Random Wire ATU 160-10M.....	£69.95
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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
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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

The SBS-3 is in stock NOW!

Now with full ACARS capability - Built-in!

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



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

Only **£499.95** FREE WORLDWIDE SHIPPING see web

AirNav RadarBox & RadarBox-3D

RadarBox-3D Version.

ML&S: **£489.95**



RadarBox-Pro Version.

ML&S: **£289.95** (Saving £110 off RRP)

MyDEL MyDEL CG-3000

Price : £229.95

Tunable frequency: 1.8 - 30 MHz with long wire antenna from 8 meters
 Input impedance: 50 Ohms
 Input power: 10 - 200W PEP
 SWR: <2:1
 Power supply voltage: 12V +/- 10%
 Current consumption: <0.8A
 Auto tuning time: Approx. 2 seconds (first time tuning)
 Less than 1 second (return to memory frequency)
 Memory channels: 200
 Weight: 1.8 KG
 Size: 310mm X 240mm X 72mm (L - W - H)



MyDEL CG-3000/5000 - Remote Control Unit

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



The 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.

Two-year warranty on all MyDEL PSUs

NEW MyDEL MP-50SW111

50Amp DC power supply. **£149.94**

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



MyDEL PS-30SW11

High performance switch mode PSU. 25amp. **£86.75**

Very light and compact switch mode fully metered PSU with Noise Off-Set control in case of possible unwanted spurs. Input voltage: 240VAC. Output voltage: 13.8VDC. Adjusts voltage between 9.0 and 15.0 volts. When it is set at the center position it will supply 13.8 volts output Voltage regulation: less than 2% Protection: Short-circuit, Automatic current limiting With in 30A



MyDEL MP-925

Linear PSU **£99.95**



MyDEL MP-6A

13.8V DC, 6A power supply. **£29.95**



Ideal for FT-817ND or most handhelds.

MyDEL MP-9626

120A, 13.8V DC power supply, switch mode. **£399.95**



Yaesu FP-1030A

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



RF Concepts new product!

Alpha 4510 & 4520 Power Meters



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

For more information see our website.

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Kent Hand Key **£71.74**

From **£53.99**



Tigertronics SL-USB

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



From only **£99.95**

Call to discuss your rig-to-cable requirements.

MiniVNA pro

Pro-Antenna Analyser with Blu-Tooth. **£379.95**
SPECIAL OFFER
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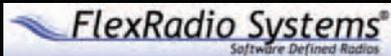
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The word is finally out, FLEX add the ULTIMATE SDR to their product range - The FLEX-6000 Signature Series



FlexRadio Systems is changing the face of Ham Radio. It is not often that a team of smart people are allowed to start with a clean sheet of paper and dream. Imagine if we could take everything we have learned in amateur, commercial and government markets and build a new class of transceiver, virtually without limits. Imagine if digital radio capabilities previously affordable only for commercial and government applications were now cost effective for Ham transceivers. Imagine a radio that will be a platform for dream applications both today and in the future.

With the FLEX-6000 Signature Series radios, FlexRadio brings a wealth of new capabilities to the amateur including direct digital reception, transmission and networking. At the core of all these new capabilities is SmartSDR. SmartSDR organizes all of the signal processing power in the FLEX-6000 Signature Series radios into an advanced reusable framework. First, the RF subsystems in the FLEX-6000 are virtualized as reusable hardware blocks or Signal Capture Units (SCU) with specific capabilities. SmartSDR understands the capabilities of each SCU and how to harness its power.

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

"I'm stunned at how 'good' the FLEX-5000 receives! I've had, and still own, some pretty good radios, FT-1000MP Mk-V, TS-950SDX, and a loaded K2, and this rig is just so different, I really can't compare it to a "regular" radio. The noise reduction is just staggering. I live over a two-story commercial building, and I've always been plagued by power line noise. Now, with one mouse click, it's GONE!" Jim, KQ6EA

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- Flex 5000A Flagship 100W SDR Base 160-6m£2495.95
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- Flex 5000A-ATU+ Twin RX as above but with second receiver£3434.95



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The Radio Communications Foundation (RCF)

WHAT IS THE RCF? I sometimes get a bit agitated when I see adverts telling me about 'your' bank or 'your' favourite store when I probably have nothing to do with them. But the RCF is well and truly 'yours', in the sense that it was conceived by the RSGB and is largely funded through the ongoing generosity of its members. It was established in 2002 and formally incorporated as a Registered Charity in 2003. In 2007 an agreement was signed between the Foundation and Ofcom for the administration of the amateur radio examinations.

Overall, the aim of the Foundation is to support people and projects where radio communications, through the expertise of the radio amateur, is the theme. Put quite simply, the vision that we have in the Foundation is to bring the benefits of radio to young people and encourage the use of technology. *The interested young person of today is the radio amateur of tomorrow and the engineer of the future.* This is the turn of phrase that aptly sums up what the Foundation is all about.

WHERE DOES THE MONEY COME FROM?

To the end of 2011, the Foundation has raised over £234k. Many Society members already make donations, some with their membership renewals, and donations can be increased when Gift Aid is applied to them. Money also comes in via bequests and the Foundation rigorously respects any instructions made in a legacy. Additionally, the Foundation has also taken a proactive approach towards fundraising with industry and public sector sources of grant aided money. We have approached the National Lottery in the past and would do so again if it was appropriate to look in that direction for funding to support our work.

WHERE DOES THE MONEY GO? Up to the end of our last Annual Report period, the Foundation has given out a total of £158k in grants in support of education and training in radio. The RSGB's mobile radio classroom, GB4FUN, has been a major recipient of Foundation funding in the past. This is a project that ticks all the boxes in terms of demonstrating the wonders of radio and technology to young people. There has been some fantastic feedback over the years – "really opened the minds of young people"; "weather satellites, talking to a chap in Italy, seeing footage of an International Space Station contact and so much more"; "made a great impact on the children"; we can see how

it complements our curriculum". These are just a few of the positive comments received. GB4FUN is currently off the road but when its future is clear the Foundation stands ready to consider support once more.

The Foundation provides grants that assist individual clubs or educational institutions. Examples of such funding include the refurbishment of a mobile training vehicle for a local club; a projector to help with amateur radio training classes in a local area; a contribution towards a portable mast and related equipment for a school of science and technology and help with a project to stream closed amateur radio television broadcasts over the internet. Obviously, we could not guarantee to support every request made but consideration would be given to any reasonable bid. The Foundation formally meets twice a year but projects can be considered electronically by the Trustees if there is an urgency.

Bursaries and scholarships are another area of Foundation activity that hits the spot of encouraging young people and boosting technology. The Foundation would consider supporting young licensed amateurs with a bursary to help them through university or college if the courses involve radio communications. In conjunction with the Arkwright Trust, the Foundation has also given support in the past with two annual scholarships for students who are actively considering higher education in engineering, product or industrial design and who make a commitment to design and technology at A level or maths at A/S level or who are able to demonstrate enthusiasm and aptitude in practical engineering or technology. The Foundation keeps in touch with the progress of former beneficiaries of funding. Arkwright students have gone on to university to study physics, mechanical engineering, maths and electrical engineering.

Sometimes departed amateur radio enthusiasts want to ensure that their 'silent key' is remembered and what better way is there to do this than to leave a legacy to the Foundation with instructions as to how the bequest is to be spent? Of course, the RSGB itself has recently been the grateful recipient of a very generous legacy. For those who want to see the Society flourish after their death then that is the answer. For those who want to see their name preserved as a legacy for the future to benefit youngsters and the use of technology in the hobby then a bequest to the Foundation is the right route. To take an example, the

Foundation is currently managing a bequest where the legacy stipulates that the funding must be used for the development of a suitable amateur satellite project. The outcome is FUNcube – a cubesat educational project that has the aim of enthusing and educating young people about radio, space, physics, science, technology, electronics, engineering and mathematics. Exciting times! FUNcube is due to be launched later this year and the Foundation's handling of the legacy entrusted to it is an essential part of this project. Hopefully in the future many will look up and give thanks to the satellite for enhancing even further their enjoyment of a fine hobby. Others will look up with fond memories of someone who cared so much for the future of the hobby that he wanted his pleasure to live on for the benefit of others.

HOW IS THE RCF RUN? The RCF is run by a very small Board of volunteer Trustees under the Chairmanship of Professor Sir Martin Sweeting. The other Trustees are David Hendon, Anthony Vinters, myself and Marilyn Slade from the RSGB, who is currently Treasurer and Secretary.

HOW CAN YOU GET INVOLVED? If you are not already making a donation through your membership renewal, then *do please make a commitment in this way.* Every little helps. Also, individual one off donations are always welcome. Perhaps you could check to see if your employer has a payroll giving scheme for charities if you want to make a regular donation via that route. Another good idea would be to get your local club to actively consider a fund raising event for the Foundation. Please consider making a bequest in your Will to ensure that your interest in amateur radio lives on and benefits others. The future of the hobby is the youngsters that we encourage into it and the technology that is developed. Be a part of that future. Support the Foundation!

Barry Maxwell was Director of the Radio Investigation Service for 17 years, taking the organisation into Ofcom from where he retired in 2005. Previously he had been Head of Radio Licensing and in his time there the 50MHz band was allocated to amateur radio, the conduct of the Morse Test transferred to the RSGB and the Young Amateur of the Year Award was instituted.



Gifts – You Can Make a Difference

Your gift can help the Radio Society of Great Britain (RSGB) and the Radio Communications Foundation (RCF) to promote and maintain amateur radio for the next generation of radio amateurs to enjoy. You will also be assisting the Society in the fight to protect the radio spectrum against harmful interference and in helping both organisations in their work in encouraging young people to take up a career in engineering and science. Legacies are vital to the RSGB and the RCF. All the monies received will make sure that both the RSGB and the RCF will be able to continue to support amateur radio development for years to come.

HOW DO I MAKE A GIFT? There are a number of ways you can leave a gift to the RSGB or the RCF. First of all, consider who you would like to benefit. If you would like the Society to benefit and use the legacy to further its objectives then you should make your bequest to the RSGB. If, however, you would like to leave a more general gift to amateur radio then you should consider making your bequest to the RCF. There are several different types of gift:

Residuary. A residuary legacy is a gift of the residue of your estate, or a percentage of the residue (the amount left after your debts have been settled and any legacies you leave to other people have been paid). If you leave your whole estate as a gift, this is known as a residuary legacy. The value of such a gift is least likely to be cut by inflation.

Pecuniary. This is a gift of a specified sum of money, decided when the will or codicil is written, and is called a pecuniary legacy.

Specific. This is when you make a gift of a specific legacy. This includes stocks and shares, the proceeds of a life assurance policy, property and the proceeds of the sale of your radio equipment. Please note we cannot accept radio equipment, books, magazines or QSL cards unless they are of high historic value.

HOW DO I DO THIS? First you have to make a will. Many people never make a will because they assume everything will go to their spouse or children – this isn't always the case. For example, if your children are under 18 you need to think about who will bring them up should you and your partner die together. It's essential you make plans for the money you leave when you die, however large or small the amount may be. To make

sure your money goes to the people you choose, you – and your partner if you have one – should both make a will.

HOW MUCH DOES MAKING A WILL COST? Making a will is quite straightforward. A solicitor can help you draw one up – you can find solicitor's names in a telephone directory or on the internet. The fee for drawing up a will is normally quite small – ask the cost before you proceed because lots of solicitors run low cost schemes.

WHY CONSULT A SOLICITOR? Above all you are going to want your wishes carried out exactly as you intended. You will want your will watertight and free from legal snags. That is why we always recommend using a solicitor. It is much safer to pay an expert to do the job, as a home-made will may be unclear and invalid.

HOW CAN I REDUCE INHERITANCE TAX? Any money you leave to your spouse or to charity is not subject to inheritance tax. So by leaving a gift to the RSGB or RCF, you will not only be enabling us to carry on our work of promoting and protecting amateur radio – you could also substantially

reduce the amount of tax payable on your estate. Inheritance tax is deducted from your estate when your will is proved. The amount is dependant on the value of your estate and the government sets the current limit. Your solicitor will be able to advise you.

CAN I CHANGE MY WILL? If you already have a will, it's easy to amend it. Minor changes – such as adding a gift to the RSGB or RCF – do not require a new will. The existing will can be amended by preparing a document called a codicil, which your solicitor will help you draw up.

CAN I REALLY MAKE A DIFFERENCE? Yes you can! We are sure you have enjoyed many years as a radio amateur and made many friends along the way. The RSGB and the RCF are determined that future generations will enjoy the hobby just as you have done. Your gift will help us do this.

If you require any further information on Gifting to the RSGB or the RCF please contact the Secretary, Radio Communications Foundation, c/o Radio Society of Great Britain, 3 Abbey Court, Frasers Road, Priory Business Park, Bedford MK44 3WH or e-mail GM.Dept@rsgb.org.uk.

The Radio Communications Foundation Board Trustees

- Two meetings a year, based in London
- Non-remunerated roles (reasonable expenses payable)
- Commitment to equal opportunities and diversity

The Radio Communications Foundation is a Registered Charity whose aim is to bring the benefits of radio to young people and encourage the use of radio technology.

WE ARE CURRENTLY LOOKING FOR NEW TRUSTEES TO JOIN OUR SMALL BOARD. Applicants will have a deep interest and passion for amateur radio and its technology, time to give a real commitment to the Charity's work and an ability to provide good governance for the Board's deliberations. To complement the skills of existing Trustees, we are particularly looking this time for people who have an interest in further education or who can bring relevant business and fund raising experience to the Board. For more information on the Charity's work go to www.commsfoundation.org.

Applications to: Secretary, Radio Communications Foundation, c/o Radio Society of Great Britain, 3 Abbey Court, Priory Business Park, Bedford MK44 3WH. The closing date for expressions of interest is 31 July 2012.

HF

The latest news on upcoming DXpeditions and what's been heard on the bands



John, EA5ARC took this shot recently, while hoping his antennas would survive!

706T REDUX. 706T (Yemen), which had just started when I submitted last month's column, certainly turned out to be the big event of May. The team put on a fantastic effort, resulting in some 162,000 contacts. UK stations found the going tough in the early days, with southern and eastern Europe enjoying better propagation, but eventually it became much easier and many UK stations made contacts on multiple bands, 10 through to 160m. As it's so long since Yemen has been activated, the demand was unremitting, even with six stations on the air from 706T round the clock. With just ten operators on the island (Socotra) at any given time, manning six stations meant there was very little time for anything other than operating, eating and sleeping. All credit to them for pulling off this magnificent feat. The low band operators had a particularly tough time; to avoid noise problems at the hotel they relocated the 160/80m station to a more remote location with only the most basic facilities. A series of post-expedition postings on the Top Band reflector by Jeff, K1ZM, who was one of the low band operators,

really brings this home. Another issue was that, having spent the best part of two years getting all the permissions in place (and not publicising anything, in case it didn't happen) the final approval came somewhat unexpectedly while UA9USU (team leader) was on yet another negotiating trip to Yemen. The decision then had to be made as to whether he and one or two others would do a 'quick and dirty' effort or whether they should try and enlist a bunch of other operators, at very short notice, to come to a part of the world known more for terrorism than tourism. Amazingly, they managed to pull together such a team, but the short notice meant there was no time for fund-raising, so various team members have subsidised the trip hoping that DXers, in appreciation, will be generous after the event.

Incidentally, there is a great report on the trip on the DX Coffee website.

THE BANDS IN MAY. There is a view that, as summer approaches, the HF bands get less interesting. But the flip side is that, because of the higher ionisation, the high bands can stay open well into the night. Thus it was during the WPX CW contest at the end of the month, when 15m was still open to the USA as late as 3am and 20m stayed open throughout the night. Even 10m played quite well, with (albeit weak) signals from the Far East early in the day and the US and Caribbean later, along with very loud European signals via Sporadic-E for much of the day and well into the night. At the lower end of the spectrum, I found myself working the US West Coast on 40 during the contest at least two or three hours after dawn.

In terms of what was active in May, in addition to 706T, XROZA from Juan Fernandez (Robinson Crusoe Island) was a nice surprise. A team from Chile were there to set up radio to communicate back

with the mainland. As a result, the amateur radio operation was quite limited but managed to please a lucky few. Another welcome surprise was a fairly extensive effort on 17 CW one weekend by Monk Apollo, SV2ASP/A. There were several other handy expeditions, too, not least of which was A5A from Bhutan, worked in the UK on several bands. From our own end, it was fun for many of us to be the chased rather than the chasers, using the GQ prefix, and we can repeat the process in the near future but with GO. That said, not many UK special event stations are likely to emulate the 16,600 QSOs in less than 6 days made by GR100MGY (the back of my head even featured on BBC South while operating that one!), although I feel sure the Olympic station operators in Greenwich will do their best to put up some big totals.

DX NEWS. CY9, St Paul Island, 'The Graveyard of the Gulf', is the destination for an expedition from 26 July to 1 August. This is a ten-man team including Col, MMONDX of dx-world.net. This will be all bands and modes. Apparently CY9 was last activated as long ago as 2005, so is now much sought after. QSL via MOURX.

I was sorry to hear that Jacky, ZL3CW who was in New Caledonia recently as FK/F2CW (and TX8CW in the WPX CW contest) suffered a stroke shortly after the end of the contest and was hospitalised in Noumea, just shy of his 58th birthday. We wish him well for a speedy recovery. He is one of the operators scheduled to be on the ZL9HR Campbell Island operation later in the year.

Mike, UA1QV, is working in Angola as an engineer at the Catoca diamond mine and is expected to be there for the next two to three

COUNTRIES WORKED, 2012 (starting 1/1/12, first totals, listed by Mixed total)

Call	CW	SSB	Data	All
G3HQT	172	0	1	172
MUOFAL	130	56	0	147
GORPM	49	71	109	145
MOBVE	131	0	0	131
MOVKY	118	0	0	118
G4DDL	86	45	43	101
G4XEX	0	66	81	100
G6CSY	27	3	31	40
G4FVK	30	0	0	30

years. He is close to D2QV and D2QMN. Mike applied for his licence on 12 January and is now D3AA. He is running 100 watts from an Icom IC-756 Pro II using a two element quad on 20, 17, 15 and 10, an AP8A Cushcraft ground plane on 80 through 10 and an 80m inverted vee. In July he will go back home to Russia and then bring back an amplifier and vertical for Top Band. Even with his 100 watts, I have already worked him on 4 bands, which is a good sign. QSL D3AA via UA1QV.

Freddy, F5IRO/J28IRO, is in Uganda and active as 5X1RO (though initially he was signing 5X5RO). He has been active almost every day recently.

Al, CY0/VE1AWW on Sable Island recently reported that her had to go QRT due to "a migratory bird (and protected species)" being found dead near his towers. He said "I am required to take down the towers until an investigation and policy can be developed for tern season (April-August)". The towers are laid down, but ready to go back up if I get the okay" he says. I have seen similar concerns aired before, although my own experience is that birds tend to treat antennas just like trees and land on them, often with 'interesting' results if it is at the thin end of the elements.

Gordon, G3USR and Graham, MOAEP are due to sign VP2MSR and VP2MDD from Montserrat between 6 June and 12 July. QSL to their home calls. Graham is due to arrive on the island 6 June and leave 7 July while Gordon arrives 29 June for two weeks. Graham says he plans to concentrate on 12 and 10 SSB and CW only, no digital. And he'll be in the IOTA Contest. But he will also be spending much of his time retiling the swimming pool!

Eric, KV1J, will be returning to Miquelon operating as FP/KV1J from 10 to 17 July. He plans to be on all bands, SSB, CW, RTTY, PSK-31 and Feld Hell. The Motel de Miquelon (Maxotel), home to many FP operations, has closed indefinitely so Eric will be operating from a private home that may become a location for future DXpeditions. Eric has a web page. QSL via KV1J and LoTW.

DX HALL OF FAME. CQ magazine once again used the Dayton Hamvention as the opportunity to announce the latest inductees into its DX Hall of Fame. This year the accolade went to Carl Smith, N4AA, Glenn Johnson, W0GJ, and Donald Chesser, W4KVX (silent key). Carl is probably most known by the DX community as the publisher and owner of *QRZ DX*, *The DX Magazine* and CQ magazine's DX Editor. Glenn, has been a leader and participant in many DXpeditions (including T00R, VKOIR, FT5XM, A52A/A52GJ/A51B, VU4AN/VU3RYJ, VU7RG, K5 Descheo and HKONA), giving many a new country and new band points. He has also given back to the hobby as a member

of the Northern California DX Foundation (NCDXF) including his recent choice as Vice President. Don passed away in 1985 and by all means should have been inducted years ago. He organised DXpeditions to VP5BH (Caymans), KC4AF (Navassa) and KS4BB (Serrana Bank) and was part of the all-time new one 4U1TU. He was also the editor and publisher of *DX Magazine*, which was started on 4 June 1957 as a post card and quickly grew to 'the standard for all DX bulletins'. Also during this period Don served as the DX editor for *CQ* magazine.

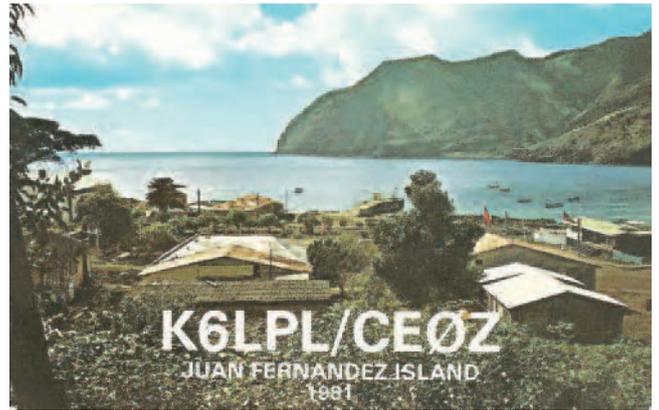
DX-INFO. DX-Info is a web-based application that helps chasing for missing band and mode slots for DXCC. After registration and uploading a log file in ADIF (amateur data interchange format, produced by most logging programs) you will get a personal calendar with DX information for the current week. More detailed information can be found on the website.

CORRESPONDENCE. Colin, MUOFAL is back on the bands and spending a lot of time on 17m where he caught HP1/IQ6CC, HC2/KF6ZWD, HC2SL, HC1HW, OA1F and A92GE on CW plus 9K2OD and JX9JKA on SSB. He also managed to bag 706T for 8 bands slots from 20m upwards.

Mike, G3SED writes to say that he feels the 9-band all-time table has rather had its day, with the top positions staying rather static. He does feel, in contrast, that the annual table generates friendly competition and activity and is well worth preserving. Mike caught 706T on 160 for his country 280 on that band. Well done.

Tom, ZS1AFS reports that the ZT1T special event activity netted 139 countries in April. Surprisingly, he says, 78 were on 12m. He says, "Part of the ZT1T licence conditions is that visiting hams can operate providing they bring a copy of their licence. So if any operator would like to come out to South Africa, they can get in touch".

Nigel, GORPM sends in a report after a spell when he was otherwise engaged. His year started well with a number of new ones and he comments that he particularly enjoys the way many of the recent expeditions make a point of updating regularly to an online log (often using Clublog for this purpose). Not only is it nice to see your contact is safely in the log, but also (in many cases) to see who the operator was at the far end. More recently, says Nigel, "I had almost given up hope of ever working Mount Athos and Vatican City but I happened to be in the



QSL card from the late K6LPL's expedition to Juan Fernandez, the same island that was recently activated as XROZA, see text.

right place at the right time and managed to get them in the log too". His best DX in the last 6 weeks is as follows: 15m RTTY: 9V1SV, YB1ALL, TO3X and VU2NKS; 17m SSB: JX9JKA and HV4NAC; 17m RTTY: 9M2CNC, SU9VB and VR2XLN; 20m RTTY: T88RF, E21YDP, T6JP, CP1FF, SU9VB, YB6EN, 4S7BRG and XU7NPC; 20m SSB: FO4BM and SV2ASP/A; 40m SSB: JX9JKA. At the time of writing he had also worked 706T on 5 slots (15, 17 and 20 SSB, 17 and 20 CW).

Peter, G3HQT reports contacts with 600CW and JT5NM on 30, XV2W, BD9GBV and OA1F on 20, YJOVK, YB1GJS and ZA1G on 17 plus 7Q7PRO and 706T on 15, all CW. Dave, M0BVE reports CT8/DL5AXX (Azores) on 30, RI1FJA (Franz Josef Land) and KH6MB on 20, 706T on 17, plus RI1ANF (South Shetland) on 15, all CW. Dave was particularly pleased with this last one as he visited the Russian base of Bellingshausen in 1981 on *HMS Endurance*.

SILENT KEYS. Larry, AH8LG passed away on 8 May at 80 years of age. The president of the American Samoa Amateur Radio Association (ASARA), Larry was an active DXer and over the years he helped quite a few DXpeditioners travelling to Pacific destinations. I feel sure many readers will remember him.

Dr David Gardner, K6LPL, is another who passed away recently. He went on several DXpeditions including K6LPL/KH5, Palmyra, in 1980, plus K6LPL/CEØZ and K6LPL/KH3. The Palmyra operation included a plane crash with WA6YOW being med-evacuated and Dave suffered a hand injury. Dave was a neurosurgeon by profession and a Vietnam War veteran. In addition to amateur radio, he enjoyed reading, growing orchids, astronomy, collecting coins and stamps and photography.

WEBSEARCH

CY9M: www.cy9m.com/
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VHF/UHF

Excellent Sporadic-E openings on the 50, 70 and 144MHz bands during May



PHOTO 1: The operating position at the QTH of Ian Goodier, GOUWK.

PROPAGATION EVENTS. I always find it amazing, if not entirely predictable, how the onset of the summer Sporadic-E (Es) season can create so much excitement on the VHF bands. Only a month or so ago there was, apart from regular meteor scatter, little in the way of propagation that would launch your VHF transmissions way beyond 1,500 kilometres on a daily basis. But then, on 29 April, the summer Es season commenced with a vengeance and daily (except on two occasions) 6m openings were reported right through to the end of May. Single-hop events encompassed all of Europe and beyond into northern Africa and the nearer reaches of the Middle East and other Asiatic countries. On a number of occasions some significant multi-hop openings on the 6m band were reported into the Caribbean area, the United States of America and Canada. Trans-Equatorial propagation (TEP) was also reported on many days during May with openings deep into Africa and South America. During the period a small number of coronal mass ejections (CME) were directed towards Earth and these gave rise to a few short lived 6m auroral-backscatter and auroral-Es events. Es openings were reported on the 4m band during 50% of the month and on 29 May one event even reached up as high as the 2m band. An excellent start to the Es season!

50MHz SPORADIC-E OPENINGS. Apart from the 19th and 23rd, openings were reported every day during May, with many DX stations being worked from all areas of the UK. A significant number of countries were contacted on CW and SSB and these included Andorra (C31VM), Austria (OE4VIE), Azores (CU1EZ), Bahrain (A92IO), Balearic Islands (EA6/MODLL), Belarus (EW2KC), Belgium (ON8DM), Bosnia-Herzegovina (E70T), Bulgaria (LZ2012KM), Canary Islands (EA8/G8BCG), Ceuta (EA9IE), Corsica (TK7JC), Crete (SV9GPV), Croatia (9A203SM), Cyprus (5B4AGN), Czech Republic (OK2OV), Denmark (OZ2SYV), Dodecanese (SV5BYR),

Estonia (ES5GP), Faroe Islands (OY1CT), Finland (OH5LK), France (F5GXX), Germany (DL6UAA), Gibraltar (ZQ2EO), Greece (SV3DVO), Hungary (HA6NL), Iceland (TF3ARI), Ireland (EI8OIRTS), Israel (4Z4DX), Italy (IK5GQK), Jordan (JY4NE), Latvia (YL2LW), Lithuania (LY2KX), Luxembourg (LX1JX), Montenegro (4O4A), Netherlands (PA2M), Malta (9H1SP), Moldova (ER1LW), Monaco (3A2MW), Morocco (CN8KD), Norway (LA3EQ), Poland (SP8AWL), Portugal (CT1FJC), Romania (YO6XK), San Marino (T77C), Sardinia (IS0BSR), Serbia (YU6DX), Sicily (IT9CJC), Slovakia (OM3EY), Slovenia (S55DX), Spain (EA7/G0WHX), Sweden (SMORCL), Switzerland (HB9CQL), Turkey (TA2AD), Ukraine (EM35OS) and the United Arab Emirates (A65BP).

Incidentally, not all contacts were made using CW or SSB and many QSOs were reported that used PSK31 around 50.250MHz with stations such as CN2YZ, ISOCDS and YU7AU. A few kilohertz higher, around 50.255MHz, RTTY activity could be heard with EA5HMQ, FM5AA, IK8INR and many other stations being contacted via this mode. ROS activity appears to be located on 50.245MHz with stations such as CT1PT, EA5GKO and F4ARB. There was even some SSTV activity on 50.510MHz with a number of stations exchanging RSV595 reports.

During the last week of the month, between 26-31 May, there were 6 days when multi-hop transatlantic propagation was reported, particularly to the Caribbean area of North America. Incidentally, there were considerably more contacts made into these rare DXCC locations than with stations located in the USA and Canada. The countries worked during the last week of May, made mostly during the evening period, included Aruba (P48ADI), Canada (VE1PZ), French Guiana (FY1FL), Guadeloupe (FG5GP), Martinique (FM5WD), Puerto Rico (KP4EIT), St Lucia (J69MV), Trinidad & Tobago (9Y4D) and the USA (W3LPL).

TRANS-EQUATORIAL PROPAGATION. A total of 16 TEP openings were reported on the 6m band throughout the month to stations located in southern Africa and South America. It is highly likely that these events were assisted by Es propagation that existed at the same time, making a dual mode Es + TEP path. Incidentally, mixed-mode propagation paths are not particularly unusual and may occur at any time throughout the year. The TEP openings during May were quite widespread, with stations

from central Scotland right down to the Channel Islands reporting contacts with African countries that included Djibouti (J28AA), Gambia (C5YK), Mauritius (3B8DB), Reunion Island (FR4NT), South Africa (ZS6WN), St Helena (ZD7VC), Sudan (ST2AR), Zambia (9J2BO) and Zimbabwe (Z21LV). Later in the evening, typically between 2000-2100UTC, openings were reported to South American countries that included Argentina (LU5FF), Brazil (PV8ADI), Chile (CE2/VE7SV), Fernando & Noronha Island (PYOFM), Suriname (PZ5RA), Uruguay (CX7CO) and Venezuela (YV5ESN). Additionally the beacon stations of OA4TT (Peru), ZD8VHF (Ascension Island), 6V7SIX (Senegal) and 9Q1D (Democratic Republic of the Congo) were also reported by many UK stations. All in all, an excellent month for 6m DX activity with well over 80 countries being worked from the UK.

Paul Marchant, MOWAF (Lincolnshire, IO92) running 50W from a Yaesu FT-847 transceiver and a 5-element Tonna Yagi was pleased to work, on 13 May, many SSB stations that included HA6NF (Hungary), I7IWN (Italy), IS0BSR/P (Sardinia), LZ2DF (Bulgaria), OK2GM (Czech Republic), S54W (Slovenia), YO8KOC (Romania), YU1JW (Serbia) and 9A4TA (Croatia). Similarly Ian Marsh, MOUAT (Kent, JO01) was pleased to contact EA1BP, EA1CCM, CT1DIZ and CT2GSN as he was only running a dipole on top of a 4m high fishing pole.

Jamie Ashford, GW7SMV (Gwent, IO81) reports that he managed to work many DX stations during May on the 6m band. Amongst his Es contacts were the stations of CT8/KORUI (HM68), EA8/G8BCG (IL39), ER1SS (KN46), TA2AD (KN51), 4X4DK (KM71) and 4Z4KX (KM71). A little further afield he found the stations of ST2AR (KK65) and A65BP (LL75) and via multi-hop across the Atlantic Ocean to FM5WD (FK94), KP4EIT (FK68), WP3UX (FK68) and 9Y4D (FK90). Jamie also made contacts via TEP into Africa with FR4NT (LG79) and 3B8DB (LG89) and into South America with LU8MB (FF57), LW3EX (GF05) and PY2HN (GG66). On 18 May he made a CW contact with the station of CE2/VE7SV (FF47) some 11,517km distant for his 193rd DXCC country.

THE 70MHz BAND. A total of 17 days of Es openings were reported on the 70MHz band during May. Activity is particularly high throughout Europe now that an increasing number of countries have either a permanent or temporary allocation. Many of these countries are located at an ideal distance away from the UK (greater than 1000km) and this enables Es contacts to be made with relative ease when conditions are right. Interestingly the 70MHz band is relatively unique insofar that there is little off-the-shelf equipment. So apart from using a transverter system or the Yaesu FT-847 that can be modified to work on 4m (details can be found on The Four Metres

website www.70mhz.org) many operators simply use ex-private mobile radio (PMR) equipment operating on FM. Ordinarily the use of FM is not thought of as a DX mode but it does work rather well during the Es season where received signals are often very loud.

During May a total of 28 countries were contacted by operators throughout the UK and these included all 7 UK regional DXCC countries, the Aland Islands (OH0/OZ2M), Balearic Islands (EA6CA), Belgium (ON4GG), Canary Islands (EA8TX), Croatia (9A6Z), Czech Republic (OK1DFC), Faroe Islands (OY9JD), Finland (OH1XT), Germany (DI2AI), Greece (SV8CS), Italy (IZ8DWF), Luxembourg (LX2LA), Netherlands (PA2M), Norway (LA4YGA), Poland (SP2JYR), Portugal (CT1DIZ), Romania (YO2LAM), Sardinia (ISOAWZ), Slovakia (OM5KM), Slovenia (S52GJ) and Spain (EA7HG).

Incidentally, all Polish radio amateurs now have access to the 4m band, 70.100-70.300MHz with a maximum power of 20W EIRP. This came into force on 1 June 2012 and the first contacts with Poland (SP) were made from the UK just after 2300UTC on 31 May. Hungarian (HA) radio amateurs are expected to be granted a permanent allocation, 70.000-70.500MHz very soon. There is a beacon, HG1BVC, already active on 70.060MHz, and this was spotted on a number of occasions during May. Other beacons heard during the month included 5B4CY (Cyprus, 70.113MHz) and SV5FOUR (Dodecanese, 70.016MHz).

There was a bit of excitement towards the end of the RSGB 4m cumulative contest on 27 May when the station of OM3CLS (Slovakia, JN99) made contest QSOs with G0EHV/P (IO94), GM4JR (IO85) and GM4IGS (IO75). In Finland, OH5LID (KP41) managed to work G4ZTR (JO01) at 1,988km and G4VPD (IO92) at 2,094km distant and the station of S51DI (Slovenia, JN76) contacted GM4VVX (IO78) at 1,866km.

Two days later, on 29 May, it was the turn of the 4m UK activity contesters to experience some Es activity. During the first 30 minutes of the contest the stations of CT1DIZ, CT1QP, EA6SX, EA7HG, EA7KB, EC7AMY and OY9JD reported making contacts with operators situated throughout the UK. The best DX of the contest appeared to have been the QSO made between G14SNA (IO64) and EA8YT (Canary Islands, IL18) at 3,016km distant.

Peter Tribe, G0VVE (Surrey, IO91) mentions that he has not done much operating on the 4m band and that the Es opening on 29 May was the first he had experienced on that band. On the previous day he had added a home built GOKSC design 9-element LFA Yagi onto his tower, having previously modified his Yaesu FT-847 transceiver to allow it to transmit and receive on the 4m band. When Peter switched the transceiver on at 1530UTC he was delighted to find 4m wide open to Italy. With their three 25kHz wide allocated band

segments it was very crowded but he did manage to work 12 Italian stations. Furthest distances were with the stations of IZ7JXJ (JN80) at 1,771km and IZ8DWF (JM78) at 1,932km distant. By 1700UTC the opening had moved south with the Portuguese beacon, CS5BFM (70.166MHz) peaking 589 for over an hour. He was fortunate to work another dozen Spanish and Portuguese stations, notably EA6CA (Majorca, JM19) and EA8YT (Tenerife, IL18) over a 2,868km path. Typically, the Es propagation faded out shortly after the start of the 4m activity contest at 1900UTC although G0VVE did manage to make another 4 contacts with CT and EA stations and surprisingly with OY9JD (Faroe Islands, IP62) for another new country. All in all, an eventful day on the radio and well worth the effort of building a large antenna.

Mike Pugh, G4VPD (West Midlands, IO92) mentions that he was pleased to catch a 4m opening on 29 May and that between 1525-1600UTC he contacted the SSB stations of IKOFTA (JN61), IKOSMG (JN61), IWOBET (JN61), IWOHLE/5 (JN52), IK1EGC (JN35), IK5YJY (JN53), IK5ZWU (JN53), IZ5EME (JN52) and IZ5ILX (JN54).

Graham Kimbell, G3TCT (Somerset, IO81) reports that he contacted OM3CLS and OM3PV on 2 May, IWOBET, IZ5EME and I5TWK/8 on 15 May, CT1DIZ and EA7KB on 26 May and the stations of I7CSB, IZ7FLS and SV8CS on 28 May. Graham mentions there was a major opening to Italy on 29 May with all stations crammed into a 25kHz allocation! He worked IZ5ILX, IZ5HQB, IZ8DWF, IKOSMG, IZ7JXJ, IWOHLE/5, IK5YJY and EA4LU and then with the opening continuing into the UKAC contest, the stations of CT1QP, EC5BQQ, EC7AMY, EA7KB and OY9JD.

144MHz SPORADIC-E OPENING. An excellent 2m opening, the first of the summer season, occurred on 29 May between 1600-1815UTC with stations in southern and central England, the Channel Islands and Wales making SSB contacts around 144.300MHz, the SSB calling frequency. Two paths were available, one to the Mediterranean area, Italy, Sardinia, Sicily and Malta and the other due south to Portugal, Spain and the Balearic Islands (**Figure 1**). Some of the DX stations known to have been worked included CT1ANO, CT1DIZ, CT1DMK, CT4RK, EA1FBU, EA1YV, EA4EHI, EA6RF, IOYLI, IKOFTA, IZ7QVD, IC8TEM, ISOBDB, ISONIR and IW9ABZ. The low-power beacons of SV8GKE (Greece) and TK5ZMK (Corsica) were also heard during the opening.

Darrell Moody, G0HVQ (Gloucestershire,

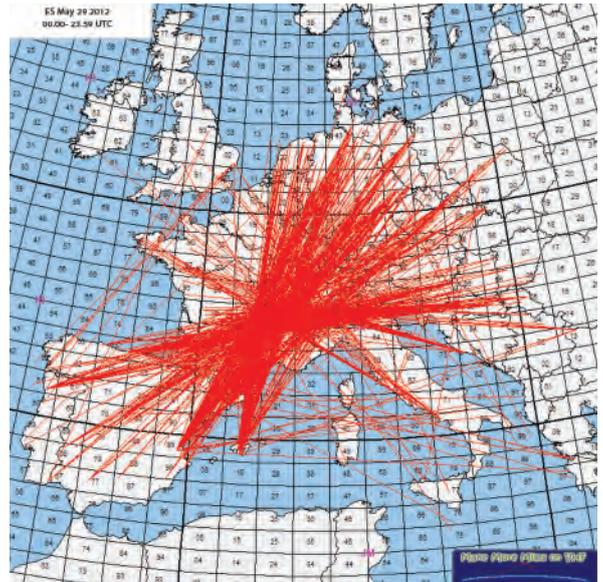


FIGURE 1: The 144MHz Es opening on 29 May. Courtesy of Make More Miles on VHF (www.mmmmonvhf.de).

IO81) mentions that he caught his first Es of the 2012 season when he worked the station of ISOBOZ (JM49) at 1666km distant. He also heard CT1HZE and ISOSWW but Darrell reports that he was right on the edge of the opening and that signals only popped up out of the noise for a few seconds every few minutes.

Ian Goodier, GOUWK (Staffordshire, IO83) mentions that he uses a Yaesu FT-2000 transceiver, driving a 28MHz to 144MHz transverter, a GS31b triode amplifier and a 10-element Yagi (**Photo 1**). His SSB contacts, made between 1615-1630UTC, were with the Italian stations IOYLI, IKOSMG, IKOWGF and IWOFFK.

The opening at the QTH of GW7SMV was observed between 1609-1637UTC during which time he contacted I5TWK/8 (JN70), IZ5BRW (JN53), IZ8EDJ (JN70) and IW9HII (JM67) at 1,950km. Unfortunately he couldn't complete a QSO with the station of 9H5ET (Malta, JM75) as that station faded out during the contact.

Gordon Smith, GW6TEO, (Pembrokeshire, IO71) commented that it has been a long time since he has been in the right place at the right time to catch the Es opening. Running 350W into a 9-element Yagi he contacted the stations of IKOBZY, IKOSMG, IWOFFK, IKOWGF, I5TWK/8, ISOBHZ, ISOBOZ, ISOSWW, IT9RDG (JM68) at 2,042km, IW9HII (JM67) 2,057km, IT9TJH (JM67) 2,165km and I8YZO (JM78) for best DX at 2,175km distant.

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

GHz Bands

Squeezing the circle on 6cm

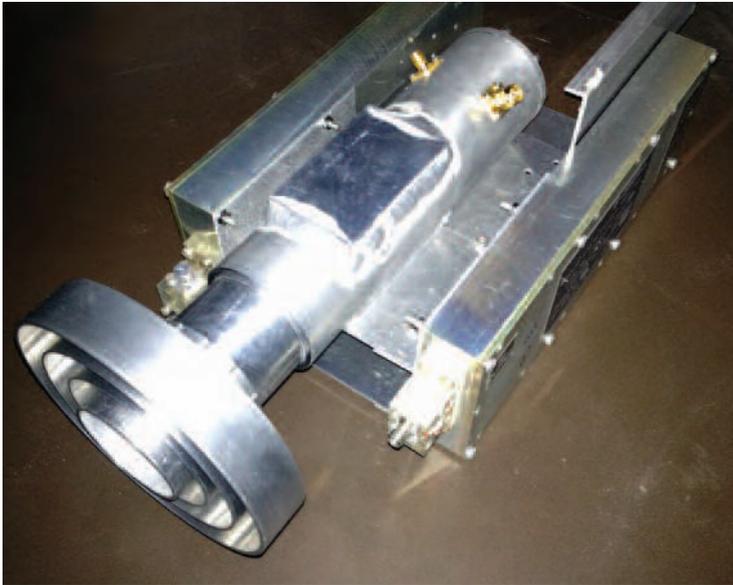


PHOTO 1: Squeezed waveguide horn feed mounted on a carriage designed to fit the existing feed cage on my 2.3m diameter dish. The two side 'blocks' are 6cm solid state power amplifiers.

BAND ACTIVITY. The first few months of the spring have been unusually wet, with average temperatures in the southern part of the UK several degrees below normal. These weather conditions seem to have depressed conditions on the microwave bands, as the May contest report that follows, will show.

MAY 432MHz – 248GHz CONTESTS. This contest weekend (5-6 May) incorporated the RSGB 10GHz and 432MHz Trophies as well as the IARU 432 – 241GHz contest.

Conditions during the contest were well below average, with many stations struggling to make contacts that ordinarily would have been routine. A good example was that PA6NL (JO22) located at the Hook of Holland and just 150km from my home location was totally inaudible on 10GHz on the Saturday, when I can normally work them by tropo scatter at any time. Even 23cm contacts seemed to be suffering this same additional attenuation.

Some of the more notable UK 23cm band contacts include G3CKR/P (IO93) working DLOGTH (JO50) at 916km; G3YJR (IO93) and G4RGK (IO91) both working DF0MU (JO32) at 611 and 558km respectively.

Up on 10GHz there were few contacts above 150km from the UK reported on DX Sherlock [1] and the propagation maps seem to show that the longest distance QSOs took place mainly in the southern part of France and to the east of Germany.

M1CRO/P (JO01), taking part in the RSGB 10GHz Trophy contest on the Saturday, was

reported as working P14TUE (JO21) at 261km.

A number of 10GHz beacons were, however, reported as being received by rain scatter at distances of almost 500km. ON4SHF (JO10) reported hearing beacon F5ZBA (JO06) at 493km and F6DRO (JN03) heard the same beacon at 350km by scatter.

The fact that no reports were received for

these contests seems to be a clear indication that interest in the contest was below normal. It is to be hoped that this will not be the case for the October 'All bands' contests.

My grateful thanks to Gabriel, EA6VQ, for allowing access to QSO information in DX Sherlock.

10GHz SMALL DISH EME SUCCESS.

Following up his recent 24GHz digital QSO success, Rex, VK7MO, has now worked Alan, VK3XPD, on 10GHz by EME using just 8W to a 63cm dish. The contact was achieved by using the JT65C digital mode and timing the QSO for when libration was at a minimum. A 3m dish was used at the VK3 end of the path.

VK1XX's software program was used to automatically tune the IC-910 IF transceivers to track the Doppler frequency shift on both transmit and receive. This meant that the signals remained within a few Hz during the QSO.

The low libration (rapid variation in signal amplitude and phase due to the moon's 'rocking' motion) period that was chosen ensured that the received signals had very low frequency spreading. At the time of the QSO the spreading was no more than 15Hz, whereas well over 100Hz spreading was experienced in the two hour period either side of the successful QSO.

One other feature of the QSO was the use of the Deep Search algorithm as the normal Kotter-Vardy decoder used in the

WSJT program had failed completely to decode anything.

5.7GHz EME PROGRESS. Earlier this year I mentioned that I would be making an effort to become operational using EME (Earth-Moon-Earth, or moonbounce) on the 5.7GHz amateur band. Now, after a slow start, I am able to report some progress with my project.

In the March column I reported that I had obtained a rather nice squeezed waveguide feed for 6cm from John, PA7JB. Although this was picked up at the Dutch Heelweg meeting in January, the choke ring wasn't available until April. **Photo 1** shows the squeezed waveguide feed with three-ring Chaparral choke. With the feed in my hands I felt able to commit to starting work on the project.

By way of explanation, the squeezed waveguide arrangement is designed to provide circular polarisation with minimum excess loss. It basically consists of a long tubular horn feed that contains a section of reduced height waveguide (squeezed). The waveguide is not actually physically 'squeezed' in this feed horn, but rather two block sections are let into the waveguide. The length and spacing of these are critical and designed to produce the circular wavefront emerging from the front of the horn.

Figure 1 shows a basic squeezed waveguide horn feed, from a design originating with Luis Cupido, CT1DMK and Willi Bauer, LX1DB, in *DUBUS* [2] Vol. 33, 2/2006.

All dish feed horns consist of separate and distinct sections. The first of these is

FORTHCOMING MICROWAVE EVENTS

Finningley Microwave Round Table,
Finningley, UK, 14 and 15 July.
Details: Kevin Avery, G3AAF,
kevin.avery@tunstall.co.uk

15th International EME Conference,
Cambridge, UK, 16-19 August.
Details: www.eme2012.com

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

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

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

the launch section consisting, in this case, of two orthogonal (90°) monopoles (transmit and receive) that convert from the coaxial cable interface to the waveguide section. If required this could be a waveguide-fed section with orthogonal launcher, as shown in the original design.

The second part is the polariser that introduces a 90° phase delay to the E or H plane and hence produces circular polarisation. Polarisers can be of several forms. These can be a metallic septum plate inside the waveguide; a dielectric polariser plate inside the waveguide; polarising screws that are inserted into the guide or the squeezed waveguide polariser used in my own horn feed. There are other types of polarisers but these are the most commonly used by EME operators.

The signal that emerges from the horn usually experiences some form of unwanted discontinuity at the rim of the feed horn and this can introduce unwanted back lobes to the main forward lobe. The front section of the horn is often designed to minimise the discontinuity and hence produce a 'cleaner' main lobe.

The W2IMU feed is a popular feed horn design that minimises the discontinuity. Unfortunately this feed is not well suited to illuminating deep TVRO dishes (small f/D ratio). The f/D of a dish is merely the ratio of diameter to focal length. My own dish has an f/D of 0.4. The solution is to use a choke ring arrangement to minimise the discontinuity and control the dish illumination angle so that you can achieve a wide range of edge illumination values.

The choke ring on my squeezed waveguide horn is a three ring Chaparral. This consists of three concentric rings, approximately $1/4\lambda$ deep and whose position can be changed by sliding it along the front section of the feed horn. By this means the edge illumination can be set by measurement of the level of sun noise to cold sky noise ratio. This requires some explanation.

Without the choke ring, pointing the dish, with its feed, towards the sun will result in an increase in noise level. This can be measured using a variety of means. For now I will assume the use of a wideband detector at the EME receiver IF output. Now, moving the dish to point towards a cold part of the sky will result in a (hopefully) large fall in the receiver noise level. The wideband detector is used to measure the change in noise level in dB. This is a sun to cold sky noise measurement.

By changing the position of the choke ring relative to the fixed horn (by sliding it back and forth) a position will be found where the ratio of sun noise to cold sky will be at a maximum. In my case this is with the rim of the feed horn exactly at the calculated focus point, and with the choke ring approximately 15mm back from the rim

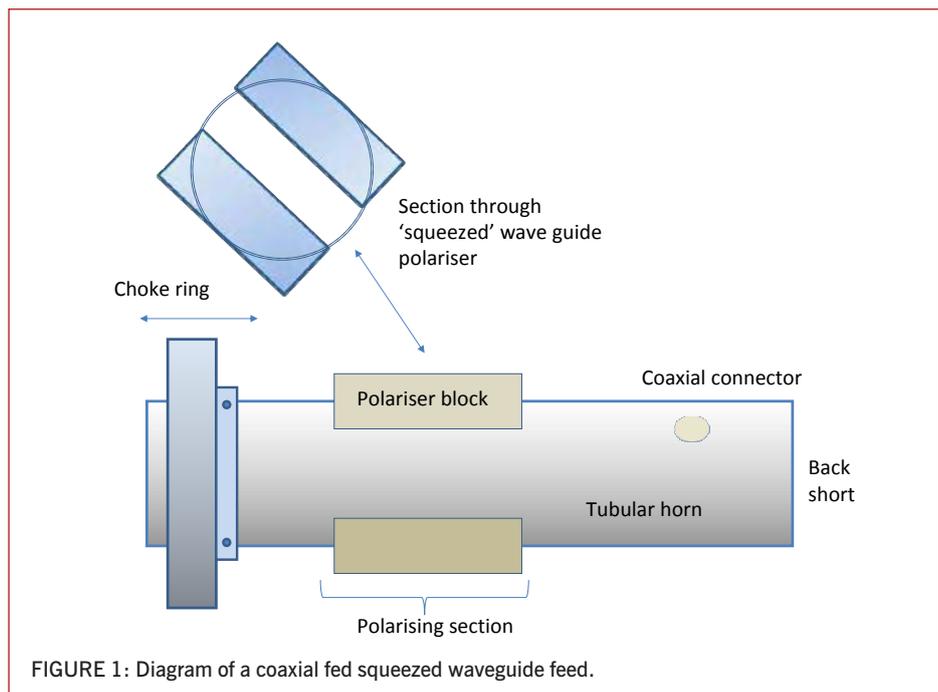


FIGURE 1: Diagram of a coaxial fed squeezed waveguide feed.

of the horn. In scale, this is almost the same point as for my 23cm and 13cm band feeds on the same dish.

I have observed on 23, 13, 9 and now 6cm that the base level noise indicated by the noise detector will change by several dB as the choke ring is moved. This appears to be due to small changes in system gain, even with the small changes in match that the choke ring position causes. It is not to be confused with the ratio of sun noise to cold sky, the ratio of which you are trying to maximise. As the cold sky noise apparently falls (or rises) due to the gain change, so does the sun noise. However the ratio of these will change and should be maximised.

It is possible to confirm the level of edge illumination by connecting a low level (5.7GHz) source to the feed horn and then using a power meter, connected to a small dipole antenna over a ground plane, moving this across the face of the dish and noting how the level changes. It will usually be found the maximum sun noise to cold sky ratio occurs at about -14dB edge illumination. **Figure 2** shows how edge illumination changes from the centre of the dish towards the rim. This is shown as -14dB with respect to the centre of the dish.

Initial results have been very encouraging, with around 10dB sun noise to cold sky ratio at SFI (Solar Flux Index) of 130 and 0.3dB of moon noise. These numbers are a little down on the indicated values [3], but that is not unexpected at this stage as there are number of things to be optimised. I have also discovered that the transverter has rather less image rejection that expected, leading

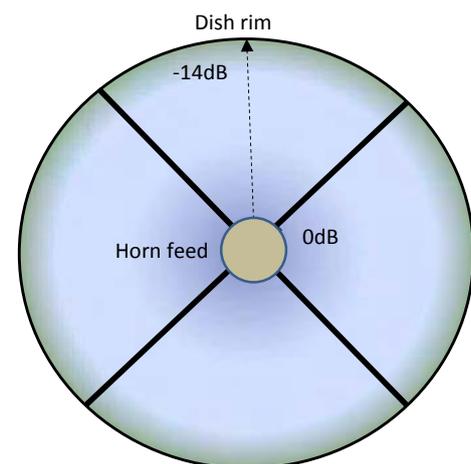


FIGURE 2: Prime focus dish viewed directly from the front (on axis) and showing edge illumination set at -14dB with respect to the centre of the dish. For maximum gain the edge illumination would normally be set at about -10dB.

to optimistic noise figure measurement. Whilst this would probably not even be noticed in terrestrial use, it is significant in EME systems. I have since obtained and tuned up a rather nice 5.7GHz filter that, when used between a low noise preamp and the main transverter, will give me more than 50dB image channel noise rejection.

CORRECTION. In the May column I showed a 23cm EME dish belonging to Brian Justin. I attributed the wrong callsign. Brian's callsign is WA1ZMS and not as indicated. I apologise to Brian for this error.

WEBSEARCH

- [1] DX Sherlock – www.vhfdx.info/spots
- [2] CT1DMK horn feed
– http://www.qsl.net/ct1dmk/cp_feed_dmk06.pdf
- [3] EMECALC – www.vk3um.com

EME 2012 Conference



Photo: G7OCD.

BACKGROUND. The 15th International EME Conference (EME2012) is organised by the UK Microwave Group, supported by the RSGB, with Waters and Stanton PLC as the principal sponsor. The conference will be held at Churchill College, Cambridge on 16 to 18 August 2012.

Cambridge was chosen as the venue for the conference because of its world renowned and historic colleges. From these the city has now developed to become the technology centre of the UK, with many large and well known companies located in and around the city. Cambridge has excellent transport connections to the rest of the UK, with the M11 motorway, A10, A11 and A14 roads all converging in the area, direct rail services from London's Kings Cross station and frequent coach and rail services from Stansted airport.

Not only does Cambridge house many fine colleges dating from the 13th Century, it also contains many museums, institutes, churches and other fine buildings to visit. It hosts several world famous restaurants as well as tea and coffee houses. Cambridge is truly a tourist Mecca.

Registrations for the EME Conference have already exceeded the organisers' expectations at this early stage and are set to be close to a record for the event. However, we would still like to encourage even more UK delegates to attend.

HIGHLIGHTS. The conference features a two-day series of presentations, with more than 20 UK and overseas presentations in the programme. Amongst the presenters are Nobel Prize winner Joe Taylor, K1JT, who will be talking about his latest version of the MAP65 digimodes communications program. MAP65, together with the WSJT suite of applications has already revolutionised

modern amateur radio communications, allowing us to identify multiple stations and communicate with individual stations using much weaker signals than hitherto possible. In the EME world this has led to many more radio amateurs having access to world-wide communications using the ultimate DX path.

Doug Arthur, VK3UM, will be talking about EME system performance

and what you need to do to ensure that your system is working to its very best capability. Doug's insight into EME systems is unequalled and his suite of EME related applications is probably one of the best and most used assistants that the EME operator can have.

Ian White, GM3SEK and Dave Stockton, GM4ZNX will bring us down to earth with wise words about noise figure measurement and they will provide a reality check on some of the current claims for low noise figure receivers in this much-misunderstood subject area.

Emphasising the strong links between EME and amateur radio astronomy, David Morgan will talk about practical methods that can be used to receive truly DX signals over 54 million light years from Virgo A, whilst Daniela de Paulis will talk about some interesting visual applications in EME.

Looking to the future Charlie Suckling, G3WDG, will be giving an insight into the future uses of Gallium Nitride (GaN) technology and what it will mean for integrated power amplifier and antenna feed designs.

At these conferences it is also common to describe new, practical, equipment designs and so Charlie will also be describing a new 13cm receive converter design whilst Alex Artieda, HB9DRI, will describe an advanced IQ receiver that will reduce some of the Faraday rotation problems experienced with VHF and low UHF EME reception.

In recent years a great

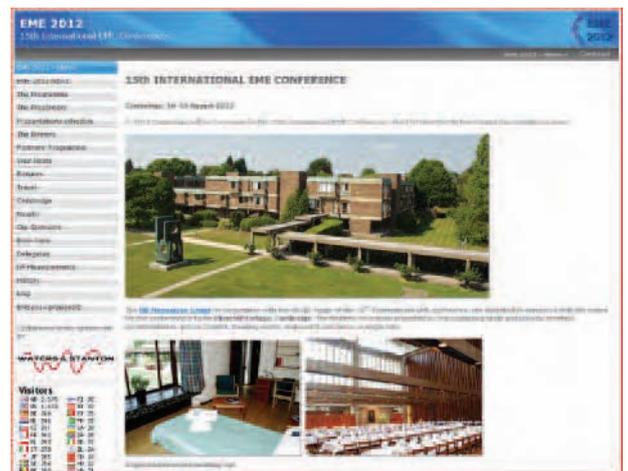
deal of modern, low cost, surplus wireless equipment has started to appear on eBay and at car boot sales. Some of the power amplifiers, in particular, can be readily modified for use in both EME and terrestrial systems. John Worsnop, G4BAO and Manfred Ploetz, DL7YC, will be talking about how to modify some of these amplifiers for amateur radio use.

All this great information will be available in the conference proceedings and on the accompanying DVD. Ian White, GM3SEK, who is well known as the *RadCom* 'In Practice' columnist, is compiling the proceedings and you can be sure these will be much-prized publications. Of course, to be sure of getting your copy, you should attend the conference!

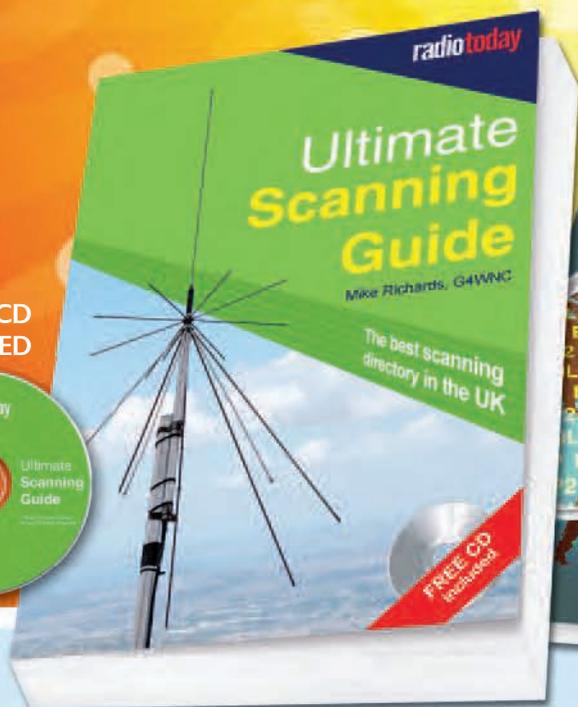
BOOKINGS. For those who are only able to attend for the two days of the conference and who would like to book accommodation at Churchill for the Friday night, Package 'L' is available. Package 'L' includes refreshment and lunch on both conference days, Friday dinner and B&B on Friday night and two day passes. You will also need to separately book Registration. All other conference options are still available, from individual day passes to 4 night accommodation packages. Full details can be obtained at www.eme2012.com.

If you are unable to attend, but operate 144MHz EME, look for GB2EME, which will be remotely operated from the conference site.

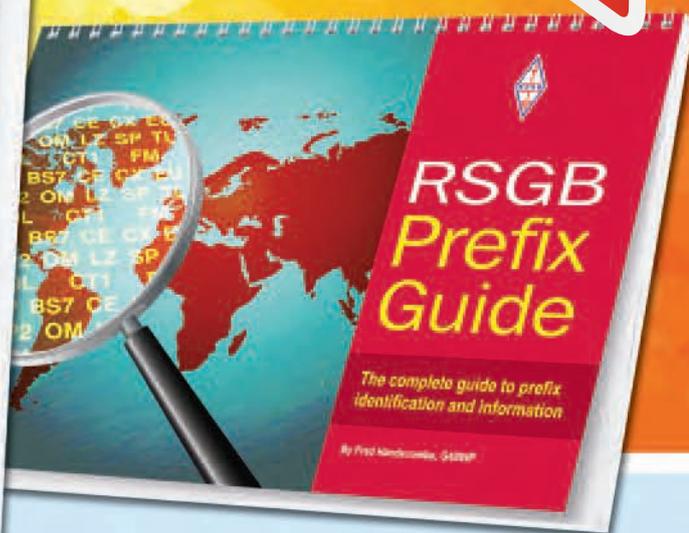
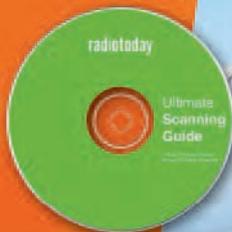
EME2012 is a not-for-profit event.



Home page of EME2012 website.



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Ultimate Scanning Guide

By Mike Richards, G4WNC

Following a major overhaul of the data we can now offer a brand new fourth edition of the famous *Radio Today Ultimate Scanning Guide*. This book builds on the superb reputation of the previous editions and popular CD with the most up to date and accurate frequency information available.

For those not familiar with scanning directories, the *Radio Today Ultimate Scanning Guide* provides a comprehensive listing of who is broadcasting on a given frequency. The reader is also provided with clear guidance as to what is available to listen to and what should be avoided. When it first appeared in the *Radio Today Ultimate Scanning Guide*, the CD caused a sensation and the new version is significant step forward. With improved interface and lightning quick searching, this is a boon to any scanning enthusiast. The software element of the CD contains a wide range of radio specific software. In addition, scanning enthusiast Chris Lorek, G4HCL has provided a useful guide to scanning and what is available to be listened to.

Radio Today Ultimate Scanning Guide presents the frequency data in a new easy to use format that will please regular users and this combined with the new interface CD makes an unbeatable combination. If you are a long standing scanning enthusiast or new to the hobby then you will find this book a 'must have' for your book shelf and the yardstick by which every other book in this field is judged.

RSGB Prefix Guide

10th Edition

By Fred Handscombe, G4BWP

Fully updated and with a "new look" design this edition of the *RSGB Prefix Guide* provides the latest and most comprehensive list of the world's amateur radio prefixes. The listings also provides a huge range of addition information covering references for continent, CQ Zone, DXCC, IOTA, ITU Zone, Latitude & Longitude and a whole lot more. The very latest DXCC information is included with an unprecedented five new DXCC entities being added and two deleted.

If you are interested in DX, awards or simply operate the HF bands the *RSGB Prefix Guide* is the book for you. From the basic "what was that Call?" question through to research for an elusive award, this book provides what is needed. From DXCC deleted entities, Russian & CIS entities etc the popular DXCC checklist is here, along with very latest information on various award programs including IOTA, CQ WAZ, DXCC, WAS and others. There is also an index of countries and their callsign allocations divided by continent as are more detailed listings for the wide range of RSGB awards for HF and 50MHz.

If you are new to amateur radio or an experienced hand the *RSGB Prefix Guide* in its popular lay flat design is a must for every DX hunting radio amateur.



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The GR100MGY Experience

Commemorating the life of local hero, Jack Phillips, Chief Radio Officer on the *Titanic*.



The 20m monobander + WARC dipole used for GR100MGY operations.

BACKGROUND. Television, radio and the press coverage made sure that we were all reminded about the loss of the Royal Mail Ship (RMS) *Titanic* 100 years ago. *Titanic* was issued with the callsign MGY and radio played an important role in the rescue efforts. The Chief Radio Officer, Jack Phillips, had his home in Godalming, Surrey. The Wey Valley Amateur Radio Group (WVARG) in Guildford decided to honour his memory and the role of radio and telegraphy in the service of safety of life at sea during the last 100 years by operating a memorial station, GR100MGY, for the duration of the original voyage.

John George 'Jack' Phillips was born in Farncombe, near Godalming, Surrey. He finished school in 1902 and began working

at Godalming Post Office, where he learned telegraphy. He started training to work in wireless for the Marconi Company in March 1906 in Seaforth and graduated five months later. He served on a number of White Star Line ships, before he was sent to Belfast to be the senior wireless operator on board the *Titanic* for her maiden voyage. After the *Titanic* struck an iceberg on that fateful night of 14 April 1912, Jack remained at his Morse key, summoning help from the *Carpathia* and thus was responsible for saving many lives. For this reason, Jack is something of a local hero in Godalming, where his life is remembered in a memorial garden.

The plan to commemorate the 100th anniversary of Jack's last voyage started 10 years ago with GB90MGY that was set up in the centre of Godalming by a group of local amateurs, some of whom are members of WVARG and others of our supporting club, the Guildford and District Radio Society (GDRS), with support from the town of Godalming. This was followed 5 years later by GB95MGY operating from Godalming College.

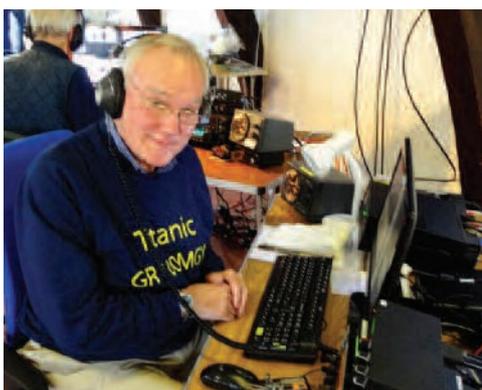
GR100MGY. GR100MGY was set up at Charterhouse on the outskirts of Godalming, within a mile of where Jack Phillips was born and bred. Mike, GOEFO initially approached the Charterhouse Bursar in October 2008 and put forward a proposal, with valuable support from the Godalming town Clerk and Waverley *Titanic* events committee. The Bursar agreed and provided 100% support during the planning, installation and operation of the station. We were given use of the Crown building (the Sixth Form Clubhouse) and Charterhouse left us to do our own thing, subject to providing a full Health and Safety risk assessment to safeguard public visitors and school staff. GDRS member, Nigel, G1XBV

undertook the Health and Safety risk assessment and produced all the formal documents, which were accepted without question.

The station planned to use two 60ft trailer towers supporting dipoles for 80m and 40m, a trap dipole for the WARC bands 30m-17m-12m, a 3-element Yagi for 20m and a 3-element tribander for 15m-10m. One station used an Elecraft K3 and KPA500 amplifier while the other station used an Icom transceiver and PW1 amplifier. Both stations were fully automated. Antennas were selected automatically, while band-pass filters and high-power low-pass filters made sure we could operate both stations continuously without any mutual interference or any trace of RF in the shack. Networked computers did the automation and logging through *WinTest*. GR100MGY QSL cards were designed by Alex, G3IAZ and Roger, G3SXW kindly offered to act as our QSL manager.

OPERATION. Manning two stations 24 hours a day with good CW operators was clearly going to be a challenge for a small local radio club. Roger, G3SXW, a WVARG member, kindly accepted this daunting task. Given his experience of running CQWW winning multi-operator stations from West Africa, we clearly had the right man for the job. Although WVARG has a number of good CW operators, covering all the available operating slots was an impossible task, so Roger drafted in several guest operators. Many of the guest operators travelled significant distances to join us at Charterhouse, in many instances opting for the night shifts.

Finally the morning of 9 April arrived and it was time to start work. The Charterhouse buildings and playing field looked wonderful in the early morning light. Was this great public school really going to let us put two 60 foot



GOEFO operating the station.



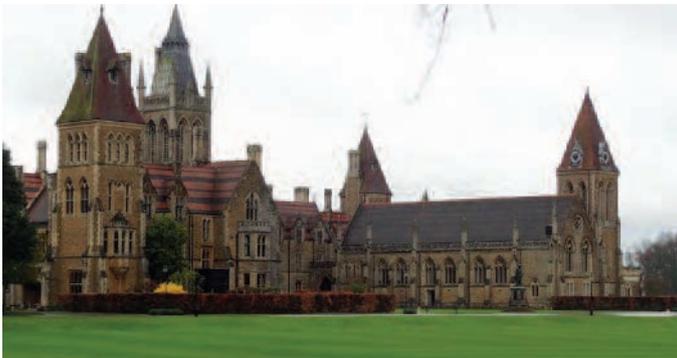
Olof, G0CKV operating the station.



Dave, G3YXX is running the pile-up and *Win-Test* log using his Braille keyboard.



One of two 60ft trailer towers supporting dipoles for 80m and 40m, a trap dipole for the WARC bands 30m-17m-12m, a 3-element Yagi for 20m and a 3-element tribander for 15m-10m.



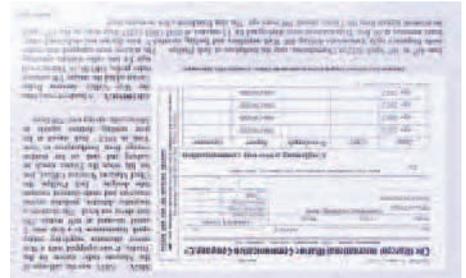
Charterhouse school kindly opened their doors to GR100MGY.

mobile towers on their beautifully tended grass? Yes, of course they were and gradually tribanders were assembled, wires were strung and the antennas raised into position, complete with a White Star Line flag donated to the station by Godalming museum. Meanwhile Olof, GOCKV and Kazu, JK3GAD/MOCFW were assembling the station in the Crown building. We had exclusive use of this lovely old building, placing the two stations on the first floor, leaving the ground floor for the public exhibition. Everything went together as planned and we were almost ready to start operation the following day, to coincide with the 100th anniversary of the *Titanic's* departure from Southampton. Godalming Council had kindly offered to provide fencing to contain our antenna farm and their man arrived promptly on the morning of 10 April. The station installation was complete.

At 1200GMT on 10 April, both stations went on the air and were greeted by large

pile-ups wanting to work us. The four hour operating shift system prepared by Roger, G3SXW, worked like clockwork. Operators arrived on time for their allotted sessions, sat in the chairs and piled up page after page of contacts in our station log. No fuss, no drama, just round the clock CW, day after day. The station was open to the public over the weekend of 14 and 15 April, with one station on CW and the other on SSB. GDRS provided a replica *Titanic* radio room, which was originally built for GB90MGY. Dorking and District Radio Society provided Ken Tythacott with his exhibition of telegraphic memorabilia and Surrey RAYNET showed their emergency control vehicle, plus a small exhibition stand. Godalming museum's *Titanic* archivist, John Young attended on the public days, resplendent in his Radio Officer's uniform, with various *Titanic* artefacts, postcards and pictures. The Mayors of Godalming and Waverley formally opened the station on Saturday, before the arrival of approximately 200 visitors.

PACKING UP. At 0700GMT on 16 April, it was all over. Towers were lowered, cables reeled in, stations were packed away and by midday the glorious playing fields of Charterhouse had returned to normal, as if GR100MGY never



The QSL card that includes the painting of the *Titanic* by Jim Manniso, with thanks for the copyright permission to use the painting.

existed. The whole setup worked without serious glitches for the whole period except for a couple of inevitable issues with finger trouble. Charterhouse proved to be an excellent HF radio site that was electrically quiet, with excellent take-offs in all directions.

RESULTS. GR100MGY made 15,735 QSOs on CW and 875 on SSB. The Wey Valley Amateur Radio Group wishes to thank Ofcom for the special call sign; Godalming and Waverley Councils; Charterhouse for their considerable support and only ever saying 'yes' when faced with our strange and bizarre requests; Icom UK for their generous loan of transceivers; Guildford & District Radio Society for their help and support with antenna towers, Health and Safety documentation and the replica *Titanic* radio room; Barnabas Communications and the Red Cross (Jon Richards) for loan of towers and Jim Manniso for copyright permission to use his splendid painting of the *Titanic* on our QSL cards. Last, but certainly not least, Tony, G6ZAC our Site Manager, all the operators: G2DBH, G3IAF, G3IAZ, G3SXW, G3YXX, G4HZV, G4IRN, GOCKV, GOEFO, GOSJH, M3OSP, MOGJH and guest operators: G3LIK, G3OGP, G3RWF, G3XTT, G3ZYV, G3XAQ, G4DJX, G4FON, MODHO and MODXR.



The White Star Line flag donated to the station by Godalming museum.

House training a Palstar PS-50

Taming this workhorse PSU's noisier habits



PHOTO 1: The Palstar PS-50 PSU is a rugged, rack-mountable unit.

INTRODUCTION. The Palstar PS-50 linear power supply will be familiar to many. It is a solid, straightforward design that provides a fixed 13.8V output at 40A continuous, 50A peak. It is more than capable of running most of your shack equipment. It also frequently appears on the second hand market at very attractive prices when compared to units of a similar capability.

There are, however, a couple of issues when used in a quiet shack or domestic environment. First the fan, which only runs when the internal heat sink temperature exceeds 40°C, is VERY loud and secondly (I suspect this varies between units & users) there may be a noticeable hum from the transformers, often enhanced by where and on what the power unit is mounted.

A brief search of the internet revealed others expressing similar experiences but unusually there were no published resolutions. So to address the issues it was decided to make two modifications: to mechanically

decouple the transformers from the chassis to prevent the transmission of vibrations and, secondly, to replace the fan with a quieter product. I also decided to modify the fan controller such that the fan runs continuously at reduced speed providing a permanent air flow through the unit and consequently a lower average operating temperature. It will switch to full speed when necessary.

Not all of these modifications need be done, but if you do suffer from a 'hummy' unit, it is suggested that the transformer mountings are done first this avoids the need to remove the controller / regulator board twice. Some may find it sufficient simply to alter the fan circuit without bothering to replace the fan.

WHAT'S IN THE BOX? The PS-50 internals are laid bare in **Photo 2**. The fan is at the rear right hand corner, behind the heatsink that holds the series pass transistors, bridge rectifiers and the small green temperature

sensor. The controller / regulator board is mounted vertically at front left, with the two hefty mains transformers to the rear.

TRANSFORMER MOUNTING

MODIFICATION. Each transformer is fixed to the chassis from below with four M4 screws. The first modification involves adding rubberised 'bobbin mounts' (also known as anti-vibration mountings or cylinder mounts) in all 8 positions.

The bobbin is 10mm in diameter with a body length of 8mm (**Photo 3**). It has an M4 stud at one end and M4 captive thread at the other which accepts a screw length of approximately 5 to 6mm. Suitable mounts are available from RS (stock code 720-3313) and other component distributors; you may also find them on eBay.

Caution – using a longer thread length may damage the bobbin and / or reduce its effectiveness.

Unplug the PSU from the mains, remove the top cover and carefully stand the unit on its left side. Remove the two screws securing the controller / regulator board and unplug the connectors. The connectors may have some locking compound on them. If so, carefully remove this to free the connector, otherwise the force required to remove them will cause damage. When handling the board be careful not to alter the settings of any of the preset potentiometers.

The transformers are heavy, so support what is now the lower transformer. I found small mug mats were ideal – see **Photo 4**. Remove the fixings. Retain the large washers, as these will be used later. With the transformer free, the bobbins may be installed. Do not replace the transformer at this stage as it is convenient to use it to support the second transformer. This should be removed and the bobbins fitted in the same way.

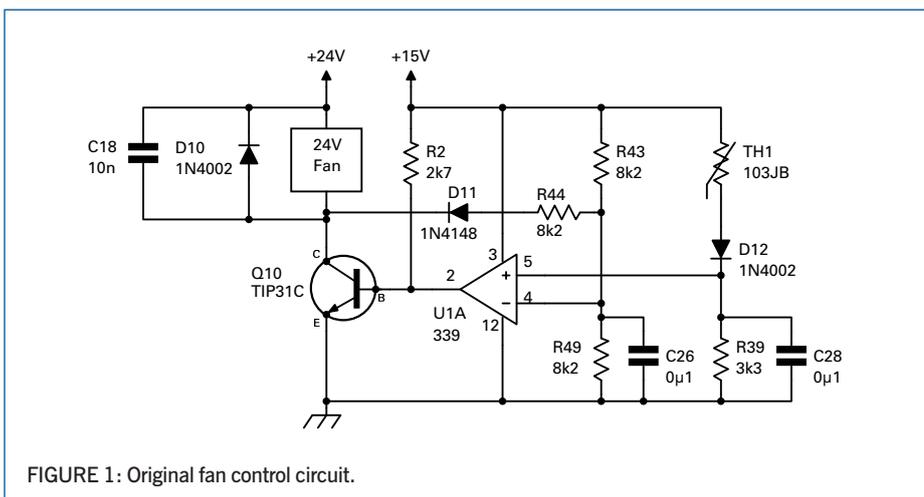


FIGURE 1: Original fan control circuit.

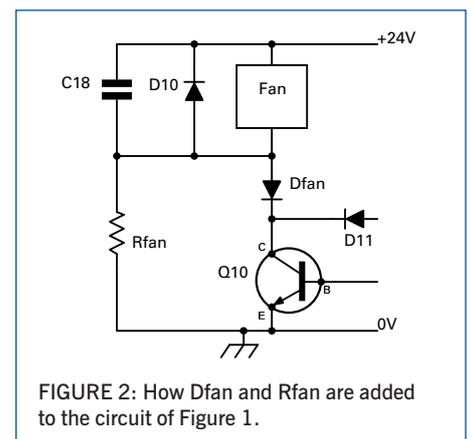


FIGURE 2: How Dfan and Rfan are added to the circuit of Figure 1.

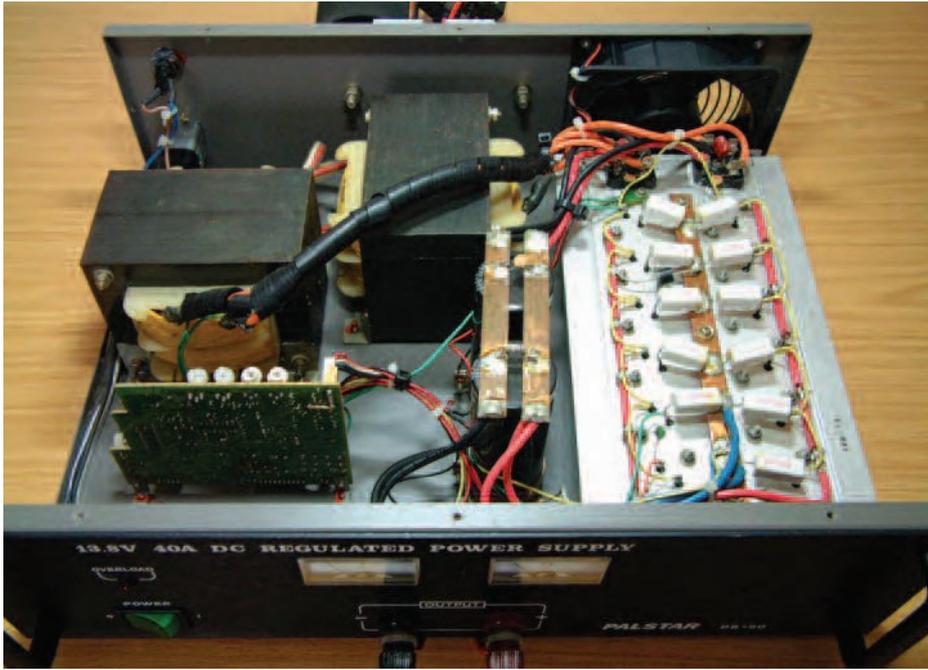


PHOTO 2: General view inside the Palstar PS-50.



PHOTO 3: One of the bobbins used to mount the transformers.

Although a little restrictive, there is enough play in the wiring to both transformers to allow this to be done, carefully, without the need to make any disconnections.

Carefully refit the transformers using new M4 x 8mm screws, spring washers and the original large flat washers. Ensure the screws protrude no more than 5mm into the bobbins.

Important: the bobbins also isolate the transformers electrically from the chassis therefore a short earth wire should be run from each transformer body to the chassis.

FAN MODIFICATION. The original fan is a 120mm x 120mm x 38mm 24VDC unit mounted at the rear right hand corner of the power supply. It is controlled from the controller / regulator board and is configured to expel air, ie it sucks air through the unit. The modification involves replacing the fan with a quieter alternative and adding a couple of components to the controller / regulator

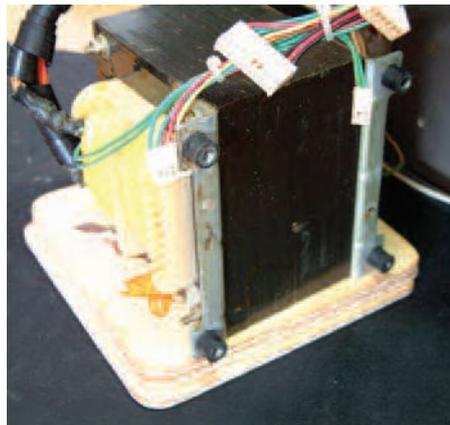


PHOTO 4: Bobbins mounted on a transformer. Note that you will need to add an earth wire between the transformer and chassis because the bobbins are electrical insulators.

board to allow the fan to run continuously at a reduced speed, increasing to full speed only when the temperature rises above 40°C. The fan I used was Rapid Electronics part number 37-0668.

Figure 1 shows the original fan control circuit. Thermistor TH1 (mounted on the heatsink) senses the temperature. As the heatsink gets warmer, the resistance of TH1 falls, causing the voltage on the output of U1A to rise. At a certain point Q10 will turn on, activating the fan and, via D11 and R44, providing hysteresis to the opamp circuit so that the fan keeps running until the heatsink has cooled somewhat and the resistance of TH1 has increased.

Figure 2 shows the suggested modifications to the circuit. Rfan allows a small current to flow through the fan when Q10 is

turned off, keeping the fan running at a lower than normal speed (but sufficient to cause some cooling effect). Dfan prevents this voltage upsetting the hysteresis circuit. The value of Rfan needs to be determined experimentally, although for the fan specified a 470R 4W wirewound resistor was found to be ideal. Should an alternative fan be used it may be necessary to select a different value. The diode used was a 1N4003 but any similar diode will do.

The easiest way to make the circuit modification is to cut the PCB track arrowed in **Photo 5**, then add Rfan and Dfan as shown. Check your work, then reconnect the controller board and return it to its original position.

Remove the original fan and fit the replacement, paying attention to the direction of air flow as mentioned earlier. The specified fan will require 4 x M4 x 35mm screws, nuts, flat washers and serrated washers. It should be found that the original fan wires were extended, the joints being insulated with heat shrink sleeve. Locate the joints, remove the sleeves and de-solder. Fit new heat shrink sleeves, connect the new fan and shrink the new sleeves in place.

Visually check everything that's been done before connecting the mains power and testing. The fan should start and run at reduced speed. If the switch to high speed is to be checked, the simplest and quickest way is to carefully raise the temperature of the heat sink sensor with a hair drier. Once you are satisfied with your work, switch off the PSU, unplug it, then replace the top cover.

CONCLUSION. My PSU, with modifications, has now been in use for some while and is pleasingly quiet. Prior to the modification, even with only a few amps being drawn, the temperature would rise to the point at which the fan would start. By contrast, the unit will now run for many hours, under the same conditions, without a significant temperature rise. Even when operating at high speed, the lower noise of the replacement fan is more than acceptable.

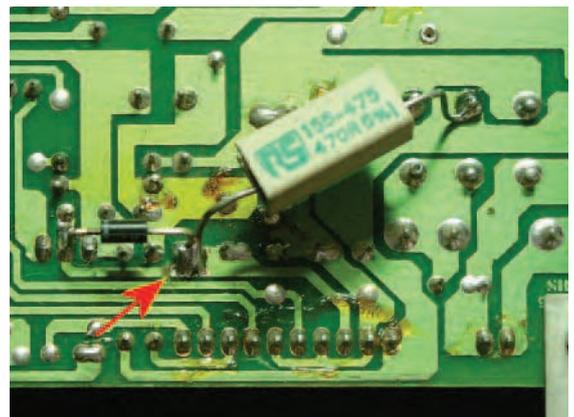


PHOTO 5: Modifications to the fan control circuit. Note track cut (arrowed).

Book review

A wide variety to choose from

Pigeon Guided Missiles And 49 other ideas that never took off

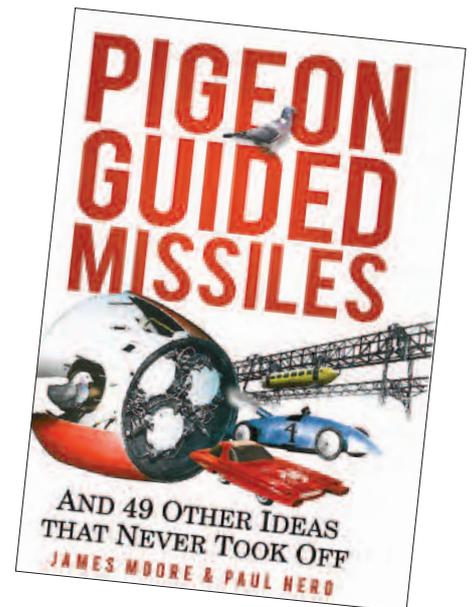
By James Moore & Paul Nero

This is one of those wonderfully offbeat books that crosses my desk from time to time. As its name and subtitle promise, it contains details of 50 projects, large and small, that didn't quite make it. Some failed because of fundamental impracticalities, like the steam-powered airliner that never really got off the ground. Others, such as the X-Ray shoe fitting machine worked, but had awful side-effects. Then there is the city that built an underground railway system in the 1910s and 20s that remains, to this very day, largely intact but completely unused.

Told in a matter-of-fact manner, these stories

convey fascinating glimpses into bygone eras. For example, whilst relating the tale of "Chadwick's Miasma-Terminating Towers", we are treated to a snippet from an 1861 Statistical Society of London report into slum overcrowding. Researchers "visited a single room occupied by five families, four of which ate, sat and slept in the corner each, with a fifth family in the middle. One woman told the investigators, 'We did very well until the gentleman in the middle took a lodger.'"

I liked this offbeat book and its celebrations of dedicated battiness.



ISBN 978-0-7524-5990-5

Published by The History Press

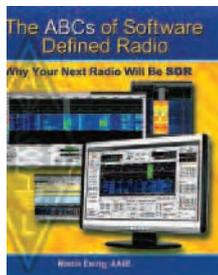
258 pages, 133 x 205mm approx

Non-Members' Price £12.99

Members' Price £9.74 (25% off)

The ABCs of Software Defined Radio

By Martin Ewing, AA6E



It sometimes seems as though you can't move without coming across software defined radio. In truth, it's the first Big Thing to hit amateur radio since the adoption of SSB in the 50s and 60s, or the introduction of the superhet in the 1930s. The subtitle of the book says it all – "Why Your Next Radio Will Be SDR". A big claim, perhaps, so let's see if it's justified.

One of the great plus-points of the book is that it keeps most of the descriptions at a fairly high level. I found I gained understanding most of the building blocks in general terms without having to descend into maths. It soon becomes apparent that most of the software elements can be regarded as interconnected 'black boxes' that have a specific function – just as most people regard traditional components such as filters in a similar fashion. However, thanks to the fact that the software elements can be perfect models of a required function, SDR performance can be streets ahead of anything that could be economically made in the physical world. The era of true 'brick wall' filters has arrived.

There's a nice summary of the types of SDR gear currently on the market, ranging from the inexpensive SoftRock kits through wideband direct sampling receivers like Perseus to high quality SDR based transceivers such as the

Ten-Tec Omni-VIII and the Flexradio Flex series. Another important point that's covered quite well is the computer needed to run most SDR implementations.

I've skipped over several sections but it's the final chapter – "Coming to a shack near you" that addresses the claim on the cover. It mentions how widely available SDR now is from QRP onwards, enables novel communication modes and features (such as CW Skimmer) and the fact that most new commercial transceivers are based, one way or another, on SDR DSP techniques. I think AA6E has a fair point.

The last few pages are given over to two glossaries and a useful index. The first glossary describes, in quite non mathematical terms, how a simple SDR receiver based on a Quadrature Sampling Detector works. The second is a glossary of many of the new terms associated with SDR, which is invaluable for the beginner.

Its 64 pages contain a great deal of useful and thought-provoking information that will leave you with a far better understanding of what software defined radio is – and to some extent where it is likely to go in the future. My only reservation is that it is quite expensive (at about £15 plus postage) for such a slim volume.

ISBN 978-0-87259-632-0

Published by ARRL

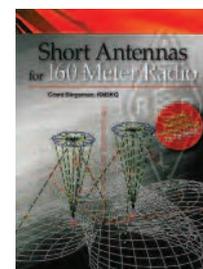
64 pages, 191 x 223mm approx

Price US\$22.95

Available from ARRL

Short Antennas for 160 Meter Radio

By Grant Bingeman, KM5KG



"Learn the Secrets of Compact Design for Top Band" says the cover. It is a relatively scholarly work that investigates around 25 antennas variations, mostly variations on a 30-foot vertical,

although inverted-L, horizontal and a few other antennas also get a mention. All are investigated via some 260 downloadable Method of Moment files that are compatible with EZNEC PRO. You will also need NEC-4 for best results.

Overall, I found the book's single figure of merit approach to evaluating antenna performance underwhelming and the text uninspiring. As is often the case for Top Band antennas, "compact" is a relative term, although none of the antennas had any single dimension approaching the length of a Top Band dipole.

It may be that this book will appeal to the dedicated antenna modelling enthusiast but it's definitely not for everyone.

ISBN 978-0-87259-579-8

Published by ARRL

64 pages, 210 x 276mm approx

Price US\$22.95

Available from ARRL

The Rig Guide, 6th Edition

Edited by Steve White, G3ZVW

The Rig Guide has an enviable track record as the definitive amateur radio equipment guide. It is the reference for radios of the last 20 years or so – what they look like, their specs and, perhaps most importantly, their value.

After some interesting introductory material that includes a very useful glossary of terms, the book launches into the equipment information table. This is organised by manufacturer, in alphabetical order. Divided into sections by manufacturer, the table includes a photograph, the date of any *RadCom* review, a brief description of the equipment and guide prices for new, second hand and cash trade-in value. Receivers, transceivers, handhelds, amplifiers, DSP devices – there are well over 400 pieces of equipment listed.

A typical example is the entry for the Icom IC-9100. There's a small photograph, good enough to identify the radio, which is overprinted with a banner saying "Reviewed in *RadCom* April 2011". The description reads, "HF-70cm multi-mode base station transceiver. FM/AM/SSB/CW/RTTY. 99 memories per band. 2 independent receivers.

Memory keyer. RTTY decoder. Auto ATU (HF-6m). CTCSS. DCS. Voice synth. USB interface. Optional DSTAR and 23cm modules. Output power: 2W-100W (2W-25W on AM) 2W-75W on 70cm. Frequency range: 1.8-450MHz Tx (amateur bands), 1240-1320MHz (optional), 30kHz-60MHz, 136MHz-174MHz, 420MHz-480MHz Rx, 1240MHz-1320MHz Rx (optional)". The all-important price guides say that the new price is £2850-2900, second hand £2200-£2300 and the cash trade-in value is given as £1230-£1540.

After the equipment list is a comprehensive index of all the equipment reviews that have appeared in *RadCom* since January 1990.

The last part of the book contains some example *RadCom* reviews: the Flex-1500 software defined transceiver plus a clutch of handhelds – two each from Icom and Wouxun and one from Alinco.

If you are thinking of buying or selling any radio equipment, *The Rig Guide* is an



invaluable resource that could easily save you money – or help you spot a bargain.

ISBN 9781-9050-8680-1
Published by RSGB
96 pages, 210 x 297mm
Price £5.99, post free

Hints & Kinks for the Radio Amateur – 18th Edition

Edited by Steve Ford, WB8IMY

Hints & Kinks is a popular column in ARRL's magazine, *QST*, and this book is a compilation of the best bits published between January 2005 and December 2011. It is an amazing treasure-trove of largely quick-fire (short but good) tips and tricks of interest to the amateur.

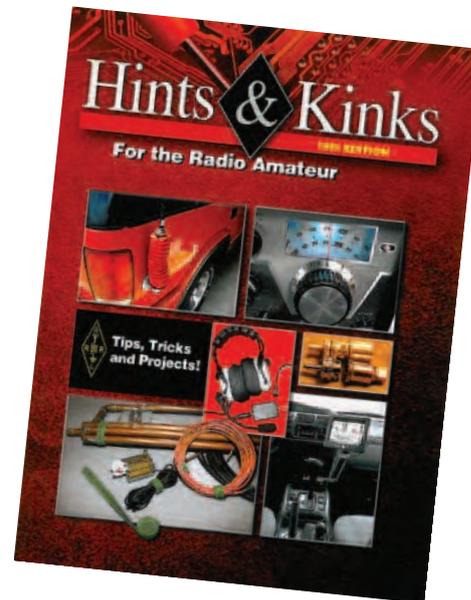
The book is divided into eleven sections: Equipment tips and mods, Batteries and other power sources, Mobile and portable stations, Software and computers, Troubleshooting and test gear, Restoration, Construction and maintenance, Antenna systems, Operating, Around the shack and Interference (RFI/EMI). I apologise for the list but it does demonstrate the very wide range that this book covers. I counted around 400 of these snippets, which range from a few lines to a page or more in length.

How can I give a flavour of a book that contains such gems as using a pipe fitting to couple two cigarette lighter plugs together pin-to-pin, a radio controller head mount

made from bits of stationery, adds a cooling fan to a commercial dummy load, builds a high power valve linear into a filing cabinet and makes a microwave antenna radome from a pizza tin, fence post cap and a jubilee clip? And that's not to mention the giant catapult for launching grapefruit-weighted antenna wires over trees, using coaxial cable to clean drains (really!) or making antenna insulators from offcuts of PVC conduit – there are hundreds more, highly diverse examples.

Browsing through is absolutely fascinating. Whatever your interest in amateur radio, you're certain to have an "I wish I'd thought of that" moment as you work your way through it. I liked the way that the hints & kinks are presented in a no-nonsense style: every word counts and there is very little waffle.

True, it may not solve every problem in your amateur radio life, but it does contain a vast repository of lateral thinking and ingenuity. I found it very thought-provoking



and have no hesitation in recommending it as a valuable addition to any amateur's bookshelf.

ISBN 978-0-87259-520-0
Published by ARRL
192 pages, 210 x 276mm approx
Non-Members' Price £18.99
Members' Price £16.14

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.

Antennas

The homebrew Yagi and common mode problems



PHOTO 1: The G8PJC 145MHz three-element Yagi located in the loft. The elements are not hard drawn copper so need to be supported on wood battens.

HOMEBREW 145MHz YAGI. Before the days of computer modeling of antennas I used to model HF antennas using VHF antennas. Of course a model VHF antenna can be used for normal VHF activity and, if weather protection isn't an issue, the construction can be very simple with the antenna being made from wire and wood. An example is that of a three-element Yagi using 2mm hard-drawn copper for the elements. These are fixed to a wooden boom with wire netting staples, as shown in Figure 1. The antenna dimensions are:

145MHz: D=940mm, A=990mm, R=1072mm, S1=250mm, S2=313mm

430MHz: D=310mm, A=322mm, R=352mm, S1=103mm, S2=103mm.

The total length of the VHF antenna gamma match is 150mm and the spacing is approximately 26mm. This spacing is not critical.

THE G8PJC ANTENNA. John McDonald, G8PJC, needed a 145MHz directional antenna so that he could communicate with Bracknell Radio Amateur Club members. He built the antenna shown in Figure 1 and fixed it in his loft as shown in Photo 1. He says, "My version of the VHF Yagi is made from 2.5mm² mains wire supported on a wood battens with the driven element fed via a gamma match. Connection to the coax feeder is via a terminal block and a PL259 socket.

"The problem with the antenna is a high level of common mode signal on the coax cable as detected by changes in SWR when the down lead is moved or the cable touched. All the testing is carried out with a MFJ-259 analyser. I would like to know what to expect from this antenna and how should it be tuned."

I don't recall having common mode problems with the VHF Yagi feeder when I originally built my antenna. At the time (1989) I didn't have instruments such as the MFJ259. I just used an old valve transmitter and a SWR meter.

I needed to investigate these problems but my original Yagi had long gone, so I felt

there was no alternative but to build a new one. I didn't have any 14SWG (2mm) hard drawn copper wire. The only material available was 16SWG (1.6mm), which seemed is a bit thin for the elements of a 145MHz antenna. However, I did have some 10SWG (3.2mm) enamelled wire among my antenna material so I used that. The new antenna is shown in Photo 2.

You may notice small extensions to the length of the driven element – I had originally cut this element too short. The rule for measuring and cutting (forgive the pun) antenna elements is the same as for carpentry or joinery – measure twice and cut once.

The antenna was placed on top of a plastic garden table as shown in Photo 2 but when I came to adjust the gamma matching adjustments I found it impossible to get a low SWR on the MFJ-269. Repositioning the antenna so that it was about quarter of a wavelength above the surface of the table on a wooden box made a huge difference. It was now possible to obtain a feeder to antenna match as shown in Photo 3 and Figure 2.

DETUNING EFFECTS. There was something strange about this table. Plastic is used throughout its construction, including the legs. The detuning effect caused by the table was worse than when the antenna was placed

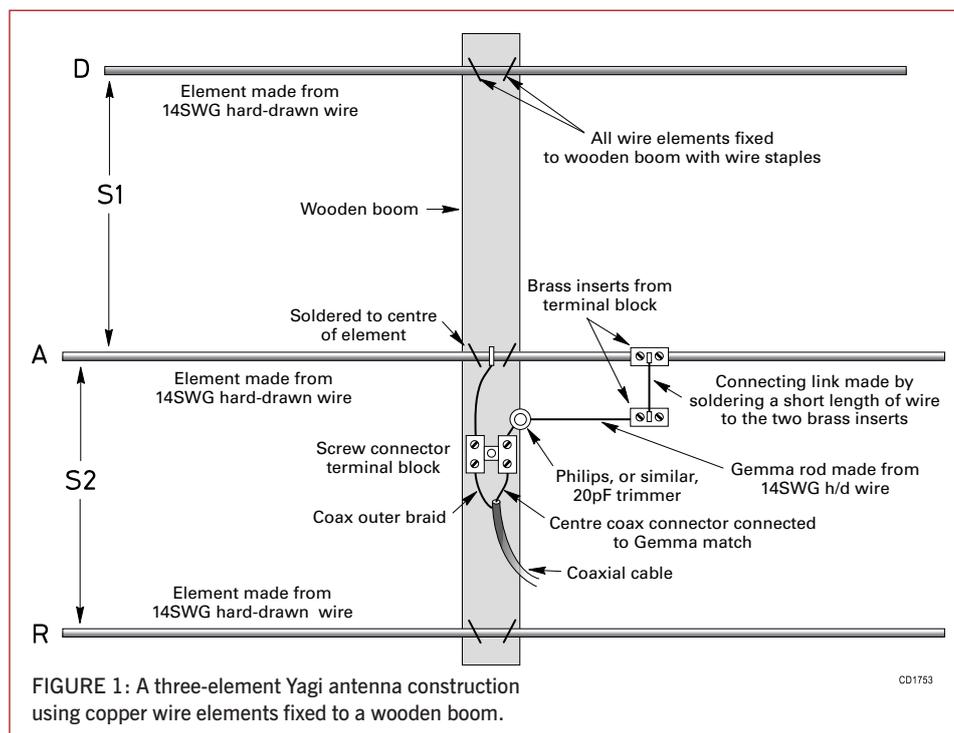


FIGURE 1: A three-element Yagi antenna construction using copper wire elements fixed to a wooden boom.



PHOTO 2: The latest edition of my 145MHz three-element Yagi with the elements made from 10SWG (3.2mm) enamelled wire.



PHOTO 3: Setup for adjusting the antenna gamma match using the MFJ-269.

on the grass below the table. Environment can play a part in the performance of a high Q antenna such as a Yagi. When such an antenna is located in a loft location its position relative to any electromagnetic obstructions such as electrical wiring has to be considered.

My advice would be to make all measurements in an open space with the antenna three quarters of a wavelength high. When you install it in the loft space, note if there are any changes from the 'open space' measurement settings.

While in the open space testing phase it is a good idea to check the directivity, which can be done using the S-meter of a transceiver tuned to a local repeater. By holding the antenna by the boom at the reflector end, vertically polarised, you should be able to locate the position of the repeater. Then repeat with the antenna in the opposite direction. There should be a difference of at least 4 S-points in the two readings if the antenna is working properly.

CURRENT CHOKES. Let's return to the common mode problem reported by G8PJC. As you know, one method of making a current choke to minimise common mode effects is just to roll the feeder into a coil near to the antenna feed point. During an exchange of e-mails I received the following:

"As you can see from the attached photo (Photo 1) I am now using just three turns of coax as a current choke balun. I was able to achieve a SWR of 1.1:1 measured at the transceiver end of 6m of RG58 C/U but slight common mode effects are still observed when the coax is moved about at the transceiver end. To achieve a low SWR I noted that the choke needed to be at 90° to the plane of the antenna and the coax down lead must not be a vertical drop. Also I noted that making the coax coil a bit more symmetrical improved the SWR."

I made a similar current choke balun to the one described by G8PJC, although my model might have been slightly smaller, having a diameter of around 100mm. The measured resonant frequency was



PHOTO 4: A 145MHz current mode choke made simply by winding just over two turns of RG8 Super on a short length of 35mm plastic waste pipe.

94MHz, where its impedance was well over 1000Ω, see **Figure 3**. At 145MHz the impedance was down to just over 300Ω and, as you might expect, was rather reactive.

The resonant frequency of this type of choke arrangement is fairly sharp and not just any coil of coax will do. I tried various coils of coax during my attempt to make an effective VHF coax choke. I found that just over two turns of RG8 Super wound on a short length of 35mm plastic waste pipe, illustrated in **Photo 4**, gave a suitable characteristic. Although not quite on resonance, its impedance at 145MHz is well over 1000Ω. The characteristics of this choke can be seen in **Figure 4**.

GAMMA MATCH. As you can see from Figure 1 and Photo 3 I use a gamma match to transform the feeder impedance to the driven element impedance. G8PJC is of the opinion that the gamma match creates a significant contribution to common mode currents on the feeder. I know the gamma match is not popular with everyone; the rather asymmetrical layout of the matching system gives the impression of an asymmetrical current distribution on the driven element. The opposite side of the element to the feed point is a counterpoise and the currents should be equal – provided that some of the current on the counterpoise side is not travelling down the outside braid of the coax as common mode current.

The obvious disadvantage of the gamma match in most VHF and HF permanent Yagi antenna structures is the small adjustable

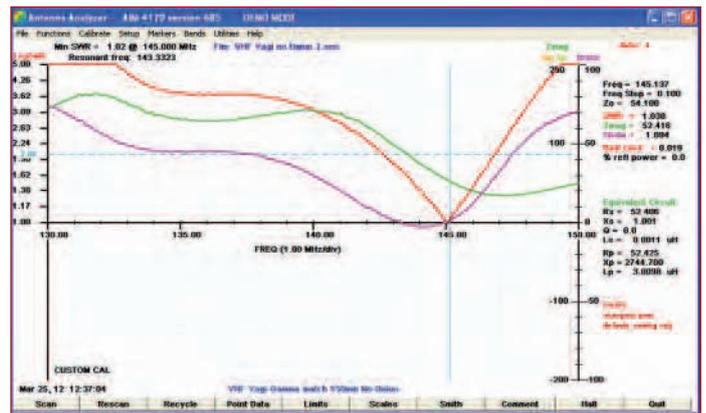


FIGURE 2: The frequency/matching characteristics of the three-element Yagi measured using the AIM 4170. SWR is shown by the light red trace while the green and purple traces indicate impedance (polar form).

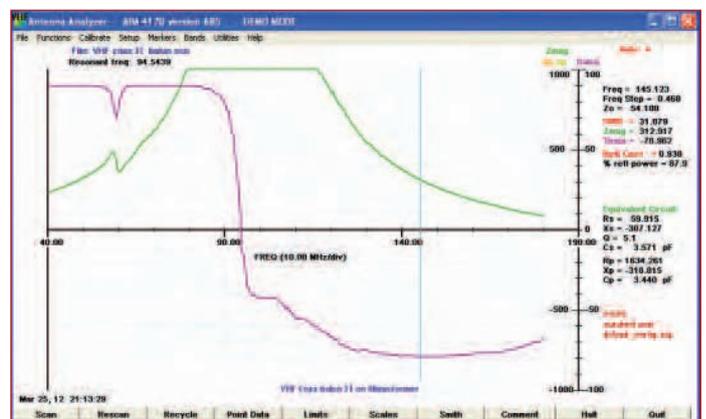


FIGURE 3: Frequency characteristics of 3 turns of RG8 Super wound into a 100mm diameter coil. The resonant frequency is near to 94MHz.

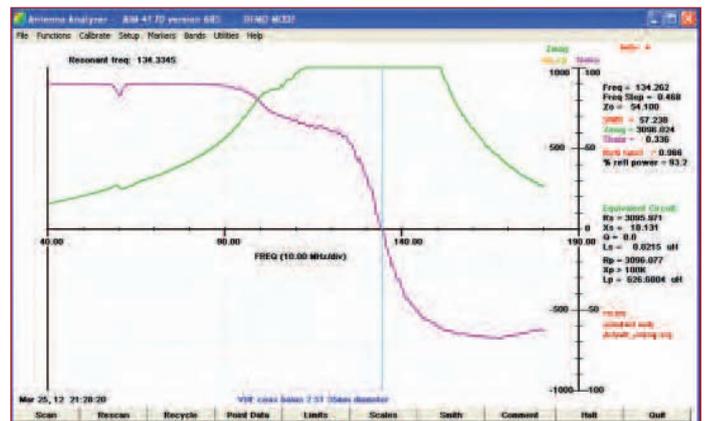


FIGURE 4: Frequency characteristics of the current choke shown in Photo 4. Although not quite on resonance at 145MHz, its impedance is well over 1000Ω.

capacitor, usually housed in a nearby plastic box where it is difficult (if not impossible) to protect it from the ingress of water.

A more practical approach is to adjust the gamma rod to the correct length and the capacitor to the right value for the correct match. The variable capacitor can then be replaced with a good quality fixed one. This gives a much more weatherproof arrangement without having to build a special weatherproof box for the capacitor. You might have to make up the fixed capacitor with several in parallel to get the desired value.



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The Lagan Valley ARS station in VHF NFD 2011.

LOW POWER WINNERS. To promote VHF NFD I asked Victor, G14LKG of Lagan Valley ARS to write an item about how they won the Low Power section last year. I swear I had no idea of what I was letting myself in for! As Victor himself puts it, "There is a tradition in the Lagan Valley ARS that, once per year, on the Wednesday before VHF NFD, a few members of the club take a few minutes from a club night to discuss the arrangements for this contest. A sked is then set up on 2m SSB for the next night, to test the transceiver, keyer, voice keyer and laptop. It is considered that the antennas do not require testing, as they worked the previous year and have sat in a pile without moving ever since. We have found that careful planning like this rarely fails us. The Friday evening is left to test the batch of beer that is being taken to the site. You can never be too careful. Finally, on Saturday, wives are instructed what sandwiches to make. When this fails, fry-up ingredients are purchased and, if there is room, put in the cool box with the beer.

"This contest is a team effort, with various members having their duties to carry out, bringing with them vans, antennas, generator and our beloved 'roll-a-long'. This is a sort of horse box for hams, only not as clean. It takes about an hour for it to be towed to the site in the Dromara Hills, a beautiful location with

stunning views looking across the Mourne Mountains, the Isle of Man and up to Scotland. It is in this 'ham box' that we operate 2m and have a gas ring to make tea and fry everything else. As **Photo 1** shows, the 2m Yagi is braced against this box and kept vertical with ropes. The 'armstrong' method is used to turn it. 6m and 4m are operated from a van a short distance away, with the antennas for this mounted on a small trailer tower. This sometimes causes interference, but normally not too bad. Quick tests of the stations are carried out. This is where the intense preparation pays off, with the stations working first time. A quick snack is eaten and maybe a little tinnie sipped. It should be pointed out the same person's beer is drunk at this time every year, but names will not be mentioned as it will show up those who are too miserable to get their own.

"With fewer people taking part in recent years it was decided to enter the Low Power section, reducing the number of people required to set up and run the stations, an unfortunate reality these days. A sure way of knowing if lack of numbers or increased age is affecting your Field Day is to count the empty cans the next morning. If there's less than a bin bag, it's affecting you.

"As the evening progresses a few people may turn up, normally phoning ahead to check the order for the Chinese and the

beer holding. In 2011 a bloke with a gun turned up, though we were relieved to find out he was hunting rabbits, not geeks.

"Most years about four people camp over at the site, while others who live close by and look after numero uno go home to a warm bed. In 2011, due to illness, only two stayed over, in separate cars. Things kick-in early the next morning, with the 6m antenna being switched for the 4m Yagi and then the remaining food being fried. As the morning goes on those that slept in cosy beds finally arrive at the site and operators are swapped to give everyone a play and a chance to be part of the 2011 winning team.

"As is tradition, at the end of the contest, things are packed up as quickly as humanly possible, with the antennas being lowered and the rest grabbing their respective kit and running. To see this well-oiled human machine in action is truly awe inspiring. Ed is then left to tow our beloved roll-a-long home behind his John Deere 6400 tractor off the hill at 10mph." What I see as the moral of this story is that even with a small team you can do well and have fun in the process. Good luck to all the teams taking part in VHF NFD this month.

SUCCESS BREEDS SUCCESS. In February I included an item in which I asked for a member of a club that until fairly recently didn't enter contests, but now does, to tell us "how you (or your club's contest manager) approached the subject of persuading members to support a club effort, either in a multi-operator event such as a Field Day or in a team event such as 80m Club Championships." Malcolm Prestwood, G3PDH responded from a club that has become highly successful in the 80m Club Championships – Norfolk ARC.

He says "Norfolk ARC has existed for many years and after dropping back to some 40 members in the late 90s has now built up to a membership of around 150. The club is an extremely active club overall, not only contests, but with weekly meetings, a special 'Bright Sparks' section for youngsters plus a wide range of amateur radio activities. We undertake special event stations, most of the RSGB club orientated HF contests, visits, speakers, DF hunts, construction projects, club radio station, training from Foundation through to Advanced, table top sales, and many other things. An underlying theme is

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Jul 2	80m Club Championships	1900-2030	CW	3.5	RST + SN
Jul 11	80m Club Championships	1900-2030	SSB	3.5	RS + SN
Jul 19	80m Club Championships	1900-2030	Data	3.5	RST + SN
Jul 22	Low Power Contest	0900-1600	CW	3.5-7	RST + SN + power
Jul 28-29	IOTA Contest *	1200-1200	CW/SSB	3.5-28	RS(T) + SN + IOTA ref

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Jul 3	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Jul 7-8	VHF NFD	1400-1400	All	50-1296	RS(T) + SN + Locator
Jul 8	144MHz Backpackers #3	1100-1500	All	144	RS(T) + SN + Locator
Jul 10	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Jul 17	UHF UKAC	1900-2130	All	1.3	RS(T) + SN + Locator
Jul 22	70MHz Trophy +	1000-1600	All	70	RS(T) + SN + Locator + Postcode
Jul 24	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Jul 23	SHF UKAC	1900-2130	All	2.3 & up	RS(T) + SN + Locator
Jul 31	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)
Jul 1	WAB Low Power 2m Phone	1000-1400	All	144	RS(T) + SN + WAB square
Jul 14-15	IARU HF Championship	1200-1200	CW, SSB	1.8-28	RS(T) + ITU zone (UK=27)

Italics indicate that only provisional information was available.

*HF Championship event. +VHF Championship event. §Super League event.

For all the latest RSGB contest information and results, visit www.rsgbcc.org

the promotion of the hobby to youngsters and the development of newcomers.

"To this end we have also extended this to contesting. Through a small group of existing testers we have managed to build up the interest in contest participation to a group of 35 club members, whose skills vary widely. This has been achieved through giving dedicated talks on contesting and how it can be of benefit to their overall operating skills and station performance. We created a formal contesting sub group and then continued with contest workshops using AV presentations, along with a simulated station (complete with interfacing and contest software). Workshops have covered the basics for beginners through to more technical matters on interfacing and software setup, including station ergonomics and operating techniques. We also conduct GB2CW Morse lessons three times a week, to help those newbies learn Morse or improve their existing Morse.

"There has always been a strong element of keeping it simple for the newcomers, to get them started, as it can be the plethora of complexity which can put them off from day one. This has also extended to helping people get set up at their own station, so we also hold a 'contest net night' every week for people to come up on 2m to ask about problems and configuration issues which we are often able to diagnose and solve over the air. In particular we have concentrated on getting people started on data, which can be daunting to some. We have a good team spirit within the group and it is all about maintaining interest and involvement."

So there you have it, if the desire to contest doesn't occur naturally in the blood, it can be instilled and fostered as 'part of the package'.

The critical factor though is that it takes a go-ahead, energetic club such as Norfolk to do it. Clearly they have recognised the need to do a lot more than just train people and get them through exams, only to then leave them in the lurch. The latter is something I have seen time and time again, but the lads and lasses at Norfolk ARC have clearly got the formula right and the result is success.

THIS MONTH'S EVENTS. July is the final month of the 80m Club Championships and we begin with the CW session on the 2nd. It is followed by the SSB session on the 11th and the datamodes session on the 19th. Sunday 22nd sees the Low Power Contest taking place, which I think is the only RSGB contest with a lunch break. There are two power categories, 10W and 3W, and sections for fixed and portable stations. That makes four categories and a trophy is awarded to the winner of each. The biggest HF event of the month will undoubtedly be the IOTA Contest. There are 12-hour and 24-hour categories. The IOTA Reference is part of the exchange, the one for mainland Britain being EU-005 and mainland Ireland being EU-115. Offshore islands have different references. All the European references can be found on the Internet at: www.logiciel.co.uk/iota/shtlist/europe.html and you can read more about the event in G3XTT's feature elsewhere in this edition of *RadCom*.

The first VHF event of the month is the 2m UKAC on the 3rd. VHF NFD takes place over the weekend of 7/8th. At one time there was only one section in VHF NFD, but over the years the number has gradually increased. These days there are six sections, including two for single-ops who stay at home and

'sweep' the bands looking for the portable entrants. The number of teams (sweepers excluded) entering is almost the same now as it was 15 years ago, which is the earliest date of the results on the CC website. On Sunday 8th the third leg of the 144MHz Backpackers Contest takes place. Most of it overlaps the final part of VHF NFD, but it continues for one hour after VHF NFD ends. The maximum power in this is 3 watts. After that we return to the UKACs, with 70cm on the 10th and 23cm on the 17th. The 70MHz Trophy Contest on Sunday 22nd is one that has increased in popularity, especially now that more countries have access to the band. Last year there was a record entry of 45 stations. The remainder of the month is the domain of the UKACs, with 6m and SHF on the 23rd, and – because it's a five Tuesday month – 4m on the 31st.

I only have a couple of other events to highlight this month. The first is the WAB 2m Low Power Phone Contest on Sunday 1st. The maximum permitted power is 10 watts and there are sections for single-op fixed, mobile and portable, and multi-op portable. Last year's results suggest there is a very good chance of anyone entering being a winner, because there was only one entry! The IARU HF Championship that runs for 24 hours on 14-15th will be a busy affair. The UK HQ station GR2HQ will be active and looking for as many QSOs as possible on as many (HF contesting) bands and modes as possible with as many people as possible. This includes UK stations. As in previous years, there are awards for individuals and clubs who work it (see the rules on www.gr2hq.com).

ARDF

British ARDF Championships 2012



RSGB President Dave Wilson, MOOBW pictured with the competitors from overseas who travelled to this year's British ARDF Championships. From left to right: Richard, F/SWL, Patrice, F8AZG, Wolf-Dietrich, DK7TD, Sarke, OK/SWL, Dave Wilson, MOOBW, Hristian, LZ/SWL, Panayot, LZ1US and IARU Region 1 Executive member, Svetoslav, LZ/SWL, Anke, DL9OCA, Lars, SM00Y, Marc, ON6HI, Wilfried, ON6IN and 'PA' SM0BGU.

CHAMPIONSHIPS. The 2012 Championships took place in a new part of England in May of this year. The area used was Cannock Chase, located between Cannock, Stafford and Lichfield. Our Championships attracted a number of visitors from the Continent, as is usually the case, and they enjoyed a welcome break in the wet and cold weather conditions we endured during April and May. A sunny weekend with no rain and modest temperatures were perfect conditions for racing around a beautiful forest hunting down hidden transmitters.

The 80m race was staged on the first day and planner Andrew, G4KWQ made full use of the mapped area that extended to about 12 square km, located on the eastern side of the extensive Cannock Forest. The generally smaller wooded areas in Great

Britain make it quite rare for the ARDF enthusiasts to enjoy start and finish at different locations and to be able to use the full IARU rules in regard to the minimum distance from the start to any of the transmitters.

Cannock Chase is far from being flat and the 80m course took competitors down the huge eastward facing re-entrant, before turning back along the ridge on the north side to the finish – that is if the competitor decided to visit the hidden transmitters in the optimum sequence.



Andrew G4KWQ, receives the 144MHz plate from RSGB President Dave Wilson.

David, M3WDD, planner of the 2m race on day 2, was very kind to the competitors in siting his start at the top of a hill with panoramic views across the whole of the forest. The competitors eagerly used this generosity of spirit to get some excellent, reflection free bearings of the VHF transmitters set out in the forest below them. They then charged down the hill and off into the trees, in search of their assigned transmitters.

The overall champions are decided from across the five men's age classes and three women's age classes on the fastest time from any class. Older competitors have to locate fewer transmitters and this helps to even out the playing field. It was in fact the two planners who triumphed, with David, M3WDD, running in M50 (men aged 50-59) winning the 80m competition and Andrew, G4KWQ in M40 who found all five transmitters and powered round in a blistering 67 minutes to take the 2m title. This was 15 minutes ahead of anyone else and won Andy the 144MHz Plate. The leading overseas competitor on both days was Wolf-Dieter Barth from Germany.

RSGB President Dave Wilson, MOOBW, very kindly came to present the trophies, prizes and certificates and this rounded off a most enjoyable weekend of radio sport.



Sarke Jelinkova of the Czech Republic 'punching' at one of the 2m transmitters to register that she has located the transmitter and to record her split time.

ARDF EVENTS IN JUNE AND JULY

Sunday 24 June

ARDF for children day at Bracknell
(details on page 74 of May *RadCom*)

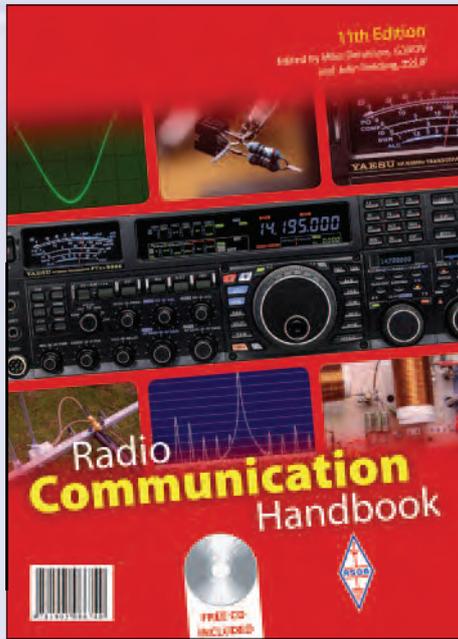
Saturday 30 June

Oldham, Lancashire

Sunday 22 July

Maulden Woods, Bedfordshire

See www.rsgb.org.uk/radiosport/ardf/events for details



RSGB Radio Communication Handbook

11th edition

Edited by Mike Dennison, G3XDV
and John Fielding, ZS5JF

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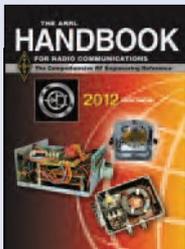
Size 297x210mm, 864 pages,
ISBN: 9781-9050-8674-0

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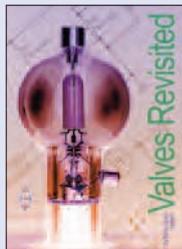
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Valves Revisited



Bengt Grahn, SM0YZI

A fascinating guide to the world of thermionics

For over half a century, valves (or tubes) dominated electronics. They could be found in public address systems and hearing aids, televisions and computers, communications and medical equipment, and of course in the radio set in every home. Since the advent of the transistor and the silicon chip, valves have almost completely disappeared. However, valves are still the preferred device in specialist applications, usually involving high power.

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Size 174x240mm, 272 pages,
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Computers in Amateur Radio



Steve White, G3ZVW

There is much that can be done with a computer and many are simply not aware of the huge potential they offer. *Computers in Amateur Radio* sets out to provide an insight into the wide range of amateur radio uses for the humble home computer.

Computers in Amateur Radio is intended to provide a practical guide to a wide range of amateur radio topics. Readers will find chapters dedicated to Software defined radio (SDR) alongside the more well understood topics such as Datamodes. You will also find chapters dedicated computer modelling for Antennas, Propagation and even Terrain for HF. There is much besides this to with Internet linking and a whole host of other internet activities covered.

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Technical books

Test Equipment for the Radio Amateur

Clive Smith, GM4FZH

Many of us would like to analyse the performance of our stations but find that professional test equipment such as spectrum analysers prohibitively expensive. Yet it is can be easy to make many pieces of very useful test equipment yourself at home.

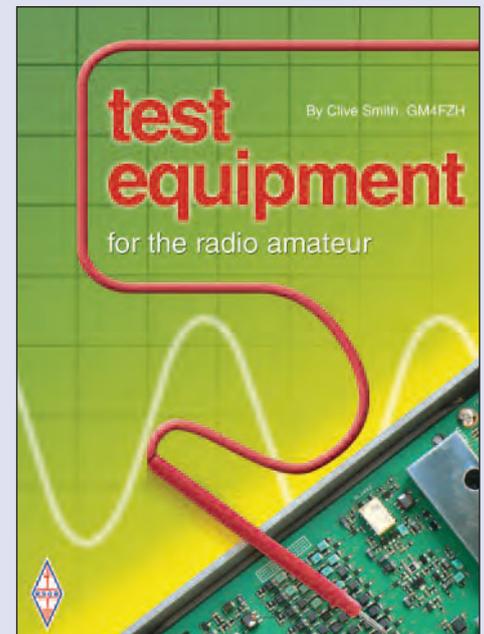
This fourth edition of *Test Equipment for the Radio Amateur* has been fully updated to show what can be achieved today with the simple, inexpensive and easily obtainable. Test equipment for measuring current, voltage, the value of components, frequencies, receiver performance, RF power, modulation, antennas and transmission lines, noise, transmitter linearity and much more is all covered. One chapter covers software based test equipment that runs on a PC and includes specialist calculators, oscilloscope and spectrum analyser programs, signal generators, SINAD analysis and even design

tools for RF filters. Frequency counters and oscilloscopes, which previously would have been beyond the means of most of us but has become relatively cheap in recent years is well documented. There is an appendix of useful reference data with everything from resistor colour coding to discrete semiconductor coding and surface mount device identification to common coaxial cable equivalents. There is even a second appendix of PCB and component layout diagrams for many of these projects.

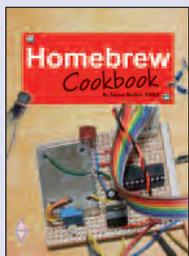
If you are at all interested in what makes your radio tick as either keen 'home-brewer' or a 'black box' operator *Test Equipment for the Radio Amateur* is the must have for your book shelf!

Size 174x240mm, 256 pages,
ISBN: 9781 9050 8672 6

Non Member's Price £14.99
RSGB Member's Price £12.74



Homebrew Cookbook



Eamon Skelton, EI9GQ

Homebrew Cookbook starts with the very basics of homebrew and progresses to advanced topics. There are construction methods that take you right through all the main techniques from dead-bug layouts through to dedicated printed circuit designs.

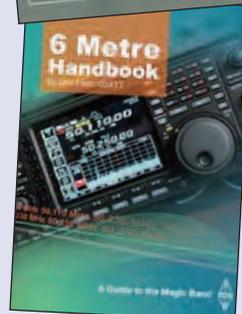
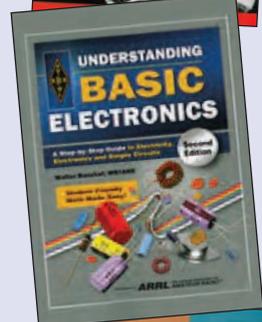
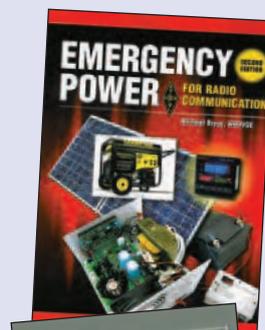
Projects start with receiver designs and a simple direct conversion receiver, followed by a more sophisticated superhet receiver. *Homebrew Cookbook* also includes an SSB transmitter, PA and a VHF transverter. All the designs are modular, making it very easy to extract sections for other uses and adapt the designs to suit your needs. Where test equipment is required Eamon has simple circuits on hand to allow you to build your own rather than have to buy commercial equipment. Through the book is an adherence to homebrew principles as all projects use simple construction techniques with cheap, readily obtainable, components.

The Homebrew Cookbook is an edited, updated book of Eamon's writings from the pages of RadCom and a fantastic reference. *Homebrew Cookbook* will have you itching to dust off the soldering iron and start construction.

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HF F-Layer Propagation Predictions for July 2012

Compiled by Gwyn Williams, G4FKH

Time (UTC)	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe	77	74	3688	87.3	37888	47777777885	67777688	6
Moscow								
*** Asia								
Yakutsk								
Tokyo								
Singapore	23	788	788	675	366	5		
Hyderabad		255	2666	5665	455			
Tel Aviv	899	98	7999	76	6887	5675		
*** Oceania								
Wellington								
Well (ZL) (LP)		6	6	34	34	54	56	
Perth		2	35.5	4				
Sydney		37	67	34				
Melbourne (LP)		99	8998	7	9998	59	8.8	79
Honolulu							44	
Honolulu (LP)							4544	
W. Samoa								
*** Africa								
Mauritius	22	4887	3	8887	3887	53		
Johannesburg		23	776	74	6	4		
Ibadan	1	65	556	277	5.6	6787	76	5675
Nairobi	2	33	888	6	666	6666	4566	5
Canary Isles	65	166	885	788	8873	6888	8785	8888
*** S. America								
Buenos Aires		2	888	68	767	78	4	476
Rio de Janeiro		6	986	89	76	788	5	777
Lima		2	888	58	7665	78		
Caracas		3	8872	68	8787	488	5.564	5688
*** N. America								
Guatemala		33	887	7	756	7		46
New Orleans		65	775	5	756	46		
Washington	2	66	886	37	864.3	478		564
Quebec	5	76	774	68	35676			
Anchorage		7	33	68	77655556667	655	667777	6
Vancouver								46
San Francisco								
San Fran (LP)								

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, **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 July, August & September are respectively (SIDC classical method – Waldmeier's standard 68, 70 & 72 and (combined method) 83, 85 & 87. The provisional mean sunspot number for May was 69.0. The daily maximum / minimum numbers were 98 on 16 May and 52 on 30 May.

RadCom

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FT-950	£1,259.95
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X-700H	£274.95	BU-50	£34.95
X-5000	£139.95	V-2000	£124.95
X-7000	£245.95	GSV-3000	£194.95
W-735	£94.95	GZV-4000	£199.95

Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, e-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. Please note that we don't normally print 'closed', 'TBA' or 'every Tuesday' type submissions. The deadline for the August 2012 RadCom is 2 July and for the September edition it's 30 July. For GB2RS, the deadline is 10am on the Thursday for the week of broadcast. If you need to amend your club details, please visit www.rsgb.org/clubupdates.

INTERNATIONAL

No listings received.

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GMOONX, RM1@RSGB.ORG.UK

COCKENZIE & PORT SETON ARC

Bob, GM4UYZ,
01875 811 723,
www.cpsarc.com
7 VHF Field Day
28 Weekend event.
RSGB IOTA Contest
from the island of Tiree

LIVINGSTON & DARS

Norman, GM1CNH,
07740 946 192,
uk.groups.yahoo/group/msOliv
3 Operating evening
10, 24, 31 Club evening
17 Morse code practice

WEST OF SCOTLAND ARS

Sam, GM4BGS,
07771 554 035
6, 20 Club night
13 Mototrobo TNG, GM4BGS
27 Raspberry PI, MMOYEQ

Scott Caldwell, MM6SWC is the youngest member of Glasgow and Clyde RAYNET Group. Scott passed his Foundation licence earlier this year and attends many RAYNET events and exercises with his uncle, Alan, 2MOTXY. He has a keen interest in amateur radio and looks forward to progressing to Intermediate and Advanced. Scott is supervised during all RAYNET activities but is active on all radio nets and is rapidly becoming a competent radio operator.



REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

GLENROTHES & DRC

Laurie, MMOLJA mm0ljasecgc@btinternet.com
18 Visit to The Museum of Communications, Burntisland, 2pm

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

BOLTON WIRELESS CLUB

boltonwireless@gmail.com
9 Club meeting
23 The work of the RNLI,
Derek, G7LFC

SOUTH MANCHESTER R&CC

Ron, G3SVW, 01619 693 999
5 Home Contraction -
Metal Work, Ged, G8RSI
12 Secret War DVD
19 Homebrew show and tell

26 PC clinic, Dave, G4UGM
30 Monthly technical forum

STOCKPORT RS

Nigel Roscoe, 07973 312 699,
info@g8srs.co.uk

3 Introduction to digital
voice on HF & commercial
DRM reception, Alex
Emmerson, M3ASQ
17 Aerials for the 'urbanight',
Tom, M0DCG

Bolton Wireless Club had another three candidates successfully pass the Foundation exam. Now armed with their new callsigns, the club looks forward to hearing them on the air.

From the left they are; Stephen Fiske, M6BRP, Derek Cotton, M6BRM and Mark Rawson, M6OSX.



REGION 4: NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, GOUGE, RM4@RSGB.ORG.UK

DENBY DALE RC

Richard, MORBG,
07976 220 126,
m0rbg@talktalk.net
4 Visit to Asiatic Russia
Part II, Andy, MOGGR
11, 25 Club net, 1930,
145.575MHz ±
18 Club night

OTLEY ARS

Paul, 2E0PAK,
07768 996,370,
m0pkw@otleyradio.org
3 144MHz UKAC Contest
+ Morse class
10 Morse class, antenna
refurbishment
+ night on the air
14 Weekend event: IARU HF
World Championship Contest
17 Morse class + technical topics
24 50MHz UKAC Contest
+ Morse class
31 Night on the air + Morse class

RIPON & DARS

Rob Hall, MORBY,
07876 085 631,
www.ripon.org.uk
5 On the air

SHEFFIELD ARC

Peter Day, G3PHO,
sarc@g3pho.org.uk
2 Social evening & RSGB
80m Contest (CW) from
club station G3RCM
7 Weekend event: RSGB
VHF National Field Day,
club active as G2AS/P
9 BBQ & QRP portable
evening on club fields
(& surrounding hills)
11 RSGB 80m Contest (SSB)
from club station G3RCM
16 Annual fox hunt
19 RSGB 80m Contest (DATA)
from club station G3RCM
23 Grand summer junk sale

28 Weekend event: IOTA Contest,
Club active as M3M OR MM3M

WAKEFIELD & DRS

Ken G8FSO, g8fso@wdrs.org.uk,
07 900 563 117
5 HF propagation, Dave, G0EVA
7, 16, 23, 28 Intermediate
and Advanced courses
continue from 1330
12 Kenwood TS-2000X talk
and demo, Phil, 2E0GBF
19 Committee meeting
and on the air
26 BBQ at HQ

Wakefield & District Radio Society has had a change in training personnel. The new contact is Bill Catney, 2E0IPC and he can be reached by e-mail to 2e0ipc@wdrs.org.uk.

Burnley & District ARC concluded their latest Intermediate course with a successful examination in March and all eight candidates achieved a pass. The photograph shows left to right (back row): Ron Whalley, M6RWP now 2E0RWB, Craig Bradley, M3BEQ now 2E0VRX, Marc Patrick, M3VSD now 2E0DXM, Eddie Cross, M6AZH now 2E0EAW and Barry Cunningham, M6NUC now 2E0CKT. Front row: Tony Hickey, M6HKY now 2E0CKS, Bob Foote, G4GQP (course instructor), Ayub Malik, M6AYB now 2E0HAQ and Shane Lofthouse, M3NWK now 2E0RCI.



REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, M0VRR, RM5@RSGB.ORG.UK

ALDRIDGE & BARR BEACON ARC

Albert, G0KFS, 01922 614 169
2 CW tuition & general discussion
16 Use of meters & ATUs

GLOUCESTER AR&ES

Anne, 2E1GKY, 01452 548 478, daytime,
www.g4aym.org.uk
2 A bargain basement approach to SDR, Steve, G4HFT
9 DF hunt
16 Newcomers night/informal
23 Visit to Courtyard Books/Draw, by kind permission of Brian, G4CIB

MIDLAND ARS**Norman, G8BHE, 07808 078 003**

- 4 General meeting, shack on the air and training classes
- 11 Committee meeting and training classes
- 18 BBQ and other refreshments plus training classes
- 25 Open meeting, shack on the air and training classes

SOUTH BIRMINGHAM RS**Don, 01214 581 603,****www.radioclubs.net/southbirmingham**

- 2 Final Field Day plans
- 4 Talk in main hall
- 5 Aerial testing and cables
- 6 Loading trailer in car park
- 7 VHF Field Day, helpers welcome
- 9 Unloading trailer, debrief, estimated scores & position
- 12, 19 No training classes, revising in case of resits
- 13, 20, 27 Shack and aerial work
- 16 Committee meeting
- 23 Repairs to Strumech tower and cleaning
- 30 Social event outside, possible BBQ

STRATFORD UPON AVON DRS**GOCHO, 01608 664 488,****cousbey@theiet.org**

- 9 BBQ & on the air
- 23 Construction competition

TELFORD & DARS**Mike, G3JKX, 01952 299 677, mjstreetg3jx@blueyonder.co.uk**

- 4 Committee meeting, GX3ZME OTA HF/2m
- 7 Weekend event: VHF NFD, Long Mynd, arrive 1030 please
- 11 BBQ, Derek cooking, all welcome
- 18 NFD debriefing
- 25 Wooferton SW radio transmitting station visit

WORCESTER RAA**Rich Moles, MOUVA, secretary@m0zoo.co.uk**

- 3 Club net, 7.30pm, 145.350MHz FM
- 10 Talk / presentation

WYTHALL RADIO CLUB**Chris, GOEYO, 07710 412,819**

- 1, 8, 15, 22, 29 Club net on 145.225MHz
- 3 Final preparation for VHF NFD
- 7 Weekend event: VHF NFD in Wythall Park
- 10 Committee meeting in the shack
- 17, 31 Free 'n' easy evening
- 23 Curry night at Monsoon, Wythall
- 24 Internet night in the shack led by G7DDN

In May, Carmarthen RAS was involved with the radio communication for the annual Carmarthen Mayors Race. Later in the month four students passed their Foundation exam. The photo shows Tony Cooper, Lyndon Price, Sue Beer and Adrian Lau. Their instructor

was Trevor Nicholas, GW4RVA.

**REGION 6: NORTH WALES**

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

DRAGON ARC**Stewart Rolfe, GW0ETF, 07833 620 733**

- 2 Talk on an audio synthesiser project, Les Hayward, MW0SEC
- 16 IOTA contest planning

WREXHAM ARS**Carl Morris, MW0TBB, tydraig@wrexham-ars.co.uk**

- 3 Quiz night
- 17 Junk sale

REGION 7: SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, RM7@RSGB.ORG.UK

ABERYSTWYTH & DARS**Ray, GW7AGG, 01970 611 853, ray@clocktower.go-plus.net**

- 26 Club net on 145.500 then 145.550MHz

CARMARTHAN ARS**Lloyd, 2WOLLT, 01239 711 297, 2WOLLT@talktalk.net**

- 3 Rig check by GW4RVA
- 17 Open night

REGION 8: NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, RM8@RSGB.ORG.UK

No listings received.

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

BROMLEY & DARS**Andy, G4WGZ, 01689 878 089**

- 17 New amateurs operating by G8MNY & G8ITB

BURNHAM BEECHES RC**Dave, G4XDU, 01628 625 720**

- 2 Getting ready for the McMichael Rally
- 16 Club VHF contest

COULSDON ATS**Steve Beal G3WZK, secretary@catsradio.org**

- 9 Natter night

CRAY VALLEY RS**Malcolm Bryan, G8MCA, 07906 433 965**

- 5 Club meeting
- 19 Plans and final operating arrangements for the 2012L Olympic special event station, Bob, M0MCMV

CRYSTAL PALACE R&EC**Bob, G300U, 01737 552 170, g300u@aol.com**

- 6 bhi DSP Noise Cancellation, Graham Somerville, M0ZGS

DORKING & DRS**Garth, G3NPC, 01737 359 472, www.ddrs.org.uk**

- 24 Transmitting from the Devil's Dyke

EDGWARE & DRS**Mike, G4RNW, 02089 500 658, michael.stewart5@ntlworld.com**

- 12 Why you like amateur radio and what brought you into the hobby
- 26 On the air, equipment by Eddie, M0HIE

HOME COUNTIES ATV GROUP**Pete, G8FRC, 01189 695,697, www.gb3hv.com**

- 24 Club meeting

NEWBURY & DARS**Rob, G4LMW, 01635 862,737, g4lmw@btconnect.com**

- 22 Low power contest
- 28 IOTA

RADIO SOCIETY OF HARROW**Linda, G7RJL, 02083 868 586, www.g3efx.org.uk**

- 13 Smartphone ham S/W, M0SFX
- 17 Social, Rayners Lane

- 22 CQ GX3EFX/P, Old Redding
- 25 WAB Torch, GX4WAB
- 27 Summer activity

READING & DARC**Pete, G8FRC, 01189 695 697**

- 12 Super-fast processors, Des Howlett, G8FIF
- 15 McMichael Radio Rally, Reading Rugby Club, Sonning

SHEFFORD & DARS**John Burnett, M6JBU, 07860 804 793**

- 5 Visit to Anglian Water Leighton Linlade Treatment Facility
- 7 VHF National Field Day
- 12 2m fox hunt – foxes are Terry, G4OXD & Peter, M0CKA
- 19 Visit to the National Radio Centre, Bletchley Park
- 26 BBQ, Barry's field

SOUTHGATE ARC**David Sharp, M0XDS, david.sharp1@tesco.net**

- 11 Radio on the air in the Spinney

SURREY RADIO CONTACT CLUB**John, G3MCX, 020 8688 3322, secretary@g3src.org.uk**

- 2 Club BBQ

SUTTON & CHEAM RS**Darren, M0PRV, 07525 753 702, info@scrs.org.uk**

- 19 Early TV receivers, Stephen Niechcial

VERULAM ARC**Ralph, G1BSZ, 01923 265 572, g1bsz@aol.com**

- 12 Social with GB3VH repeater group 7.30pm, Rose and Crown, Sandridge
- 17 Talks: Alison G8ROG on latest RSGB developments, Larry G4OXY on his 4m/6m J pole project

WEY VALLEY ARG**www.veyvalleyarg.org.uk**

- 6 AGM
- 21 Introduction to datamodes, Andrew Vine, M0GJH

WIMBLEDON & DARS**Andrew Maish G4ADM, 020 8335 3434**

- 13 On the air with the TS870
- 27 Start of annual camp

Reading and District Amateur Radio Club has had more success when all 6 candidates in the May Intermediate exam course passed. From left to right, Muhammed, M6BQZ, John, M6BPQ, James, M6JMO, Roger, M6LAR, James, M6LTK and Steve, M6PEP. The course was run over two Saturdays and two evenings. John will be taking his Advanced exam within days and the club wishes him success. Please check the website for future courses www.radarc.org.



DXing for the busy person was the title for Alan Gray, G4DJX's talk to **Verulam ARC** at its club meeting in May. Alan described the techniques required for being successful at DXing. So far he has made contacts with 320 DXCC entities, there being currently 340. Alan fits this around the busy duties of Head Teacher of a local secondary school in St. Albans. The Verulam club runs courses at the school and many of their students have obtained their licences as a result. Alan, G4DJX is a long-time member of the Verulam ARC.



RS of Harrow reports another successful Foundation course in May with five students passing with flying colours. The Society congratulates them all and looks



REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

BREDE STEAM ARS

Steve, 01424 720 815, M0NUC@aol.com

3, 7, 10, 24, 31 At the shack

18 Olympic torch day operating GX4WAB at the shack, BBQ in evening

FORT PURBROOK ARC

Mick Ponsford, M0GWD, 02392 366 699

27 Natter night

forward to hear them on the air. In the photo you can see Prakash, Carl, Jim, M0UJC, Malcolm and Chris. RSH thanks its volunteer Exam Team and Vince, G7LWN (GSL-17th Harrow Scouts) making this all possible, for the use of their premises as an exam centre.



At a recent meeting of **Edgware & DRS**, Eddie, M0HIE was named as this year's winner of the annual constructor's

cup. The winning item that he is showing is an antenna matching switch that allows him to switch between various antennas and to include a choke balun as required. The switching is done with relays and the selection is indicated by LEDs.

Spacecraft engineers from the leading European satellite construction company, Astrium, together with scientists from Middlesex University Robotics Department shared a weekend with Verulam ARC in April to obtain their Foundation licences. This proved very stimulating as ideas and techniques were shared between the three groups. Ashley Cook, Graduate Electronics Engineer at Astrium said: "This Foundation Course in amateur radio, as well as enabling us to gain personal amateur radio licences providing us with the means to communicate with amateur satellites, has given us an understanding of the licence conditions applicable to all radio amateurs."



HARWELL ARS Malcolm, G8NRP, 01235 524 844, info@g3pia.org.uk

10 Summer DF hunt
24 Shack activity night

HASTINGS E&RC Gordon, 01424 431 909, www.herc.uk.net

18 Olympic Torch in TQ80 (WAB)

25 Covert radios talk & demo at the Taplin centre, John Elgar-Whinney

HORNDEAN & DARC Stuart, G0FYX, 02392 472 846, www.hdarc.co.uk

5 Natter night/social evening

16 Follow the Torch event from WAB square SU60

19 Show and tell

21 Weekend event: South Downs Wood Fair at QE Country Park near Petersfield

HORSHAM ARC www.harc.org.uk

5 Photo quiz, G4LRP

12 Social, The Bridge Inn, Amberley BN18 9LR

26 Fox hunt

MID-SUSSEX ARS Rob, 2EORJA, 01444 232 129, 2eOrja@msars.org.uk

6 NFD preparation

7 NFD weekend
13 Radio night post event equipment check
20 Chairman's BBQ - Cyprus Hall closed
27 Radio night and equipment testing for SSB Field day

SOUTHDOWN ARS John, G3DQY, 01424 424 319

2 Barbecue at G3ZQB's QTH
4 Operating at Hailsham shack

SWINDON & DARC Den, M0ACM, 07810 317 750, www.sdarc.net

5 Activity Night and preparation for VHF NFD contest

12, 19 Activity Night
26 Activity Night and preparation for IOTA contest

TROWBRIDGE & DARC Ian, G0GRI, 01225 864 698, E/W

4 Club meeting
18 Natter night

WATERLOOVILLE ARC Rich, G4IBW, 0772 225 002, g4ibw@hotmail.co.uk

29 Talk on WW2 radar systems St Andrews School, Meads joint event with SARS Eastbourne – GB2SAM

Following discussions between the **Southdown Amateur Radio Society** and the local private St Andrews School in Meads, Eastbourne, two special combined events have been confirmed. The aim of these events is to work together in some positive and enthusiastic way for the joint benefit of school children, the school, the club and amateur radio.

A Special Event Station callsign, GB2SAM, has been registered and will be used at the St Andrews School, Meads in Eastbourne. The main school event will be run on the morning of Wednesday 27 June and will consist of four groups of children on rotating interests including: Radio Operating, Aerial Tuning, Morse code, Amateur Radio Computer Software, Radio Operating using Computers, Digital communications via Echolink and DStar, Aerials and RF Direction Finding (Radio Fox Hunting), Practical Electronics, Vintage Radio and Test Equipment.

Following on from the main school event, on the afternoon of Friday 29 June, Southdown Amateur Radio Society will be joined by children from St Andrews School to visit and operate from the Redoubt

Fortress & Military Museum, Eastbourne using the Special Event Station callsign GB2RFM.

This opportunity is very encouraging for the amateur radio and electronics hobby and look forward to very successful events and hopefully even gaining interest in new local Foundation licences. On both events, the club will be operating on HF, VHF and UHF bands, including D-Star and Echolink Special Event Stations.

In fine sunny weather, **Waterside New Forest Radio Club** members once again operated special event radio station GBOETM in the attic at the very top of Eling Tide Mill, celebrating Mills on the Air weekend. This took place during National Mills Weekend, which is a celebration of Britain's milling heritage, organised by the Society for the Protection of Ancient Buildings. Their QSL card shows a watercolour of the mill by local artist, Gervaise Gregory.

The earliest surviving reference to Eling Tide Mill appears in the Domesday Book, in 1086 AD and, over the centuries, it has had to be rebuilt many times, on the last occasion in the 1770s, after

extensive storm and flood damage. In 1975, the mill was bought by New Forest District Council and the work of restoration was begun. Eling Tide Mill Trust was set up, to complete the restoration and to administer the mill as a working mill and museum. In more recent times, Totton and Eling Town

Council took over responsibility for running the mill. Today, the mill is the only fully working and productive tide mill in the United Kingdom, harnessing the power of the tide to grind wheat into wholemeal flour.

GBOETM was set up in the mill by Tim, G4VYV, with transportation assistance from Tony, G6MNL. During the weekend, many club members visited the mill and helped to operate the station. The club's G5RV aerial, stretched between the local yacht club's mast and a club mast, was fed by the radio club's FT-757 GX Mk II transceiver. On the 40 metre band, 83 successful contacts were made with UK and European amateur radio stations, including several operating from

windmills in the Netherlands. There were large variations in signal strength and general RF noise level on the band, but effective transfer of information was always possible.

All club members involved agreed that holding the event in this unusual setting had been well worthwhile and great fun.



REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

APPLEDORE & DARC

Brian Jewell, M0BRB,
01237 473 251
16 Solar systems versus ham
radio, Mike, G3PGA

BRISTOL RSGB GROUP

Robin, G3TKF,
01225 420 442
30 Bring and Buy/natter night

CORNISH RADIO AMATEUR CLUB

Steve, G7VOH,
01209 844 939,
G7VOH@btinternet.com
5 Main club meeting
7 Setting up for rally, any help
welcome, Penair Schoo
8 Cornish Radio Amateur Club
49th Rally, Penair School
19 Workshop evening

EXETER ARS

Nick, 2E0NRJ,
01363 775 756,
info@exeterars.co.uk
2, 16 HF net on 3.675MHz
at 1945
3, 10, 17, 24 2m net on
145.575MHz at 1945
5, 12, 19, 26 4m net on
70.425MHz at 1900
9 4m ex-PMR radio operations,
Moose Centre, 1900
23 Limited space dipoles,
Moose Centre, 1900

PLYMOUTH RC

Rob James 2E0ONO,
Robert-james@virginmedia.com
7 Weekend event. RSGB
National Field Day

10 Antenna building
workshop, Chris Wingate,
M5CJW

28 Weekend event.
RSGB IOTA Contest,
1200 – 1200UTC

RIVIERA ARC

Alan Wyatt G2DXU,
rivieraarc@gmail.com
2, 16, 30 Portable RV
with MXORIV on air
9, 23 Club Night with
MXORIV on air

SALTASH & DARC

Brian, M0BHG,
01752 844 321,
m0bhg@yahoo.co.uk
5 Talk

SOUTH BRISTOL ARC

Andrew Jenner, G7KNA,
07838 695 471
5 VHF NFD briefing
7 VHF National Field
Day weekend
12 VHF NFD debriefing
14 Departure of GB2BLE
Lundy Island
DXpedition

15 QRP in the Country
19 Contact Lundy
DXpedition team
21 GB2BLE Lundy Island
DXpedition returns

TAUNTON & DARC

Peter Robinson, G0EYR,
07811 635 819
4 Members' shack
photos and talks

TORBAY ARS

Dave, G6FSP,
g6fsp@tars.org.uk
6, 13, 20 80m club net
27 Shelter Box presentation

WESTON SUPER MARE RS

Paul, G3SDH,
01761 221 206,
g3sdh@btinternet.com
2 Natter night
9, 23 Morse class &
natter night
16 Talk on radio signal
decoding

YEOVIL ARC

Steve Crask, G7AHP,
steve@g7ahp.co.uk
5 BBQ - bring a radio
12 CW training & local
testing homebrew rigs
19 Radio transceivers in
photography, MOWOB
26 Homebrew HF tests

The Radio Officers Association was very active during the month of April in highlighting the role of wireless in the saving of 705 lives when the *Titanic* was sunk. The National Trust Marconi Lizard Wireless Station and museum created a replica of the *Titanic* Wireless Room as its 2012 display to mark the centenary of the *Titanic* disaster. The Radio Officers Association ran the special event call

sign GB100MPA from the amateur station next to the *Titanic* display; MPA was the call sign of *RMS Carpathia* that, because of its wireless operator Harold Cottam, was responsible for saving the 705 survivors. David Barlow, G3PLE, the National Trust Volunteer Station Manager is pictured operating GB100MPA. Radio amateurs will be able to

operate from the display if they are visiting South West Cornwall.



MLS & S Recruitment

Sales

We are currently seeking additional staff to assist in Ham Radio and Commercial sales. Likely candidate would be a licensed Radio Amateur active in the hobby and have a sales background (not necessarily communications). The ability to communicate clearly and effectively are pre-requisite.

Workshop

Because of our continued success in offering quick and efficient turn around from our Workshop facility, we are also recruiting for either full or part time engineers to work on our huge product port-folio. From Ham to commercial, rigs to antennas, our current team get to work on a massive and varied range of products, to component level.

If you are looking for a career change, know how to sell or engineer and your No.1 goal is keeping customers happy, then contact us today. We are No.1 in Ham Radio because we know how important our customers are to us. If you feel the same and are not afraid of hard, but rewarding, work then email your CV. All communication will be held in the highest of confidence.

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jobs@MLandS.co.uk

REGION 12: EAST & EAST ANGLIA

REGIONAL REP: MARK SANDERSON, MOIEO, RM12@RSGB.ORG.UK

BITTERN DX GROUP

Linda, G0AJJ,
01692 404 154,
secretary@bittern-dxers.org.uk
26 Club meeting at
Pinewood Park

BRAINTREE & DARS

John, M5AJB,
01787 460 947
2 Club BBQ
16 Evening DF hunt

BREDHURST RECEIVING
AND TRANSMITTING SOCIETY

Charles G4VSZ,
07982 244 788
5, 12, 19 Club night,
CW practice
20 Operating GX4WAB for
Follow the Torch ceremonies
from remote shack
24 Essex Secret Nuclear
Bunker trip
26 More on amateur radio
electronics, G3YVF
27 Operating GB20LG
from remote shack

CAMBRIDGE & DARC

Ron, G3KBR,
01223 501 712
13 Operating evening
for beginners
27 Junk sale

CHELMSFORD ARS

Martyn, G1EFL,
01245 469 008,
www.g0mwt.org.uk
3 Quality table top sale,
Colin Page, G0TRM
7 Operating GX4WAB
as the Olympic Torch
is carried through the
City of Chelmsford
10, 17, 24, 31 Club net
nights @ 8.30pm
11 Committee meeting

COLCHESTER RADIO
AMATEURS

Kevan, 2EOWMG,
07766 543 784,
kevan2e0wmg@live.co.uk
19 Scrapheap Challenge,
Matt, 2E0XIS

DARENTH VALLEY
RADIO SOCIETY

Bob, MORAW,
01322 663 804,
to m0raw-bob@talktalk.net
7 Weekend event:
VHF National Field Day
11 SSTV, Ray, G0FDU
25 Natter night,
radio on the air

EAST KENT RS

Karl Davies, M1DFM,
01227 710 120,
karl.davies@talk21.com
9 BBQ at Paul's, G3VJF

HARWICH ARIG

Kevan, 2EOWMG,
07766 543 784,
kevan2e0wmg@live.co.uk
11 Scrapheap Challenge

HILDERSTONE R&EC

Chrissie Turner,
hilderstoneclub@gmail.com
12 Meeting cancelled
due to school prize
giving
19 Olympic Torch Relay
route passes through
Thanet
26 Natter night and
planning meeting
for Wok event

HUNTINGDONSHIRE ARS

David Leech G7DIU,
01480 431 333,
david.leech1@ntlworld.com
12 On the air, 6m
26 HF activity night

LOUGHTON &
EPPING FOREST ARS

Marc Litchman, G0TOC,
020 8502 1645
7 Visit to Aylmers Farm,
Olympic Torch relay
passes through Harlow
15 GBOIS, Theydon Bois
Donkey Derby

NORFOLK ARC

Chris Danby, G0DWV,
01603 898 678,
cmdanby@btinternet.com
1 Barford Radio Rally
at Barford Village Hall
2 RSGB 80m Club
Championship CW
4 Club discussion on
the pros and cons of
contesting
11 Informal meeting,
shack open, workshop
available, RSGB 80m
Club Championship SSB
15 Family & friends
get-together at
West Runton
18 Trophy Foxhunt for the
NARC Foxhunt trophy
19 RSGB 80m Club
Championship DATA
25 The Secret Listeners
by Paul, G3SEM

SOUTH ESSEX ARS

Dave, G4UVJ,
01268 697 978,
g4uvj@btinternet.com
10 Astronomy,
Bruce, G1JJS
27 Start of GB1HF for
the Olympic Games,
various times and
days to 23 August

VANGE A.R.S.

Steve, G0KVZ,
01268 552 606,
vars@live.co.uk
5 Junk sale
12 DVD

19 Talk

26 Natter night
WEST KENT ARS
Keith, G4JED,
westkentars@googlemail.com
9 Club meeting

The weather was fine, making the weekend more enjoyable for **Braintree & District Amateur Radio Club's** Mills on the Air station. The station was set up about three meters from the Bocking windmill, a post mill constructed about 1680, although it was then moved piece by piece twice, first in 1721 and then again in 1830 to the position it is now. The club were glad that the sails no longer move, as it would have brought down their antenna array! HF band conditions were a challenge throughout the weekend, although it did not stop our radio operators contacting about 60 stations. The 80m band was unusable, so the crowded 40m band was used, although it was found there was more success using the CW mode. On 2m, most of the nearby fellow mill stations were contacted.

The club would like to thank all of the operators and volunteers and look forward to next year, with some better band conditions.



During March, Ramsden Hall School hosted a radio station in order to let the students have a taster of a technical hobby and to help them consider electronic communications

as both a hobby and a possible career. A number of boys worked the radio station under the supervision of one of their teachers, Mr Anders, G6HHP, who has held a licence since 1982. The boys were able to experience radio communication under a variety of conditions and used local repeaters to establish some contacts. Before the month finished, Waters and Stanton Ltd of Hockley very kindly gave them a conducted tour and demonstration of their facilities and equipment, which the boys found very interesting indeed. The school would like to thank all radio amateurs that contacted the station and especially LZ4OYG, PA3GV1, ES2TT, RA3PCI, 9A7R, M6KEB, M6ADM/M, G1ZYB and 2EOKIL.

In May, members of **Essex RAYNET** assisted the British Red Cross with checkpoint/safety communications for the Farleigh Hospice Walk for Life. Around 1400 people of all ages walked the 6.5 mile route following the River Chelmer in Essex. RAYNET operators were located at numerous locations including the start / finish line, checkpoints and marshall points. An inbound 70cm voice repeater and APRS digipeater covered the whole route, providing excellent service.

In an e-mail following the event, the organiser said, 'I have to say your team were absolutely fabulous, as always you can really appreciate their commitment even when we had to make changes at the last minute!' A worthwhile charity helped by volunteer radio amateurs. For information on Essex RAYNET please visit www.essexraynet.co.uk.



Continued on page 86



NEW! ID-31E **Handportable** **D-STAR with** **GPS and much** **much more!**

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e-mail: sales@icomuk.co.uk website: www.icomuk.co.uk

Technical feedback

Additional information on the IF filters using Ceramic Resonators article, June 2012

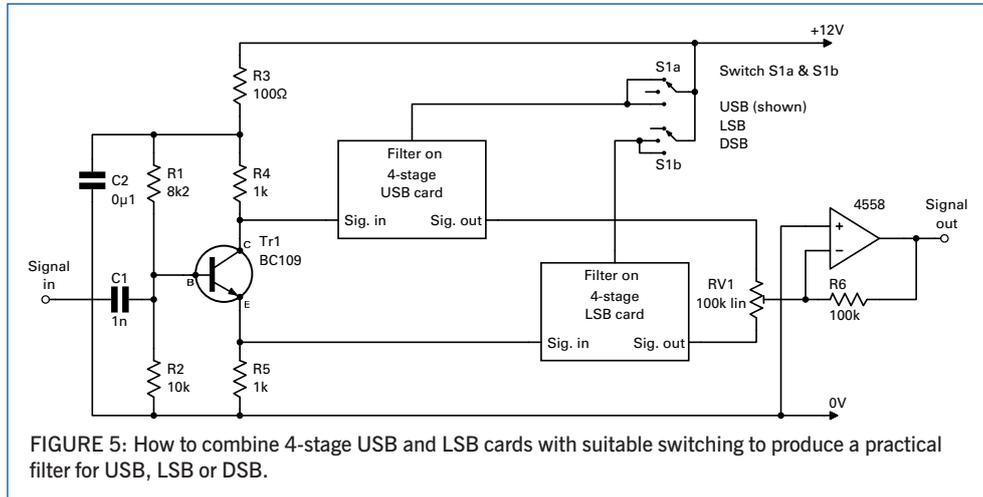


FIGURE 5: How to combine 4-stage USB and LSB cards with suitable switching to produce a practical filter for USB, LSB or DSB.

The performance of the filters might improve if a higher frequency opamps or transistors were to be used.

RESPONSE CURVES. The centre frequency of the response curves plot, Figure 4, is 454.7kHz. This is the frequency that a transmitter carrier insertion oscillator (CIO) or receiver beat frequency oscillator (BFO) should be tuned to, preferably crystal controlled. Perhaps this is a job for a 455kHz resonators and a 56pF fixed capacitor in parallel with a 30pF trimmer.

DOUBLE SIDEBAND. DSB working is accomplished by switching on both the USB and LSB four stage filters, feeding these from a phase splitter and terminating them in a summing amplifier. Again, the method of feeding and terminating the two bandpass filters is intended to reduce out-of-band signals to a minimum.

The preset potentiometer allows for equalising the two filter outputs, ie the upper and lower sidebands, which can be accomplished by feeding the filters with an AM signal with a carrier frequency of 454.7kHz and switching between the two filters while metering the output from the opamp. Adjust the potentiometer for equal outputs.

INTRODUCTION. From the e-mails I have received about my article in the June *RadCom*, it would appear that there is some confusion regarding the circuit diagram of Figure 3. I also neglected to show how to set up double sideband for either AM or NBFM. Furthermore, I did not mention the IF frequency about which these filters work.

FIGURE 3 ISSUES. Figure 3 shows only one stage of either a USB or LSB filter. The original text described how to connect four of these circuits together to produce an USB card or LSB card, as shown in the photo, but did not explain how to turn this into a practical,

switchable filter. Figure 5, here, shows how to drive a LSB and USB card from a phase splitter, switch them, and drive a summing buffer amplifier.

To clarify the note inside Figure 3, the component values used for the USB and LSB filters are as follows:

For an USB filter, C4 = 0 (ie not fitted), C5 = 47pF, R7 = 47k and R8 = 47k.

For a LSB filter, C4 = 100pF, C5 = 150pF, R7 = 47k and R8 = 68k.

The operational amplifiers I used in all the filters are type RC4558. I chose these simply because I happen to have several of them, likewise the BSY95A transistors.

REGION 13: EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

DERBY & DARS
Richard Buckby,
radio@dadars.org.uk

- 3 Junk sale
- 10 Committee meeting
- 17 Video show
- 24 Technical talk
- 31 On the air

EAGLE RG
John, M6JMS, 01754 873 926,
simfree@btinternet.com

- 10 Simple wire antennas,
Peter Day, G3PHO

LOUGHBOROUGH & DARC
Chris, G1ETZ, 01509 504 319

- 3 Radio Ramble
- 10 'Practical Antenna Comparisons' on air from the club
- 17 BBQ at the club, bring own food to cook

- 24 EME planning for 2m or 70cm
- 31 Practical Evening

SOUTH KESTEVEN AMATEUR RADIO SOCIETY
Nigel, MOCVO,
01476 402 550

- 14 Informal evening

WELLAND VALLEY ARS
Peter D Rivers, G4XEX,
01858 432 105,
g4xex@fsmail.net

- 2 2m club net on 145.275MHz FM
- 11 80m SSB contest
- 16 DF hunt in Welland Valley
- 19 80m CC DATA contest
- 20 Commence operating Olympic special event station, active until 12 August

Members of **Denby Dale Amateur Radio Society** operated GX6LD from Golcar Lily Day in May. The event is a local village fete and is one of a number of events where the club takes the hobby out into the wider community to help publicise the hobby. The club were awarded a community grant in 2010 and purchased an Icom IC-706 MK II G especially for this type of event where a small portable station can be used. They were operating the station from the local brewery, which must be one of the best QTHs ever!

Pictures show: Andy, M1LOL watched by Holly granddaughter of MORBG and Ian, MOIAA and Richard, MORBG operating GX6LD.



FREE MEMBERS' ADS

Charges are waived for Members' Ads submitted by e-mail to memads@rsgb.org.uk. One ad per member per month; other important terms & conditions apply (see grey box on page 89).

FOR SALE

9m TELESCOPIC MAST with 12V, 18psi pump, 8 extensions, £300. Yaesu FRG-7000 receiver, £130. Yaesu FC-902 ATU, lovely unit, £30. Manson 603 30V 2.5A variable PSU, £60. ICOM IC-746 transceiver, built-in ATU, £650. All units vgc, prices ono. Viewing welcomed. Tony, G4RUZ, 01367 241179 (Faringdon).

CUSHCRAFT A4S 4 element HF triband beam 20m 15m 10m. Used, but in very good condition, including up-rated boom, RF choke & all stainless fittings. Removed from my tower 28/05/2012. Elements still assembled. Buyer collect ONLY, £525. Adrian Howman, G0FVF, 01362 861370 (1pm - 6pm only) (Dereham, Norfolk).



DIAMOND GSV-3000 30A 13.8V 1-15V variable power supply, £115 + P&P. Manson EP-920 20A 13.8V variable power supply, £55 + P&P. Kenwood LF-30A low pass filters (2), £30 each. Gordon, M0GIQ, 01724 734 742 (Winteringham, N Lincs).

FT-2000D (Nov 07), SP-2000, MD-200, Heil Elite 6, £1500, buyer collects. Ken, G14ERM, 02892 671 095, G14ERM@yahoo.co.uk (Lisburn).

GOING QRT. MFJ-974H ATU, box + manual. 100W HF PA block, ex. FT-707. 70cm 30W MM linear. 2m 100W MM linear. FT-290 / FT-690 / FT-790 Mk 1. TR-751E 2M 25W. £7 each or £50 the lot. GOOVA@uksmg.net, 07763 477 540 (Bracknell).

LDG AT-200 PRO, bought as spare, boxed, manuals, no scratches or marks, £175 ono plus postage. Reason for sale: bought 1000 for linear. MOCVS, 01629 823 025, hamradio12@gmail.com (Matlock).

LDG FT METER. External meter for FT-857/897. Little use, as new, £30 inc p&p. Colin, G3UZM, 01395 273 090 (Exmouth, Devon).

PRE-CIRCULATED INTERNATIONAL REPLY COUPONS (IRCs). Slash your QSL return postal costs vs 'green stamps'! Available in any quantity at £1 each plus £1 postage per order. 25 or more post free. Expiry 31.12.2013. Email for further details. Gordon, G3USR, 01572 737 774, g3usr@btinternet.com (Oakham).

YAESU FL-2100Z 1.2kW input linear amplifier. Fitted pair of Svetlana 572B's. 160-10m inc WARC. Very little use, £450. Collect & inspect from Waterlooville, Hampshire. Vince, G3TKN, lears@tesco.net.

YAESU FT-75 HF TRANSCEIVER. SSB – CW, crystal control or external VFO, 10 crystals fitted & sidetone osc, matching Yaesu FP-75 (AC) power supply, FV-50C VFO, YM-38 microphone and original instruction manual. Good working order. Offers over £75, plus P&P. Peter, GW4GCB, 01745 720 756, peter.kay1@virgin.net (North Wales).

YAESU FT-757GX, £50. Yaesu FT-7, QRP, £50. Kenwood TMG-707, 2 band, £50. Drae 24A PSU, £10. AEA QT-1 300W ATU, £10. Weltz SP-15M SWR/power meter, £10. KW E-Zee match, £10. RAF Type D key, £10. Llaves paddle, £10. Collect only. Tom, G4UGR, 01524 542 663 (Lancaster).

YAESU FT-950 160m-6m 100W transceiver. Excellent condition. Internal tuner and keyer. Original packing, mic, manual. £775 including UK delivery by DHL or buyer inspects and collects. Peter, G4BVH, 01273 563 377, P.L.Reed@sussex.ac.uk (Brighton).

YAESU FT-980 transceiver and matching SP-980 speaker/filter unit. in good working order. Inc mic and manual. Prefer buyer to see and collect, £500 ono. Dave, MOLDQ, 01736 810 338 (Cornwall).

WANTED

DISABLED FAN OF OLD DAYS seeks QSLs, *Short Wave Magazine*, 1955 to 1958 inclusive. memorabilia etc. Also valves, crystals, for Drake, Collins radios. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk IP18 6PQ.

FOR PYE WESTMINSTER W15FM. Dashmount, xtals for 2m band, also microphone, power lead and 10 channel boards. G8HJL, 01513 421 222, ejedwards9@gmail.com.

FT-101ZD MK 3 – email nosmas5@yahoo.ie. [Other contact details withheld at Members' request – Ed.]

HALLICRAFTERS SX-28 receiver. A good home is assured. I am happy to collect. Steve Westell, G3YFG, 01254 822 222, g3yfg@btconnect.com (Clitheroe).

ICOM IC-751A transceiver in good working condition. John, GOLJS, 01380 859 088, g0ljs@arrl.net (Wilts).

OPERATING / INSTRUCTION BOOK (or copy) for Ferguson F20500 DTR digital TV recorder. Will reimburse expenses. Dennis, G4IAD, 01942 817 556, dennis.crompton@talktalk.net (Bolton).

SPARK KEY wanted please. Looking for a Marconi Morse key "Marconi's Wireless Telegraph Co Ltd", or any interesting Morse key from the spark era or more recent. John, GORDO, 01626 206 090, john@morsemad.com (Newton Abbot).

THURLBY TANDAR (TTI) TSA-1000 spectrum analyser adapter. Rob, G3WWI, 01622 758 182, rob.oxley1@gmail.com (Maidstone, Kent).

WODEN MODULATION TRANSFORMERS UM1 and UM2 for my own projects. Bruce, G3WCE, 01692 538 794, g3wce@grimblepoos.co.uk (North Walsham).

YAESU FT-726R INTERNAL WIRING LOOM to allow addition of internal RF band modules. Bob, G8SPC, 01275 874 001, g8spsc@blueyonder.co.uk (Clevedon, Somerset).

YAESU FT-901/902 line up accessories, YR-901 CW/RTTY decoder, FV-901 DM VFO. Please, if you can help me with any of them contact Ian, G4UGD, 07593 681 567, ian.clover@tiscali.co.uk (Tarporley, Cheshire).

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

1 JULY – BARFORD NORFOLK RADIO RALLY – Barford Village Hall & Green, Barford, Norwich NR9 4AB, 9 miles SW of Norwich, close to A11 and A47. OT 9am, £1.50, children free, CP, TI S22, CBS, B&B, TS, WIN, DF, C. Contact radio@dcpmicro.com. [www.norfolkamateurradio.org].

1 JULY – EAST SUFFOLK WIRELESS REVIVAL (Ipswich Radio Rally) – The Orwell Crossing Lorry Park, A14 Eastbound, Nacton, Ipswich, IP10 0DD. TI S22, CP, OT 9.30, £1, CBS, B&B, SIG, LRC, RSGB book stall, GB4SWR HF station, C. Steve, M1ACB, 07711 329 624. [www.eswr.org.uk].

1 JULY – 16TH 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 870 634, g4hzj@ntlworld.com.

7 JULY – BANGOR AND DISTRICT ARS RALLY – Donaghadee Community Centre, County Down BT21 0HB. OT 11.30am, £3, TS, B&B, SIG. Bill, G14AAM 02891 816 707, bill.langtry@btinternet.com. [www.bdars.com].

7 JULY – STOCKPORT RALLY – Walthew House, Shaw Heath, Stockport SK2 6QS. OT 10.00, £1, TS, DIS, CP, C. Tables available £10 each. Details Bernard, G3SHF, 01625 850 088 (day) or Nigel, G0RXX, 07973 312 699 (eves).

8 JULY – CORNISH RAC 49th MOBILE RALLY – Penair School, St Clements, Truro, Cornwall, TR1 1TN. TS, B&B, C, TI, CP. OT 10.30, £2. Details Steve, 01209 844 939, g7voh@btinternet.com. [www.gx4crc.com].

15 JULY – MCMICHAEL RALLY AND BOOT SALE – Reading Rugby Club, just off the A4 east of Reading. TI, free CP, OT 9.30, £2, LB, C, SIG, WIN, TS, CBS. Details Pete, G8FRC, 01189 695 697. [www.McMichaelRally.org.uk].

15 JULY – QRP IN THE COUNTRY – Upton Bridge Farm, Long Sutton TA10 9NJ. QRP & homebrew in a country setting. TS, FAM, SIG. Tim Walford, G3PCJ, walford@globalnet.co.uk.

27-29 JULY – LITHUANIAN NATIONAL HAMFEST – Surviliskis village, district of Kedainiai, Lithuania. [http://lrmd.lt/saskrydis_en.htm].

29 JULY – HORNCASTLE SUMMER RALLY – Horncastle Youth Centre, Willow Road, Horncastle, Lincolnshire LN9 6DZ. OT 10.30, £1.50, DF, C. Tables £5, free power. Details Tony, G3ZPU, 01507 527 835.

29 JULY – BLIND VETERANS UK RADIO & COMPUTER RALLY (formerly St Dunstan's ARS) – St Dunstan's, Ovingdean, Brighton, East Sussex BN27BS. OT 10.30, £2, TS (tables £10), TI, CP, C. Details Eddie, 01273 300 772, eddie@zamboodle.demon.co.uk.

5 AUGUST – CHIPPENHAM & DARC RADIO

BOOT SALE – Chippenham Sea Cadet HQ, off Long Close, Chippenham, approximate post code SN15 3JZ. TI S22. OT 9am for booters, £5 per boot, foot entry on gate £1 (U16 free). On site CP – do not park in Long Close. Map at www.g3vre.org.uk/location.asp.

5 AUGUST – KING'S LYNN ARC RALLY & CAR

BOOT – Gaywood Community Centre, PE30 4DZ. OT 10.00, £2, TS, CBS, C, CS (by prior arrangement). Ray, G3RSV, 01553 849 700, ray-g3rsv@supanet.com. [www.klarc.org.uk].

5 AUGUST – LORN RADIO AMATEUR RALLY

– Crianlarich Village Hall, Crianlarich, near Oban FK20 8QN. £1, TS, B&B, C, CBS. G3MOERV, gmOerv@sky.com. [www.gmOira.freeuk.com].

10 AUGUST – COCKENZIE & PORT SETON

ARC 19th 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.

12 AUGUST – FLIGHT REFUELLING ARS

HAMFEST – Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset. BH21 3DA. TI S22, CP, OT 10.00, TS, CBS, LB, C. Details Mike, M0MJS, 01202 883 479, hamfest@frars.org.uk. [www.frars.org.uk].

17 & 18 AUGUST – 15th INTERNATIONAL

EME CONFERENCE – Churchill College, Cambridge, CB3 0DS. [www.eme2012.com].

19 AUGUST – RUGBY (PRINCETHORPE)

ANNUAL RADIO RALLY – Princethorpe College, Princethorpe, Rugby CV23 9PX. OT 10am – 4pm, £2, CP, TI, C. Contact Tony, G0OLS, 07759 684 411, rally@rugbyats.co.uk. [www.rugbyats.co.uk].

26 AUGUST – MILTON KEYNES ARS RALLY

– Bletchley Park, Sherwood Drive, Bletchley, Milton Keynes MK3 6EB. OT 9.30am, £2, TS, SIG, GB2BP, parking on Sherwood Drive or at railway station, C, CBC, RSGB book stall. Why not make this a family day and visit the Bletchley Park museum too? [www.mkars.org.uk/mkars/rally].

27 AUGUST – Bank Holiday Monday

– **HUNTINGDONSHIRE ARS RALLY** – St Neots Community College, Barford Rd, St Neots PE19 2SH. OT 10.00, £2, TI (S22, V44), CP, CBS, B&B, C, TS, DF. Contact Clive Burchell, G3NKQ, 01480 810 473, clive.burchell@btinternet.com.

2 SEPTEMBER – TELFORD HAMFEST –

Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF, 433.200MHz. TS, B&B, SIG, free CP, LEC, FAM. Details from Martyn, G3UKV, 01952 255 416. [www.telfordhamfest.co.uk].

9 SEPTEMBER – FRISKNEY & EAST

LINCOLNSHIRE COMMUNICATIONS CLUB RALLY – The Friskney Village Hall, Church Road, Friskney, Lincs, 6.5 miles south of Skegness. Details Bren, 2E0BDS, 01754 820 060. [www.felcc.com].

15 & 16 SEPTEMBER – AMSAT-UK SPACE

COLLOQUIUM – Holiday Inn, Guildford GU2 7XZ. LEC, AMSAT shop, GB4FUN. [www.uk.amsat.org].

16 SEPTEMBER – TORBAY ANNUAL

COMMUNICATIONS FAIR – Newton Abbot Racecourse, Newton Abbot, Devon TQ12 3AF. TS, B&B, C, DF, RSGB Books, OT 9.30/10am, £2. Details Mike Dixon, 01803 557 941, rally@tars.org.uk.

22 SEPTEMBER – FOG ON THE TYNE RALLY

– Whitehall Road Methodist Church Hall, Bensham, Gateshead NE8 4LH, organised by Angel of the North ARC & South Tyneside ARS. £1.50, OT 10.30, TS, C. Nancy Bone, G7UUR, 01914 770 036 (eves), nancybone2001@yahoo.co.uk. [www.anarc.net].

23 SEPTEMBER – 22nd GREAT NORTHERN

HAMFEST – Barnsley Premier Leisure Complex, Queens Ground, Queens Road, Barnsley, South Yorkshire S71 1AN. OT 10.30am – 3pm, £3, DF, TS, SIG, RSGB book stall, LB, C, FAM. Ernie, G4LUE, 01226 716 339. [www.greatnorthernhamfest.co.uk].

28 & 29 SEPTEMBER – NATIONAL HAMFEST

– brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB book stall, RSGB Services & Committees, DF, FM. [www.nationalhamfest.org.uk].

6 & 7 OCTOBER – BATC CONVENTION

– Everest Community Academy, Basingstoke. LEC, TS, SIG, Bring & Buy, test & fix area. Includes BATC BiAGM on the 7th. [www.batc.org.uk/club_stuff/convention/index.html].

7 OCTOBER – AUTUMN MILITARIA &

ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, civil, military and vintage radio equipment plus vehicle spares and more. Contact Rod Siebert, 01270 623 353, coldwatr@hackgreen.co.uk. [www.hackgreen.co.uk].

7 OCTOBER – BLACKWOOD AND DISTRICT

ARS RALLY – Coleg Gwent, Risca Road, Cross Keys NP11 7ZA. TI V44 (S22), CP, OT 10am, £2. TS, B&B, SIG, C, WIN. Dave, GW4HBK, 01495 228 516, gw4hbk@talktalk.net. [www.gw6gw.co.uk].

SILENT KEYS

We regret to record the passing of the following members:

Mr B Finch, G0HYZ	2/5/12
Mr C G Newton, G2FKZ	
Mr D Early, G3DGW	20/5/12
Mr S E Green, G3ISG	30/4/12
Mr J H Croysdale, G3OZV	7/4/12
Mr M P Rathbone, G3UZN	13/4/12
Mr S G Casper, G3XON	9/5/12
Mr R A Middleton, G7LLG	14/4/12
Mr J A Curzon, G8GTH	2012
Mr J W Fallows, G14OWB	
Mr A J Cowley, M1EBV	23/4/12
Mr P G Moody, MM0GMP	
Mr W F Beattie, RS90256	24/5/12

12-14 OCTOBER – RSGB CONVENTION

– Horwood House, Little Horwood, near Milton Keynes. Full convention programme with lectures for all interests and all levels of technicality. Principal sponsor Martin Lynch & Sons. [www.rsgb.org/rsgbconvention].

14 OCTOBER – HORNSEA AMATEUR RADIO

CLUB RALLY – Floral Hall, 7 The Esplanade, Hornsea, East Yorks HU18 1NQ. OT 10.30, CP, TS, B&B, SIG, RSGB, RAFARS, LB, C, DF, WIN. Details from Rick, M0CZR, R106221@aol.com. [www.hornsearac.co.uk].

20 OCTOBER – G QRP CLUB MINI

CONVENTION – Rishorth School, Rishworth Sowerby Bridge, West Yorkshire HX6 4QA. OT 10am. Trade enquiries only, g0bps@gqrp.co.uk. [www.gqrp.com/rishworth.htm].

21 OCTOBER – GALASHIELS AND DISTRICT

ARS RADIO RALLY – The Volunteer Hall, St Johns Street, Galashiels, Scottish Borders TD1 3JX. OT 11.30/11.15, £2.50. B&B, TS, C, WIN. Details from Jim, GM7LUN on 01896 850 245, mail@gm7lun.co.uk.

28 OCTOBER – NEW ONE DAY EVENT

– **NORTH WALES RALLY** – John Bright School, Llandudno LL30 1LF. 10am – 4pm, £4.50, TS, B&B, CP, DF, DIS, C, SIG. Details from Gordon, MW0GBR 0773 3531 766 or rally@nwrs.org.uk. [www.nwrs.org.uk].

4 NOVEMBER – HOLSWORTHY AMATEUR

RADIO RALLY – Holsworthy Community College, Victoria Hill, Holsworthy EX22 6JD. Contact gsowter@talktalk.net.

10 NOVEMBER – ROCHDALE & DISTRICT

ARS TRADITIONAL RADIO RALLY – St Vincent's Church Hall, Cutgate, Rochdale OL12 7QL. OT 10.30, £2.50 (Concessions U12 & Seniors), B&B, C. Pitches £7.50. Dave, G0PUD, 01706 346517, dave.shaw1@sky.com. [www.radars.me.uk].

11 NOVEMBER – WEST LONDON RADIO &

ELECTRONICS SHOW (Kempton Rally) – Kempton Park Racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. TI, free CP, OT 9.50/10.00. TS, FM, B&B, SIG, C, DF, WIN, LEC. Details Paul, M0CJX, 08451 650 351, info@radiofairs.co.uk. [www.radiofairs.co.uk].

25 NOVEMBER – 34th CATS RADIO &

ELECTRONICS BAZAAR – 1st Coulsdon Scout HQ, r/o Council Car Park, Lion Green Road, Coulsdon, Surrey. 10.00-13.00, £1, B&B, C, DIS, CP free. Details Glenn, G4FVL, chairman@catsradio.org.

This list shows all rallies and events we are aware of as at 30 May 2012. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e-mail (to GB2RS@RSGB.org.uk) then we suggest you set your e-mail program to request a 'read' receipt so you can be sure we've seen the details.

TI Talk-In; CP Car Park; £ Admission; OT Opening time - time for disabled visitors appears first, (eg 10.30/11am); TS Trade Stands; FM Flea Market; CBS Car Boot Sale; B&B Bring and Buy; A Auction; SIG Special Interest Groups; MT Morse tests; MA Foundation Morse Assessments; LB Licensed Bar; C Catering; DF Disabled Facilities; WIN prize draw, raffle; LEC Lectures/Seminars; FAM Family attractions; CS Camp Site.

SPECIAL EVENT STATIONS FOR JULY 2012

These call signs are valid for use from the date given, but the period of operation may vary from 1 - 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Details published here are kindly provided by Ofcom.

Date	Call sign	Phonetics	Location	Bands	Keeper
01/07/2012	GB4BLC	Bedworth Lions Club	Nuneaton	LH2	G8GMU
	GB4CON	G Bacon	Pontefract	LH2	GOBPK
02/07/2012	GB0PLF	Pontefract Liquorice Festival	Pontefract	LH2	GOBPK
04/07/2012	GBORAF	Royal Air Force	Barnard Castle	LH27	GONRK
06/07/2012	GB6CHE	Cheshire Scouts	Cheshire	LH27	G1NWA
	GB2ING	Ingleton	North Yorkshire	LHV27	MOXLT
07/07/2012	GB0CTC	Crook Town Carnival	Crook	LHV27	G7OCK
	GB5OLR	50 years of Loughton & Epping Forest ARS	ESSEX	LHV2	GOTOC
08/07/2012	GB8SBD	Soap Box Derby	Ludlow	L27	G8XYJ
12/07/2012	GB0FWW	Firepark Wings and Wheels	Lincs	TLH2	MOOOO
13/07/2012	GB0RBL	Rainford Brooklodge School	Rainford	LH27	MOGGK
14/07/2012	GB4NGR	Narrow Gauge Railway	Olney Bucks	TLHV2	MORPM
	GB5SI	Shiant Islands	Isle of Harris	LHV2	MMOBQI
	GB2PPS	Papplewick Pumping Station	Nottinghamshire	LH	GOUYQ
15/07/2012	GB2FX	Felixstowe	Felixstowe	LHV2	GOOZS
19/07/2012	GB4WP	War and Peace	Kent	LHV27	M1CCF
21/07/2012	GB1AVR	Ackworth Vintage Rally	Ackworth	LH2	GOBPK
	GB4GBO	Great Britain Olympics	Lancashire	TLHV2	G1LAT
	GB2BLE	Bristol Lundy Expedition	BRISTOL	TLHV2	GODRX
22/07/2012	GB4WLR	West Lancashire Railway	Preston	H	G1PIE
25/07/2012	2012E	England	Milton Keynes	TLHV27	G3VHF
26/07/2012	2012L	London	London	TLHV2	MOMCV
27/07/2012	GB1HF	Hadleigh Farm	Essex	LH2	G4UVJ
	GB4OG	Olympic Games	Co Durham	LH2	G4LRG
	GB0BVU	Blind Veterans UK	East Sussex	TLHV27	G0PQQ
	GB1HCF	Heckington County Festival	Lincolnshire	LHV27	MOHAZ
	GB2VET	Golf Bravo Two Veterans	East Yorkshire	LHV27	GOSWO
	2012W	Wales	Vale of Glamorgan	LHV27	GWOANA
28/07/2012	GB2WFB	Worthing Fire Brigade	Worthing	LHV27	G8MSQ
	2012U	Uniform	Various Locations	TLHV27	G3BJ
29/07/2012	GB0BVU	Blind Veterans UK	Brighton	TLHV27	G0PQQ

WAB FOLLOW THE TORCH

The Worked All Britain Awards Group is promoting an award based upon following the Olympic Torch around UK. Details were in last month's *RadCom* and are also on the Worked All Britain website, www.worked-all-britain.co.uk.

The WAB call signs will move around UK following the torch, G4WAB & G7WAB being activated as special event stations using the prefixes GX, GT, GN, GH, GS, GP and GC, assigned to the appropriate country. Please note that WAB DOES NOT REQUIRE QSL CARDS.

Confirmed stations taking part in the Follow The Torch scheme are:

14 June	GS4WAB	Lothian RS	5 July	GX4WAB	Norfolk ARC
15 June	GX4WAB	North East Special Events Group	6 July	GX4WAB	South Essex ARS
16 June	GX4WAB	North East Special Events Group	7 July	GX4WAB	Chelmsford ARS
17 June	GX4WAB	Durham & DARS	8 July	GX4WAB	Cambridgeshire Repeater Group/Camb-Hams
18 June	GX4WAB	East Cleveland ARS	9 July	GX4WAB	Luton WAB Members
19 June	GX4WAB	Ripon District ARS	10 July	GX4WAB	Leicestershire WAB Group
20 June	GX4WAB	York ARS	11 July	GX4WAB	Reading & DARC
21 June	GS4WAB	Eddie Stobart "Revival"	12 July	GX4WAB	Blackmore Vale ARS
22 June	GX4WAB	Thornton Cleveleys ARS	13 July	GX4WAB	BYLARA
23 June	GX4WAB	Central Lancashire ARC	14 July	GX4WAB	Brickfields ARS (IOW)
24 June	GX4WAB	South Manchester R & Comp. Club	15 July	GP7WAB	Guernsey RAYNET
25 June	GX4WAB	Denby Dale ARS	15 July	GH4WAB	Jersey ARS
26 June	GX4WAB	Sheffield ARC	16 July	GX4WAB	Hordean & DARC
27 June	GX4WAB	Grimsby ARS	17 July	GX4WAB	Newhaven Fort ARG
28 June	GX4WAB	Lincoln Short Wave Club	18 July	GX4WAB	Brede Steam ARS
29 June	GX4WAB	South Notts. ARC	20 July	GX4WAB	Bredhurst Receiving & Transmitting Society
30 June	GX4WAB	Leicestershire WAB Group	22 July	GX4WAB	Loughton & Epping Forest ARS
1 July	GX4WAB	Stratford Upon Avon & DARS	23 July	GX4WAB	Wimbledon & DARS
2 July	GX4WAB	Coventry ARS	25 July	GX4WAB	Radio Society of Harrow
3 July	GX4WAB	Leicester ARS	26 July	GX4WAB	Wimbledon & DARS
4 July	GX4WAB	Peterborough			

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.

- In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the e-mail address.
- Your advert must clearly show whether it is For Sale or Wanted and must include your name, call sign or membership number, telephone number and postal town, in that order.
- 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.
- 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.
- 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.
- Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
- 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*.
- The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
- Members' Ads are accepted and published in good faith.
- 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.

25 NOVEMBER – NEW VENUE – PLYMOUTH RADIO CLUB RALLY – Harewood House, The Ridgeway, Plympton, Plymouth PL7 2AS. CP, TI, OT 10.00, £2, TS, B&B, C. Contact g7nhb@hotmail.co.uk.

2 DECEMBER – BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY – Spennymoor Leisure Centre, Co Durham DL16 6DB. CP, TI S22 (V44), OT 10.15/10.30, £2 (U14 free). TS, B&B, C, LB, DF, F&M. Details Mark, G0GFG, 01388 747 497.

3 FEBRUARY 2013 – 28th CANVEY RADIO & ELECTRONICS RALLY – 'The Paddocks', Long Road, Canvey Island, Essex SS8 0JA (southern end of A130). Free CP, OT 10.30, C, DF, TS. Vic Rogers, G6BHE 01702 308562, e-mail nvr@blueyonder.co.uk. [www.southessex-ars.co.uk].



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 GODWV, Danby Advertising, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 01603 898678 Fax: 01603 898678 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

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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 derek3xnx@talktalk.net

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.letsnorth.co.uk/dunnet_head Email: briansparks@dunnethead.co.uk

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WANTED

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**To Advertise here call
Chris Danby on
01603 898678**

DXPEDITION FUNDING FOR YOUNGSTERS?

Mark, MONCG

As a young person in my early twenties who has been a licensed amateur for a number of years, I am finding myself increasingly interested in DXpeditioning. Having operated at a number of world-class contest stations, I believe I am a quality operator and I am sure many other young amateurs are in the same situation. However, the ability to get on DXpeditions of any size seems limited at best – to start, most DXpeditions seem to be the same groups of people with little or no scope for addition. Secondly, the cost of DXpeditions nowadays is beyond the limit for all but the most privileged.

I'm sure everybody is aware that getting young people into contesting and DXpeditions, as well as amateur radio in general, is very important; but it seems that a major cost factor has been forgotten. Is there a funding route enabling younger amateurs to take part?

CONFIDENCE TRICK

Andy Jenner, G7KNA

I have recently received two very similar e-mails from overseas amateurs concerning a confidence trick perpetrated in the name of one of our members. Fortunately in one instance the targeted amateur had the foresight to contact our club before taking the transaction any further and we were able to avoid any unpleasantness. Sadly in the second case the target of the confidence trick had already parted with cash but not received the described goods.

The form of the scam or confidence trick is probably well known and is made easier by e-mail and the web. In essence, the confidence trickster either offers goods for sale (that he doesn't possess) at a very attractive price or responds to wanted ads placed by legitimate hams with an offer of the very kit they are looking for, again at a very reasonable price. To bolster his credibility as well as to avoid detection, the confidence trickster will assume a name and callsign that he has derived from callbooks, websites such as QRZ.com or even club websites.

In the case of one of our members, the confidence trickster even created a bogus e-mail account using a member's callsign at one of the many free webmail servers.

The confidence trickster will be very accommodating, showing photos of the kit, boxes, manuals etc and claiming to ship well packed – even inter-continental. They will, however, require payment by services such as Western Union or Money Gram who don't hold cash pending delivery and do not offer redress in the event of default on the part of the seller. Naturally, the confidence tricksters have no intention of shipping the equipment and will disappear as soon as the money is deposited with them.

The amateur who contacted us before parting with cash informed me that he had received four responses to his wanted ad, all of which turned out to be a scam, so this is not an isolated incident.

The text of one such offer read:

"Hi <Name removed>,"

Attached is a photo of my Icom 703+ with original box and manual. Its in excellent working condition and fully functional. Comes like new with BP228 external battery, BC155A Battery Charger, LC156 Back pack, OPC581 Separation cable and AH-703 Antenna for 7-50Mhz. With boxes and manuals.

I am asking \$800 USD for it and price includes shipping and handling. I will arrange double box shipping via UPS or FedEx whichever you prefer and shall accept payment via Western union or Money gram. What's your complete shipping address?

73,

<Name and callsign removed>"

Note the spelling mistakes, and also that despite purporting to come from an English amateur the prices quoted are in US Dollars.

Common sense should protect you from being a target of this sort of scam:

1. Make sure you know what the likely price for any item you are looking for is going to be, check out eBay, eham and other such sites
2. If you are offered the equipment at a too-good-to-be-true price, then it probably is
3. Check the seller's credentials, Google them, use QRZ or other call book services
4. Try to get in touch with them through another channel rather than the possibly bogus e-mail address they may have given you
5. Do not transact using money transfer services such as Western Union
6. Be particularly careful of trans-continental offers.

To avoid being used as the seller's id is more complex in this digital age, however:

1. Check how many sites your name and callsign appears on: Twitter, Facebook, YouTube, QRZ, ARUK etc
2. Try to make sure that these all offer an e-mail address and if possible the same e-mail address so that you can be contacted without using any bogus addresses that a scammer might employ
3. Sanitise and standardise your details as much as possible to avoid too much information being in the public domain.

Although I don't think our club website was the source of our member's problems, I have taken the time this evening to sanitise details on all pages within the site and removed all surnames. This is not foolproof,

obviously any one can use callsigns to look up full names and details but it does at least require the scammer to take an extra step or two in the process.

TIME CONSUMING!

Nigel Auckland, M6NAJ

I really must complain.

This matter has been building since I received my very first copy of *RadCom* some months ago; but the June copy, which arrived today, was too much and I really must register a complaint!

Having risen early, so as to achieve a large number of overdue objectives today, I treated myself to an early coffee before starting. As I went to drink it the post arrived with the June edition. What harm could there be in skimming through *RadCom* whilst drinking my coffee? Oh how naive I was not to realise the skill and cunning of the editor and staff!

Some six and a half hours later, having had no lunch; achieved absolutely nothing; AND missed the last day's play in the test match, I put the magazine down.

I really must protest. What right have you and your team to put together a magazine so packed with interest and information that it demolishes all the best work intentions, destroys domestic harmony and consumes so many hours of one's life (and makes me miss an England Test victory)?

Please do think carefully about what you are doing in future.

I would have telephoned my complaint, but it is so difficult to speak with your tongue in your cheek!

DO YOU QSL?

Nigel Ferguson, GOBPK

For many members of the RSGB, the QSL bureau is an important part of membership. In the past non-members were allowed to collect cards from the bureau but not send them. With the recent changes, non-members are no longer able to receive them (unless they pay to do so – at quite a reasonable charge for the service provided).

The Pontefract & District ARS runs several special event stations each year and now have started asking during the QSO if the station has envelopes at the bureau. Unfortunately we don't always ask, especially when we have a pile-up. The various callsign databases on the internet are useful for finding the QSL route on these occasions. Could everyone with internet access please ensure that their QSL information is up to date on these sites?

The other option we have considered is to only reply to cards received, either direct to myself (with a self addressed envelope and stamp for UK or SAE and \$2 for overseas) or via the bureau. Unfortunately this may mean significant delays between the contact and the confirmation, though with the bureau distributing cards every

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3 months this may not be as bad as I fear.

We have high quality, full colour, QSL cards printed by FDS graphics, and it is a shame that these could be wasted due to the bureau not being a valid QSL route. It also makes extra work for the bureau staff.

Must go now to check our QSL details are up to date!

AMATEUR RADIO AT ITS BEST

Richard, GW1URD

I have, over the years, flitted in and out of amateur radio. Last February I had an operation, which meant I had lots of time on my hands. I switched on my Kenwood TS-480S and started to listen to the amateurs and, slowly, I started to get back in to the hobby. I tried PSK31 and JT65, even buying a rig on eBay, but wasn't sure if I knew what I was doing.

Then I found my local club, Meirion Amateur Radio Society. I went along to one of their meetings. I was greeted like an old friend and was introduced to Simon, MWOGSR, John, MWOVTK and Bob, GWOAYQ. I had a very good evening – a good mix of fun and information. So I parted with my subs and could not wait for the next meeting.

The next meeting was the Meirion RAYNET AGM, fox hunt with wine and cheese afterwards. I was very interested in what was going on and joined RAYNET.

I have found a great group of like-minded people who have all contributed to amateur radio with their constant work from SOS Week to promoting the hobby at local schools fetes. I would like to thank these people for promoting and spreading amateur radio among the populous – with attitudes like these our hobby can only grow.

FUTURE DIRECTION

W4ZCB

With reference to Mike Stewart's 'Future Direction' letter, I offer the following suggestion. The ARRL has just started their online publication of *QST* and I expect that, shortly, it will be available instead of a supplement to *QST* magazine, available as the periodical itself at perhaps some reduced price since the cost of electronic publication is much reduced. In anticipation of the RSGB doing much the same thing, and knowing you have an extensive membership not living in the UK, perhaps it would behave the publisher to offer a

similar program for *RadCom*.

I certainly would not mind having my copy e-mailed or available on the Members Only section of the website. (Printable on the receiving end as PDF's for the more delectable articles of course!) A reduced membership price would be nice, but immediate delivery instead of a three week wait for mail delivery while listening to in-country members discussing mysterious articles and subjects would be frosting on the cake!

Your part in being Green you know.

This letter raises an issue that is currently being discussed by the Board. RadCom is available on the members only section of the web, but using Flash technology, which is far from optimum. We are searching for a better, secure, platform independent means of e-publishing periodicals at a reasonable price. This is a strategic priority for the RSGB. Sadly the technologies used by magazine publishers are not available to us and a number of possible solutions which have been tested have been unsatisfactory. This is an evolving technology, but we hope to find a suitable answer soon.

Don Beattie, G3BJ

Interim Board member

INTERNATIONAL REPLY COUPONS

Tim Beaumont, MOURX

In a recent QSL Matters column, it was mentioned that International Reply Coupons (IRCs) are now obsolete. This is not completely true. Although the Post Office has stopped selling them, they are still in use and can be exchanged for stamps to the value of 87p at the Post Office. For anyone wanting to buy IRCs they are available from many UK QSL Managers such as myself.

YET MORE PEDANTRY!

Don Nappin, G3MLS

I must apologise for yet more pedantry following the letter of 2EONFS in the May *RadCom*.

First, e is not Euler's Constant. Denoted by γ (gamma), that is the sum of an infinite series of approximate value 0.577216. Euler though was responsible for the popularisation of the symbols e and π , also i as $\sqrt{-1}$, still used by mathematicians, though in electrical and electronic fields j is used as i has already been purloined to represent current.

Whilst e and π are certainly irrational,

ie incapable of representation as a ratio of integers, they are both transcendental (don't ask!).

Pedantry over, I will now turn to G3LDO's Antennas article in the April issue. In this he uses a program that calculates the parameters of a loop antenna. Whether this is a small loop – it is of nearly quarter wave circumference – might be argued, that is not at present the point of this letter.

Given the results in G3LDO's Figure 2, and using the formula in MOSOP's article on skin effect, it is possible to back calculate the value assumed for resistivity of the loop material. This is $1.73 \times 10^{-8} \Omega\text{m}$, which is approximately that for pure copper at 20°C.

The resistance of this loop, and indeed most loops, will be larger than this value for two reasons. First, this octagonal loop has sixteen joints where copper gives way to solder. Making reasonable assumptions suggest an increase of 1-2% in this case, though more for a smaller loop.

Secondly, and I have not seen this remarked on in any discussion of small loops, is the metal of which the loop is mainly constructed. Whilst this is copper, it is normally of plumbing quality. Copper to this specification is usually deoxidised with phosphorus, resulting in a residual phosphorus content of about 0.04%. This might seem trivially small but, unfortunately, phosphorus is one of the worst impurities for affecting the resistivity of copper and such a small residual content of phosphorus will probably increase the resistivity by about 35%.

For once though, we are fortunate in that the square root in the skin effect formula shows that the skin depth of plumbing copper will increase by about 16%, thus increasing the loop resistance by the same factor of 16%. One might, though, try silver plating.

I hope this may be of some interest.

QSL BUREAU CHANGES

Cyril Chapman, G2HDR

I have just received 44 cards from my sub-manager, which was a pleasant surprise. Also enclosed was a letter giving details of the changes you have introduced. Of these I thoroughly approve. To me, it has always seemed to me rather unfair that non-members should be able to use Bureau services free of charge. It meant, effectively, that members were subsidising this. The charge being levied is modest and should not be a cause for complaint.

The change to a 'Quarterly' service also meets with my whole-hearted approval. I do not consider myself a heavy user of the bureau and was finding that I was waiting almost a year before enough cards had been received to reach the weight to 'fill' the envelope. This change, then, will be a great improvement.

Thanks for your work on our behalf.



MFJ It's Official! - W&S The World's Largest MFJ Distributor

The World's Largest VSWR Meter!



MFJ-868 If you struggle to read your VSWR & output power, then help is at hand. This meter has a massive 6.5" instrument meter. It features "True PEP and Average" readings (which requires internal 9V cell or external 12v). The power saver circuit also only turns on when the meter is passing RF. Frequency coverage is 1.8 - 30MHz. Range 20/200/2kW. **£159.95 C**

MFJ-867 As above but 144 - 440MHz **£159.95 C**



The World's Most Popular ATUs!

MFJ-949E 300 Watts with Dummy Load



More Hams use the MFJ-949E ATU than any other model in the world! The reason?

Because it is reliable and can match just about any antenna. Wires, coax, balanced, it handles them with ease. The large inductor is rugged and the 8-way antenna switch lets you select your antenna, quickly. You get a large 3 cross needle meter which makes tuning easy. You even get an internal dummy load. No wonder it's the hams choice! **£169.95 C**

MFJ The World's Most Popular AUTO ATUs!

MFJ-993B IntelliTuner Auto ATU 300 Watts 1.8-30MHz



This tuner lets you tune any antenna; long wire, coax cable or balanced feed. You get both analogue cross-needle metering & LCD data display! MFJ's exclusive IntelliTuner Adaptive Search and instant recall algorithm gives you ultra fast tuning with 20,000 memories! Beat that! Select 300 Watts for 6-1600 Ohms matching or 150 Watts for ultra wide 6-3200 Ohms. Versatile antenna

selection and pre-used setups are found in milliseconds! This tuner matches virtually anything you throw at it. **£254.95 C**

MFJ-925 Ideal For IC-7000/FT-857D



This compact auto ATU sits nicely under the IC-7000 or FT-857D. It's all you need

for a complete automated station that will match any antenna! **£174.95 C**

MFJ-991B 300W Auto ATU



Handles 300W, fitted cross needle meter.

Wide range: coax, balanced or wire. 300 Watts level matches 6-1600Ohms, or 150 Watts with wider range of 6 - 3200 Ohms. **£214.95 C**

MFJ-928 Econo 300W Auto ATU



Here's a very economical Auto ATU.

No metering, but lightning fast tuning with 20,000 memories and wide matching range. Leave it in-line and just forget about it! **£203.95 C**

Great Ideas!

MFJ-1026 Local QRM Killer



Get up to 60dB null! This unit samples the local noise using a short detector antenna. The result has the effect of cancelling the noise but leaving the main RF wanted signal unaffected. What a great idea! **£204.95 C**

MFJ-434B Contest Voice Keyer



Another great idea for contest work or general CQ calling on a dead band!

Ideal for VHF or HF. Transformer coupled means no hum or RF feedback. You get up to 75 seconds recorded time divided in up to 5 messages. Repeat feature with variable 3 - 500 seconds gap. Accepts modular or 8 pin round connectors with dip switches to suit your radio. Leads included for output. It really does take the hard work out of intensive operation & preserves your voice. **£204.95 C**

MFJ-929 World's Fastest ATU



World's fastest compact auto ATU. The algorithm offers 132,072 solutions and instantly matches any

antenna with near perfect VSWR. Get the best from your antenna! **£214.95 C**

MFJ-998 1.5kW Auto ATU



This Auto ATU will handle really high power, which makes it

well above UK limits and also offers great efficiency. You get the same fast tuning, with cross needle metering & LCD display. Coax, balanced or wire. **£659.95 C**

MFJ-927 Remote ATU



Here's a great way to tune wire or coax. This fully weatherproof ATU will sit outside right by your antenna and with the included "power thru" box, you

feed the DC supply up the coax. No separate hh cable needed. **£259.95 C**

MFJ-989D 1.5kW 1.8-30MHz



The latest version gives lower losses and true peak reading. Includes 6-position antenna switch and dummy load. **£399.95 C**

MFJ Vertical HF Antennas



MFJ Vertical HF Antennas. Ideal for small gardens.

MFJ-1796 A 1.5kW 40m - 2m self supporting vertical. Requires no radials. Height 3.65m **£244.95**

MFJ-1798 An 1.5kW 80m to 2m vertical that is self supporting and needs no radials. Height 6.7m **£309.95**

MFJ For details of the full range of MFJ products check out our web site!

MFJ-969 300W Roller Inductor



160 - 6m, it will match wire, coax or balanced. It reads true PEP (requires 12v DC or internal cell), Fitted cross needle meter and, Dummy load, and QRM-Free Pre-Tune. **£219.95 C**

MFJ-941E 300W 1.8-30MHz



Great value, has cross-needle meter, 1000v balun and 8-position selector switch. A great ATU at budget price. **£144.95 C**

MFJ-948 300W Roller Inductor



Very similar to the MFJ-949 above, but without the dummy load. The same 300 Watts and the same great design. This tuner will meet all your needs and your antennas. **£164.95 C**

MFJ-945E 300W 1.8-30MHz



Designed particularly for coax mobile systems. Now you can move around the band so much easily. **£134.95 C**

MFJ-962D 1.5kW 1.8-30MHz



This low profile model retains the 1.5kW and incorporates a roller coaster tuning and twin needle meter. **£299.95 C**

Hygain Verticals



Hygain make a wide range of vertical antennas, specifically designed to handle high power and offer DX performance by virtue of the inherent low angle of radiation. Hygain antennas are now made by MFJ and as the sole UK importer we are able to supply full back-up service on the complete range. For further info & prices www.wsplc.com.

Hy-Gain Rotators

AR-303X £99.95 D



Lightweight Rotator for small beams. Check out this new low price!

It's Antenna Time! We carry the full range of Hy-gain rotators & will be happy to advise which is the best for you. We also carry good stocks of rotator cable & antenna accessories.

- AR-40X VHF or Mini HF **£379.95 D**
- CD-451X Small HF **£489.95 D**
- HAM-IVX Medium HF **£689.95 D**
- HAM-VX Heavy Duty **£1149.95 D**

Antenna Analysers

NEW MFJ-266 Every Ham Needs One!



Covers 1.5-65MHz (in 6-bands) plus, 85-185MHz & 300-490MHz. In analyser mode you get freq. VSWR, complex impedance and magnitude - all displayed simultaneously, on high contrast LCD. In Counter Mode, you get 500MHz range, with 100Hz resolution & field strength. Functions as 10dBm signal source and can measure inductance & capacitance. **£339.95 C**

MFJ-259B 1.8 - 170MHz Analogue meters. Measures VSWR, complex impedance & magnitude. Coax velocity, distance to open or short circuit. Counter, generator, inductance, capacitance, freq counter & LCD digital display. **£269.95 C**



MFJ-269 Covers 1.8-170MHz & 415-470MHz plus 12-bit A/D for improved accuracy. Reads complex impedance, magnitude PLUS parallel resistance & reactance! Read coax specs & problems. Plus acts as generator & freq. meter. N connector. **£359.95 C**



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Waters & Stanton have been appointed exclusive resellers for Elecraft in the UK.

Now You Can Part Exchange & Trade Up To Elecraft!



Peter Waters, G3OJV, has long been a fan of Elecraft gear and his simple K2 station is shown above. "Together with a ground mounted vertical, I can work the world" says Peter.

Elecraft are renowned for their performance, reliability and value for money. More and more DXpeditions are choosing Elecraft because it combines technical excellence with easy transportable size. Made in California, USA, the line up includes features that satisfy just about every aspect of the ham

radio hobby. From QRP to QRO, and from CW through data modes to SSB; there are features and accessories that will fulfill your needs, and more. You can read the reviews on the Elecraft web site and download the manuals. There is an abundance of data and technical help. Waters and Stanton are privileged to

represent Elecraft in the UK and will be introducing a range of finished, ready to go radios for the UK ham operator. We will be more than happy to offer great part exchange deals, even on really old rigs.

Elecraft, arrives in the UK - Time for a change!

K3 Transceiver 10/100W 160-6m (2m)



The Only Affordable, and Portable, Elite-Class Transceiver - Now with optional P3 Panadapter

leaves your world-travel budget intact. And at only 3.6kg (and 10x25x25cm), you can take it with you! The K3 excels wherever the action is — demanding Field Day sites, remote DXpedition outposts, high-power contest operations — or the comfort of your own home station. And the firmware is upgradeable from the internet so your radio is always up to date. Time to make that change!

Only a few transceivers combine a stunning array of features, fully independent subreceiver, a high-performance analog front end, and I.F. DSP. They are all equally expensive. Now, Elecraft has brought the high-end rig back to earth with the K3. At a fraction of the price of other transceivers in its class, it's the only "dream" radio that

**Built £1999 D
Kit £1899 D**

KPA-500 Linear Amplifier 500W 160-6m



A Completely Self-Contained 500W Linear Amplifier - The Same Size as the K3!

also be used to change bands on the K3. Also the K3 can even select per-band amplifier drive levels automatically when the amp is placed into operate mode, so you'll rarely need to adjust power output. But the KPA-500 is not just limited to use with the K3 — It is fully compatible with most radios. The KPA comes with a 230V AC built-in PSU. Time for a change!

A 500-watt solid-state amp that's so well integrated, you'll think its reading your mind. The KPA-500 features 160-6m coverage, instant RF based band switching with any radio, alphanumeric status display, bright LED bar graphs, and a rugged, built-in linear supply. The amp's manual band switches can

**Built £2099 D
Kit £1989 D**

K144XV Adds High Performance 2m Transceiver to K3



£TBA

With an Elecraft K144XV internal 2 meter module installed, your K3 will make another leap forward in versatility. The K144XV covers the full 144-146 MHz allocation, so you can do weak-signal CW/SSB work as well as access 2m repeaters in your area. The receiver has excellent sensitivity and dynamic range. Maximum transmit power output is 8-10 W in all modes, with diode switching for silent, relay-free T/R. It presents a very clean signal for linear amplification.

KX3 Transceiver 160 - 6m 10W + PSK31



The revolutionary Elecraft KX3 puts the world in the palm of your hand! Despite its small size, it covers all amateur bands from 160-6 meters, operates in all modes, and has DSP-based features usually found only on larger radios.

The KX3's unique form-factor allows you to operate from anywhere. Fold out the rear tilt-feet for use on a desk-top or picnic table, or add our rugged

mobile mount bracket for vehicle use. For extreme portability, you can add the internal wide-range ATU, 8-AA cell battery pack with NiMH charger, and adjustable KXP3 keyer paddle. With a whip antenna, you can even operate hand-held. In receive mode, current drain can be as low as 150 mA - about one-half to one-third that of competing all-band portables. Transmit efficiency is also excellent, further improving battery life. This item is currently subject to a back order list and customer should check estimated delivery when ordering.

Latest Prices On Our Website

P3 Panoramic Adaptor 2.5 - 200kHz Bandwidth



Elecraft - Totally Portable - Totally Enjoyable

It feels like a real PC screen, and is the perfect partner for the K3. The new Elecraft P3 PanAdapter display adds a visual dimension to signal hunting with fast real time spectrum and waterfall displays of band activity. The P3 offers superior sensitivity and DSP processing, giving you the ability to see signals down to the K3's noise floor. The P3 can also be used with any other radio that provides an IF output of 455 kHz to 21.7 MHz looking for band openings.

Built £785 D Kit £715 D



XG3 Signal Source

This compact device is a calibrated signal source that runs on an internal PP3 battery or an external 12v PSU. It is individually calibrated on the bands 160m to 2m and can be switched to generate either 1uV or 50uV. In addition it can generate a massive 0dBm signal. It is highly stable and locked to a programmed frequency on each band. This can be changed using the supplied data lead and a PC. It is great for receiver checking and S-meter calibration.

£TBA

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



ICOM

COMMUNICATIONS RECEIVER

IC-R2500

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

Dualwatch, Digital Mode, Diversity Receiver

Dualwatch capability

The IC-R2500 has dualwatch receive capability*, allowing you to receive two bands simultaneously. It covers 0.01–3299.999 MHz in AM, FM, WFM, SSB, CW, DV** and P25** modes on the main receiver, while the sub-receiver covers 50–1300MHz in AM, FM and WFM modes.

* Two antennas are required for dualwatch receive. ** Optional UT-118 required. ** Optional UT-122 required.

Diversity receive capability

The diversity receive* mode is useful for mobile operation where the received signal changes continuously. It compares the signal strength and chooses the antenna with the better signal to maintain good sound and receive quality.

* Two antennas are required. Available in FM/DV/P25 mode between 50–1300MHz only. Diversity reception is not available while using dualwatch.

Wide LCD display for independent band control

The wide LCD display shows both main/sub receiver settings in an easy-to-read symmetric side-by-side layout. The controller provides separate tuning, volume, squelch knobs and function buttons for the left (Main) and right (Sub) receivers. The LCD backlit color is selectable between amber and green for your preference.

OPTIONS

- **UT-106 DSP UNIT**
Provides noise reduction and auto notch functions.
- **UT-108 DTMF DECODER UNIT**
DTMF decode function for Sub-receiver. Either UT-108 or UT-118 can be installed in the receiver.
- **UT-118 D-STAR DIGITAL UNIT**
Provides D-STAR DV mode reception. Either UT-108 or UT-118 can be installed in the receiver.
- **UT-122 P25 DIGITAL UNIT**
Provides APCO P25 digital mode reception.
- **OPC-1156 CONTROLLER EXTENSION CABLE**
Extends the supplied separation cable by 3.5 m (11.5 ft). A modular connector is supplied with the cable.

- **SP-10 EXTERNAL SPEAKER**
To better direct the audio where you want it.
- **MB-84 REMOTE CONTROL BRACKET**
Mounts the controller in a convenient location.
- **MB-65 MOUNT BASE**
Mounts the controller with the MB-84. Adjustable angle and direction for optimum positioning.
- **CP-12L CIGARETTE LIGHTER CABLE**
12V DC, 2A output from 12V cigarette lighter socket.
- **AD-113A/E AC ADAPTOR**
10.5V DC, 1.8A/1.5A (A/E) output. Same as supplied.
- **OPC-254L DC POWER CABLE**
For use with an external power supply. (12V DC required)

Digital mode reception

The optional UT-118 D-STAR digital unit and UT-122* P25 digital unit provide the latest digital mode reception. Catch the action in digital communications!

* Already installed with some versions.

1000 alphanumeric memory channels

With Icom's Dynamic Memory Scan, DMS, you have a versatile memory channel management system at your command. The 1000 memory channels can be arranged by service or personal preference in the 21 memory banks. Selectively link the channels together to scan depending on your needs. Programming the memory channels and 6 character memory names is simple with your PC.

Other features

- Optional DSP capability with UT-106
- VSC (Voice Squelch Control) ignores unmodulated signals or heterodynes
- IF filter selection for changing IF filter width
- Noise blanker eliminates pulse type noise (SSB, CW, AM mode only)
- AFC function automatically follows an FM signal when the signal's frequency drifts (BW: 6kHz or 15kHz)
- IF shift function (SSB, CW mode only)



Supplied accessories (* Depending on version)

- AD-113A/E*
- USB cable and antenna
- Software CD
- Controller head and cable, (3.4m; 11.2ft)

CONTACT US

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Web: www.hamradio.co.uk
E-mail: sales@hamradio.co.uk

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