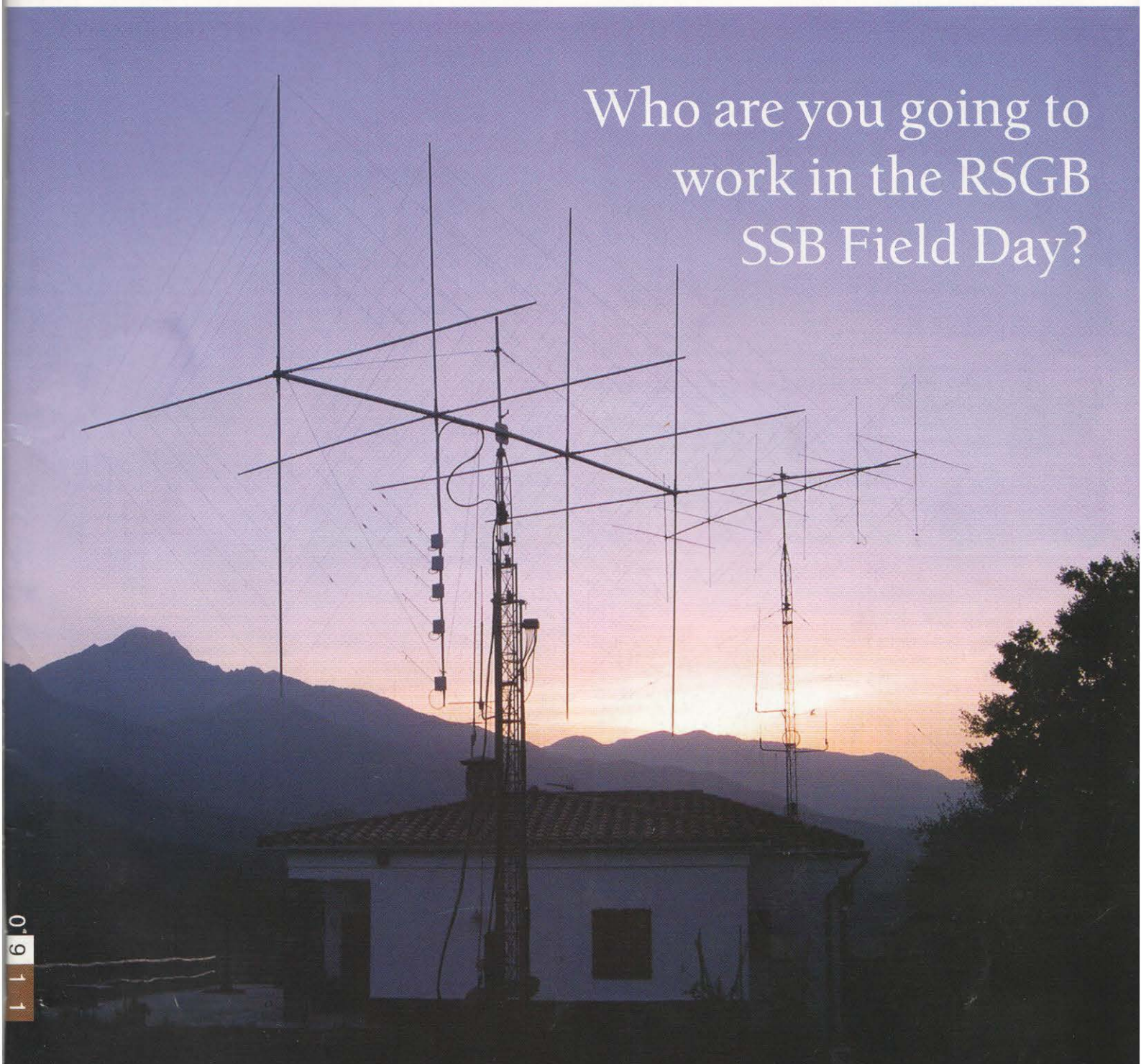
RadCom

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

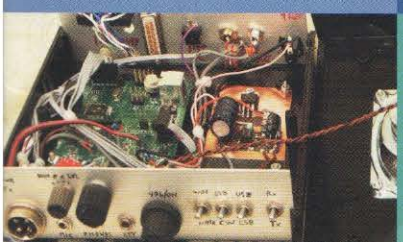
SEPTEMBER 2011
VOLUME 87
NUMBER 09
£4.75



Who are you going to work in the RSGB SSB Field Day?

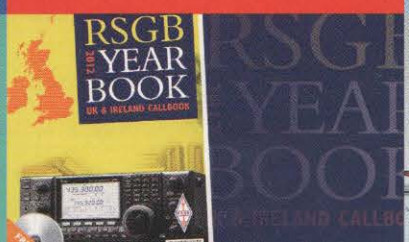
0911

Design Notes
Software Defined Radio – no PC required

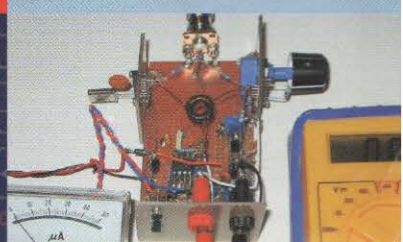


National Hamfest
The biggest two day rally in the UK

RSGB Yearbook 2012
The essential reference for amateur radio enthusiasts



Crystal Bridge
Precision measurement of quartz crystal parameters



WATERS & STANTON

UK's Lowest Prices!

Orderline
01702 206835

Online Catalogue
www.wsplc.com

KENWOOD

Amazing TS-590S!

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

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

£1329.95 D

NEW TH-D72E *JUST ARRIVED!*

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

£426.95 D

TS-480 Transceiver *GREAT PRICES!*

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

TS-2000 Series *GREAT PRICES!*

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

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

VHF Mobiles & Handhelds

TM-V71E	Dual band mobile with echo link	£299.95 D
TM-271E	2m FM with mighty 60W output	£169.95 D
TM-D710E	Dual band mobile 50W with APRS	£445.95 D
TH-F7E	2m/70cm 5W SMA +FREE Clip Mic	£236.95 D
TH-K2E	2m 5W 4-Key Keypad SMA + FREE Headset	£163.95 D
TH-K2ET	2m 5W 16-Key Keypad SMA + FREE Headset	£172.95 D
TH-K4E	70cm 5W SMA + FREE Headset	£163.95 D

YAESU

FT-950 HF & 6m Transceiver

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

Back In Stock! £1265.95 D

FT-2000 160 - 6m Transceiver

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

£1999.95 D

FT-2000D 200W 160 - 6m 230v AC PSU transceiver **£2599.95 D**

YAESU

Two Great Mobiles

FT-2900E
75 Watt 2m mobile with 3W loud audio, CTCSS, DTMF mic and the "WIRES" internet feature.
£139.95 D

FT-7900E
2m/70cms mobile delivers 50/40W with CTCSS, DTMF, "WIRES" internet, 1000 mems and wide rx up to 999MHz.
£239.95 D

FT-450D 3yr Warranty!

NEW

£799.95 D

Now with Auto ATU & Extra filter.
Are you looking for a reliable and feature packed HF transceiver that is affordable, yet can compete with the modern day demands of ham radio and the crowded bands? The take a careful look at what this radio has to offer. And to make it even more attractive, for a limited period we are offering you a 3-Year warranty - **FREE.**

PART EXCHANGE WELCOME

HF Transceivers

FT-DX5000	200 Watts of raw power and performance.	£4399.95 D
FT-DX5000D	200 Watts plus additional station monitor.	£4795.95 D
FT-DX5000MP	200 Watts plus additional station monitor & filter.	£5295.95 D
FT-DX9000contest	200W HF - 6m "formula one" contest machine	£4899.95 D
FT-DX9000D	Deluxe fully loaded base station	£8199.95 D
FT- DX9000MP	Amazing 400W "legal limit" radio	£8999.95 D
FT-857D	HF to 2m mobile. portable or base - up to 100W	£679.95 D
FT-817ND	1.8-440MHz all mode transceiver	£509.95 D

VHF Mobiles & Handhelds

FTM-350E	2m/70cm Mobile Bluetooth GPS APRS	£479.95 D
FTM-10E	50/40W 2m/70cms stereo FM	£309.95 D
FT-8800E	Dualband Mobile 50W / 30W	£329.95 D
FT-8900R	10/6/2m & 70cm Mobile	£369.95 D
VX-3E	2m / 70cm Handheld Wideband receive	£159.95 D
VX-7R	Waterproof dualband handy (silver / black)	£289.95 C
VX-6E	2m/70cms handy, 5W Wideband Receive	£239.95 C
VX-8DE	Triple Band 6/2m/70cm Upgraded APRS	£369.95 D
VX-8GE	Dualband 2m/70cm 5W + GPS Antenna	£359.95 D
FT-60E	2m/70cms, 5W handy Wideband Receive	£129.95 C

< VX-8DE

YouKits FG-01

NEW Antenna Analyser

Graphic Colour Display!

It is what you have been waiting for.
A graphic antenna analyser that covers the complete HF spectrum and gives a clear picture of your antenna esinance and performance. Covers 1.8 - 60MHz with adjustable seep range. Operates from battery and has a COLOUR screen!
Available late summer, get your name on the waiting list now as supplies will be limited at first!

£229.95 C

Alex-Loop

PORTABLE 7-BAND LOOP!

Covers 7 - 30MHz continuously and folds down into a small package that fits in a brief case. It also features a rotary control for easy thumb tuning.

** 40/30/20/17/15/12/10m*
** Manual Tune In Seconds*
** 1m Diameter Loop*
** Packs In Case 40 x 27cm*
** 20W QRP Design*
** Includes Loop Mast*
** Easy Handheld* **£306.95 D**

MFJ Vertical HF Antennas

MFJ Vertical HF Antennas. Ideal for small gardens.
MFJ-1796 A 1.5kW40m - 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

YouKits HB-1A-MK3

QRP Transceiver

Completely self-contained CW transceiver with LCD digital readout and great performance - Full QSK with electronic keyer.

£199.95 D

40m & 20m Full band coverage

Tx: CW	**Rx:** SSB CW & AM
Filters	Crystal for CW & SSB
Keyer	Built-in
Power Out	3W dry cells 5W 13.8v
Memories	20 Channels
Volts	9 - 14V
Internal	8 x AA cells
Tuning Steps	100kHz - 10Hz

The HB-1A is great for QRP or travel. It has a detailed LCD digital panel and recognises straight or bug key automatically. You can program in your own call and CQ for auto sending. Easy speed adjustment and 4 CW bandwidths. Also receives SSB with another 4 bandwidths. RIT and 10 memories. This is an exclusive product to Waters & Stanton. See demo at RSGB Newark Show and October Convention

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

WATERS & STANTON

Head Office & South
Spa House, 22 Main Road,
Hockley, Essex, SS5 4QS.

Enquiries: 01702 204965
Fax: 01702 205843
Email: sales@wsplc.com
Opening Hours:
Mon-Sat 9am-5.30pm

JAYCEE

Scottish Store W&S @
Jaycee, 20 Woodside Way,
Glenrothes, Fife, KY7 5DF.

Phone: 0845 5050128
Fax: 01592 610451
Email: jayceecoms@aol.com
Opening Hours: Sat 9am-4pm
Tue-Fri 9.15am-5pm Closed Monday

Fast Same Day Despatch Service!
Orders Received Before 3pm

Buy Now Pay Later Available!

Get The Latest News First
Follow @wsplc on twitter!

twitter

YAESU
The FT-DX5000 Package!

The radio that will take you to new levels. Built-in AC PSU all in the box. 200 Watts output for 2-element gain on all bands. TWO totally separate receivers. IP3 +40dBm. 2 or 3 roofing filters (model dependent). 9MHz out for SDR use.

FT-DX5000 - ±0.5ppm TXCO - Included. **£4339.95 D**

FT-DX5000D - ±0.5ppm TXCO - Included + SM-5000 Station Monitor **£4795.95 D**

FT-DX5000MP - ±0.05ppm OCXO – Inc. + SM-5000 Station Monitor & 300 Hz Roofing Filter **£5295.95 D**

The FT-5000 series brings perfection even closer. This radio is designed for the serious DXer. Whether it's weak signals on the border of band noise, or high level crowded band conditions, the FT-DX5000 copes with ease. The DSP brings selectivity & QRM reduction to a new level of performance. Short wires, dipoles, big arrays - no matter what you connect, this radio handles them with ease. You can close in on any signal and with dual receivers, DX chasing is even easier. CW/ Data operators can get right down to 50Hz selectivity, and with the built-in ATU, QSYing is easy and quick. It's the radio that gives you what you have always dreamt of - it's Yaesu of course!

Buy any NEW FT-DX5000 Model from us & get the extra package:

* *Heil HM-12 Mic + Desk Stand & Lead*
* *Watson HP-200 Headphones*
* *15% Antenna Discount Voucher.*
* *15% ATU Discount Voucher*

MFJ-1795

Small Garden Solution
40 -6m Just 12ft Tall!

If you are looking for an HF ground mounted antenna that will fit into the smallest of gardens, take a look at the MFJ-1795. Just 12ft long, it auto switched to 40m, 20m 15m, 10m and 6m. Handles full UK power. Use it as a base station antenna for portable work. Available now.

£174.95 D

AIRNAV RADARBOX-3D

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

£489.95 C

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

RadarBox-Pro No 3D **£399.95 C**

FlexRadio Systems®
Software Defined Radios

Cutting Edge of Ham Radio

FLEX-1500

The 5 Watt tiny HF-6m transceiver that works great with a laptop.

£599.95 D

FLEX-3000

The 100 Watt award winning HF-6m transceiver with auto ATU.

£1299.95 D

FLEX-5000A

Top range 100W HF-6m with amazing receiver and lots of options.

£2499.95 D

FLEX-5000A-ATU **£2799.95 D**
with Auto ATU built-in.

QUANSHENG

TG-UV2 2m/70cm Dual Bander

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

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

£81.95 D

TEN-TEC

TenTec, the "sports car" of the ham radio world that puts you right on the front of the grid!

NEW Eagle-599

SDR Performance in a Box!

As Reviewed in RadCom

The Eagle Has Landed! 160m-6m. A new design rom TenTec. small enough for portable or mobile with 3 IFs - the last being 0kHz DSP. We have just got the first batch of this exciting radio. It's TenTec's newest and has been getting rave reviews.

A created a transceiver combining simplified controls and ease of operation with the excellent performance of a low first IF 160-through 6-meter ham-band architecture in a compact, mobile-friendly structure. The low bass band IF brings SDR to the hardware transceiver! PC performance in a box!

£1734 D

Jupiter-538B

100W SSB CW AM FM 160m - 10m

Get a new experience in performance and innovation under the bonnet. 160m - 10m with 100 Watts output. The classic TenTec radio - it can even decode CW on the screen and send CW via a PC keyboard.

£1549 D **With internal ATU £1839**

Omni-VII-588

100W SSB CW AM FM 160m - 6m

Fire it up and you immediately know you are driving something different. The receiver is a delight and the transmitted audio is superb. Connect d to your home router with ethernet cable and you can remotely operate from anywhere in the world.

£2569 D **With internal ATU £2849**

MFJ

MFJ-993B Auto ATU

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 thow at it.

£254.95 C

Check out the full range on our web site and see why customers prefer MFJ - **www.wsplc.com**

Butternut Vertical Antennas

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

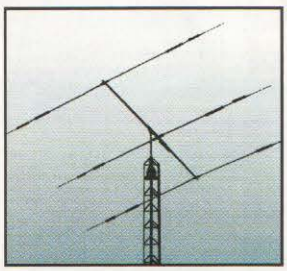
HF-2V 80, 40m DX vertical. 9.75m, Easy erect. **£299.95 D**

HF-6V 80,40,30,20,15,10m self support 7.9m **£399.95 D**

HF-9V As HF-6V but adds 17,12 & 6m. 7.9m **£459.95 D**

HyGain Beam & Wire Antennas

TH-3JRS



The compact 3-Band 20 - 10m 600W beam is back in stock, Less than 15ft turning radius and great performance with good bandwidth.

£399.95

TH-1	3-Band 1.5kW dipole	**£329.95**
TH-2MK3	3-Band 2 el. 1.5kW	**£399.95**
TH-3MK4	3-Band 3 el. 1.5kW	**£529.95**
TH-5MK2	3-Band 5 el. 1.5kW	**£799.95**
TH-7DX	3-Band 7 el. 1.5kW	**£949.95**
TH-11DX	5-Band 11 el. 1.5kW	**£1249.95**

Watson Cross Needle Meters

High quality, accurate VSWR meters with large, clear display featuring X-needle movements.

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

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

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

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

WATERS & STANTON

Orderline
01702 206835

Online Catalogue
www.wsplc.com

JAYCEE

Bill, Betty & Scott Invite You To

JAYCEE OPEN DAY 2011!

Saturday 17th September 10-4pm

W&S Scottish Branch @ Jaycee Electronics, Glenrothes, Fife.

Free Refreshments, Free Parking!

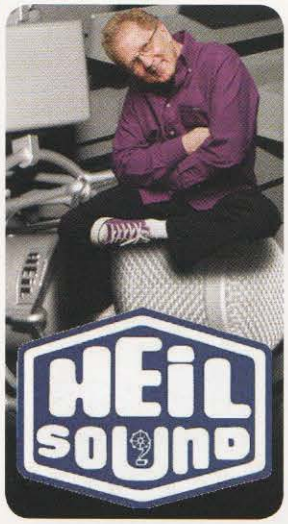
Kenwood, Icom & Yaesu Stands!

ICOM KENWOOD YAESU Choice of the World's top DX'ers

Charity Raffle with Great prizes!

1. Icom ID-E880
2. Yaesu FT-8800E
3. Kenwood TMD-710E
4. Quansheng TG-UV2
5. Goody Bag

Come & Grab A Bargain At Scotland's Premier Event!



Bob Heil K9EID with W&S at The National Hamfest! 30th Sept /1st Oct

NH National Hamfest

Get His Signed Commemorative QSL Card

Come and Meet Bob Heil. Hear his microphones in action and listen to his mini lectures, LIVE on our stand. This is a W&S exclusive. Bob makes one of his rare visits to the UK bringing his demo gear with him. You will also get a chance to get a personal signed QSL card and the opportunity to take advantage of special deals on the Day. Want to improve your audio? Need to know how to adjust that EQ control. Come and pay us a visit.

The NEW Genesis Series
The Low Cost Entry Level Heil Sound

Genesis HM-12

If your radio has EQ (Equalisation) mic. adjustment, then you need to invest in the new Genesis HM-12 hand mic. The little fist microphone that comes with your rig is a compromise at best and cannot realise the full potential of your radio, talk power, or the EQ possibilities. The HM-12 is designed to perfectly integrate with your rig's EQ mic amplifier stage and let you tailor your audio EQ to match your voice and style of operating. It gives you the quality of audio that no other mic can match. Quality that you will be proud of and a signal that is both distinctive and capable of effective DX contacts and contest rewards. In short, the HM-12 will transform your signal and operating. **£69.95 C**

HEIL GENESIS

Pro-Set-6

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

Pro-Set-6 £149.95 C
AD-1 Rig adaptor leads £22.95 C

Pro-Set-6-Elite

Modelled on the ProSet-6 but adds phase reversal switch which offers a spatial awareness that moves signals around in your head to give perceived placement of signals between the two acoustic headphone chambers.

Pro-Set-6 Elite £179.95 C
Pro-Set-6 Elite IC £189.95 C
AD-1 Rig adaptor leads £22.95 C

NEW Mic Stands

Our new range of stands offer you the convenience of hands free base operation. Choose the conventional desk model or the Goose neck "boom" model that keeps your desk area clear.

K-701 Gooseneck Stand £14.95 C
K-901 Desk Stand £29.95 C

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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

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

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

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

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

RadCom is published by the Radio Society of Great Britain as its official journal and is sent free and post paid to all members of the Society. **The next edition of *RadCom* is expected to arrive with most members by 26 September, although this can take up to a week longer in some cases; international deliveries can take longer still.**

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

RSGB MEMBERSHIP
– Annual Rates from 1 January 2011

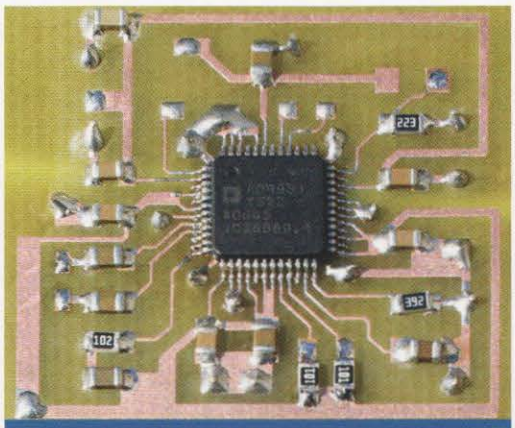
Full membership £51.00
(individual & club)
Family membership £60.00
Paying by Direct Debit saves £4 on the rates above.
Student (21-25) . . . . . Free
Ham Club (under 21) . . . . . Free

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

The RSGB SSB Field Day takes place on 3 and 4 September. Details in Sport Radio, P72.

Photo: Joan Canals, EA3AKP.

News and Reports



Homebrew HF DDS VFO – P20

Reviews

Features

VE3EJ excels in the Commonwealth Contest – P14

Technical Features

Regulars

Mechanical construction details of the PICaYAGI – P64

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.

Acting General Manager:
Don Beattie, G3BJ
Honorary Company Secretary:
Rupert Thorogood, G3KKT
Honorary Treasurer:
Dr R Dingle, G0OCB

BOARD OF THE SOCIETY
PRESIDENT
Dave Wilson, M0OBW

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

REGIONAL MANAGERS
L Paget, GM0ONX - Region 1
D Morrison, GM1BAN - Region 2
K A Wilson, M1CNY - Region 3
H Scrivens, G0UGE - Region 4
Vaughan Ravenscroft, M0VRR - Region 5
M Harper, MW1MDH - Region 6
J Sneddon, MW0EQL - Region 7
P Lowrie, MI5JYK - Region 8
A Johnston, G8ROG - Region 9
G Keegan, G6DGK - Region 10
P Helliwell, G7SME - Region 11
Mark Sanderson, M0IEO - Region 12
J Stevenson, G0EJQ - Region 13

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

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

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

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

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

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

Creating the New RSGB

As the acting GM said in his July editorial, "this is the first in what the President and I plan to be a series of article about creating the new RSGB" – well now it's my turn as President to give you an insight into what's happening.

In his July editorial Don described various issues facing the Society and in his second editorial in the series in August went on to describe the makeup and the role of the Advisory Group, the group of external business people who are working with us to shape the future strategy. I'm pleased to say that the Advisory Group duly met in late July and started work on the huge task that it had been set. I'd just like to take a few moments if I may to formally thank each and every member of the Advisory Group for taking up the challenge, giving their valuable time to this work and, most importantly, for looking at the issues that face us with new eyes.

During that meeting, held over a full weekend, there was, encouragingly, agreement on a significant number of matters and, not surprisingly, some disagreement on others but I'm pleased to say the former heavily outweighed the latter. The thing that struck me was that the five new pairs of eyes around the table confirmed our view that there is no one silver bullet that is going to solve all our problems. This is somewhat heartening because to me it means that those of us that had been looking at new initiatives etc hadn't necessarily missed something obvious. While we didn't manage to find that silver bullet, we did manage to coax to the surface lots of gems which as a group we were keen to develop.

Anyway that was the start of the process or, more correctly, the second step along the way. In order to hit the ground running, the Group had, in the days leading up to the meeting, each been given around 30 documents, including the survey to which many of you contributed, amounting to some 300 plus pages of information and data for each one to absorb and digest prior to the face to face meeting. The third phase, after the face to face, was to take those ideas we'd discussed over the weekend and form them into a document we could all refer to easily. Thanks to John Gould and Don for doing that. Using this document we could then see the different work packages that we each needed to progress, which included some fundamental topics such as ethos, governance, the web and marketing and some of the usual issues you'd expect such as membership recruitment, the licence and examination structure, and one or two new ideas, of which more in due course. As I write this, that work has been going on for a couple of weeks now with each member of the Group taking on a specific package and, using another nominated member of the Group as a sounding board, producing a scoping document for further discussion within the Group. Because of their background and interests some of those topics fell naturally to certain members of the Group while others fell less naturally – once again thanks to everyone for taking their share.

Those initial papers should all be completed by the time you read this and as a Group we should be well on the way to consolidating them into a document to present to the Board at our September meeting. Following formal review by the Board, the next phase will kick in – a more detailed cost/benefit analysis, project planning as well as due diligence prior to starting implementation.

Whatever the Advisory Group's recommendations are, whatever the Board approves, we will be coming to you, the membership, for your views – after all it is your Society. Depending on just what the final proposals are, it might mean calling an EGM. Whatever is finally required, you can rest assured that you, the membership, will have the opportunity to comment and, if our Memorandum and Articles require it, vote on any proposals.

Elsewhere in this issue you'll see the half-year results together with a short commentary. Cost cutting is mentioned – hopefully the cost cutting that has been going on over the past few months has been coupled with a greater responsiveness and improved service from Headquarters. I know that is what Don is trying to achieve. There's still a long way to go on our financial performance, but the 2011 forecast looks reasonable as long as we don't take our eye off the ball and the world economy doesn't go into free fall!

Please keep your comments about our membership service coming through the 'Have Your Say' route (www.rsgb.org.uk/haveyoursay). If you have any ideas for the future, don't keep them to yourself – let us know about them, share them with us. We're looking for any and all inputs to help shape the future.

I know Don has been very heartened by the huge number of comments he has received and particularly by the encouragement he has received from many of you. At what we all recognise as being a difficult period in the Society's history we need the support of all our Members, and I know I can count on you to provide that.

Dave Wilson, M0OBW
RSGB President

RSGB Board Vacancies

Are you the right person to stand for election to the RSGB Board for 2012-2014?

Vacancies exist on the Board and on the Regional Council for the term 2012-2014 as follows: Board: three vacancies, Regional Council: seven vacancies.

REGIONAL COUNCIL. Regional Managers for the following Regions:

Region 3: Cumbria, Lancashire, Greater Manchester, Cheshire, Merseyside, Isle of Man
Region 6: Conwy, Denbighshire, Flintshire, Gwynedd, Wrexham, Ynys Môn (Isle of Anglesey)
Region 7: Ceredigion, Carmarthenshire, West Glamorgan, Pembrokeshire, Swansea, Mid Glamorgan, East Glamorgan, Cardiff, Monmouthshire, Newport
Region 10: Oxfordshire, Wiltshire, E & W Sussex, Hampshire, Isle of Wight
Region 11: Cornwall, Devon, Somerset & Bristol, Dorset, Channel Islands
Region 12: Cambridgeshire, Norfolk, Essex, Kent, Suffolk
Region 13: Leicestershire & Rutland, Derbyshire, Nottinghamshire, Lincolnshire

BOARD VACANCIES. Whilst any member may seek nomination to stand for election to the Board, if you are an active amateur, have good experience of business management and the time to commit to a demanding role, your skills would be particularly valuable. The RSGB needs a strong Board and so candidates of the highest calibre are encouraged to put themselves forward.

There are three vacancies on the Board for 2012-2014, although two existing Board members will be standing for election, having been co-opted for 2011.

Those retiring and not available for re-election have responsibility for the Education & Amateur Radio Development portfolio and Technical portfolio. Those standing for re-election currently hold the Business Management portfolio and Public Services portfolio. Under our current rules candidates for election to the Board do not stand against specific portfolios, but if elected are required to accept the portfolio offered to them by the President. The portfolios that are becoming vacant should therefore be seen as a guide to those needed in the Board due to the vacancies for 2012.

REGIONAL MANAGEMENT VACANCIES. Candidates for the Regional vacancies must be resident in the Region concerned, and be nominated by Corporate Members resident in that Region. All retiring Regional Managers are available for re-election.

HOW TO APPLY. If you wish to seek nomination please email GM.dept@rsgb.org.uk for the nomination papers. Completed nomination papers, with supporting signatures of ten RSGB Corporate Members (for a Board nomination) or five Corporate Members (for a Regional nomination), must reach RSGB Headquarters by 1 October latest.

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

The list of candidates seeking nomination will be published in the November *RadCom* and a ballot held during that month.

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 W Cragg	G2HDU

60 years

Mr A R Cooke	G3IFX

50 years

Mr D F Beattie	G3BJ
Mr M A Birch	G3KMO
Mr A J Baker	G3PFM
Mr P Blakeborough	G3PYB
Dr J S J Craig	G3SGR
Mr H R Skelhorn	G8BPU

G5RP Trophy

The G5RP trophy being presented at the 2009 RSGB Convention.

The G5RP Trophy is an annual award to encourage newcomers to HF DXing. However, the award is not limited to youngsters or the newly-licensed: the HF DX bug can bite at any age or after many years of experience on other bands. If you are an established HF DXer and want to recommend someone to be awarded the G5RP Trophy for 2011, now is the time to send in your nomination. Your nominee should be an up-and-coming HF DXer who has made rapid progress in the last year and has some real achievements to show, for example, a good total of new countries worked or some serious HF DXpedition activity.

This prestigious award will be presented this year at the RSGB Convention on 7 - 9 October. Please send your nominations to Ian Greenshields, G4FSU, QTHR, or by e-mail to ian.greenshields@gmail.com to arrive no later than Friday 23 September.

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 E Vaughan, 2E0CFM
Mr M Langham, 2E0HDW
Mr S Balme, G0GVB
Mr NKW Rogers, G0JZF
Mr J Sparkes, G0SDT
Mr M Edwards, G4BZM
Mr G Belt, G4ZPO
Mr B Omidi, G7KUF
Mr T J Lawson, G8JID
Mr LGS Challis, G8SKG
Mr G Robb, GM8KXF
Mr J R Upson, K3JRU
Mr G A Larsen, LA2BSA
Mr R Card, M0ZZY
Mr D Ball, M1BCB
Mr R M Easthope, M1DUO
Mr R Griffiths, M3UEC
Mr PDR Butler, M6AOL
Mr P Dickson, M6AVP
Mr T S Winter, M6AXG
Mr A Sharam, M6AYL
Mr B Jedryka, M6JBL
Mr P Crossley, M6JPC
Mr M E Lowin, M6MOK
Mr P J Mullen, M6PMJ
Mr R Fox, M6RDO
Mr S W Bradley, M6SRE
Mr T J Taylor, M6TPT
Mr B Waymark, M6WAY
Mr B Weller, M6WHO
Mr J Hancock, M6WMV
Mr M Meagher, MI6ZTM
Mrs P Harrison, MW3WPH
Sherwood ARC, MX0GZD
Mr O S Alonso, N6PAZ
Mr B McCarthy, NX9O
Mr J Callaghan, RS185093
Mr K Jones, RS208582
Mr C A Ralph, RS208602
Mr A Stewart, RS208604
Harrassowitz GmbH & Co. KG, RS208621
Mr P Kenny, RS208630
Mr M J Blaymire, RS208631
Mr M Bell, RS208646
Mr R Povey, RS208662
Mr G Clark, RS208673
Mr S Tomsett, RS208674
Mr S Harrison, RS208675
Mr A Smart, S208683
Mr P Chamberlain, RS208692
Mr P Muir, RS208699
Mr D Simpson, RS208721
Mr K Strom, VA3KRS
Mr K Schache, VK5KS
Dr J Farmer, VK7JB
Mr T L Thompson, W0IVJ
Mr J F Ballester, WP3HW

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

Mr SC Preston, 2E0BHY
Mr G Finney, 2E0TPP
Mr F McGavin, EI4GMB
Mr R J Weedon, G0IWW
Mr M A Pivac, G0JML
Mr A Walker, G0WDA
Mr PAD Manning, G1LKJ
Mr A J Goatman, G1SEW
Mr NSR Semmens, G3PUQ
Mr F L Curtis, G3SVK
Mr N Kenyon, G4AYU
Mr S Dixon, G4IYK
Mr S P Ward, G4MVL
Mr R S Coombes, G4ZEJ
Mr T W Hurton, G6SJG
Mr I M Oxley, G7EJO
Mr A E Roberts, G7EMD
Dr A Thores, GM4JKT
Mr T G Ditchfield, M0CEC
Mr R Laight, M0PML
Mr IW Swindells, M0SWZ
Mr AKA Kerr, M1BWS
Mr A Pickersgill, M3ESG
Mr W Jepson, MW0BLU
Mr BAB Boggs, NV8I
Mr A Glinski, VK5ALX
Mr P Saville, ZL3IN

Club of the Year

Region 8 winners, Lough Erne ARC, were also placed 2nd in the National competition, sponsored by Waters and Stanton. The club has run both Foundation and Intermediate exam courses and welcomed 26 new Foundation licensees to the club, the youngest being Gemma, MI6GDM, aged 12. In 2010 the club ran two main special event stations. In May, they set up GB2MAC at Marble Arch Caves for the international Geoparks Communication event. Six operators logged 51 QSOs with 15 countries in Europe Asiatic Russia, Cuba and Argentina. Then, in October, Lisnaskea Scouts hosted the club station GI0LEC for Fermanagh's first JOTA. A total of 16 QSOs were logged with other Scouts, enough to rouse enthusiasm for a full 2011 event.

Long dormant, the club callsign GI0LEC was re-activated for January's IRTS 80m Counties Contest. The aim was a refreshed identity for Club and County. This was the first event in the innovative 2010 programme of activities drawn up the Committee. Using Herbie, GI6JPO's QTH, rig and antenna, results showed the main operator Alan, GI6PYP scoring 19th in 32 SSB fixed log entries with 43 QSOs and 22 Counties. Fermanagh and its club thus featured among the 31 counties put on-air by about 50 operators.

Mentoring is a key element in the club's strategy to recruit, retain and advance newly licensed members. Mentors first helped Foundation members at the courses, then afterwards with stations, rigs, antennas etc. The club has found that the GB3CP repeater is much used, continuing course friendships and keeping those new licensees on the air. Over 30 members, most new licensees, helped at the rally in 2010. Three of seven people on the new committee are newly licensed, which shows the club's commitment to encouraging new amateurs. The club has reaped a rich harvest from new licensees.

New young radio amateurs, brother and sister, Jamie, MI6NU, age 16, and Gemma, MI6GDM, age 13, operating an LEARC club station – supervised.

On a sunny May weekend, Ivan, GI8WJN, operating LEARC's International Geopark station, GB2MAC, at Marble Arch Caves in a caravan, with Stephen, GI7UIM.

QSL Matters

DISPATCHES. A busy July and August saw us sending over 150kg to Austria, Belgium, Denmark, France, Germany, Hungary, Italy, Japan, Norway, Poland, Portugal, Romania and Spain. Smaller packages going to a number of others included Andorra, Aruba, Canada, India, Lithuania, Liechtenstein, Netherlands Antilles, Turkey and Venezuela. Even the smallest of our 116 UK sub groups received at least two deliveries in the half year and the next round has just started, which should take UK cards past the half million mark.

PROOF OF MEMBERSHIP. Please send us proof of membership when you send in your cards as this saves us a lot of time. Save your *RadCom* wrapper – if it's just gone in the bin you may be able to retrieve it! You just need to send the address label portion of the wrapper with your QSL cards. To us, sort time is extremely precious and many more cards could be sorted if we're not chasing membership details.

SUB MANAGERS – CLEAR OUT. Volunteers have reported that the big sort out of old and undervalue stamped envelopes has been a rewarding experience. Busy volunteer, MOM-Z manager Wayne, MOWAY has gone further, contacting all his users and searching through envelopes that pre-date his time with the bureau service, resulting in some interesting finds. Well done Wayne! He's made an excellent suggestion. Once per year, managers should despatch all part filled envelopes regardless of card numbers. The convention has always been (unless the envelope has 'send any' written next to the envelope number) to wait for the stamp value limit to be met. We think it would help to cut card delays and reduce the numbers held by managers. Wayne suggested July each year but maybe the first despatch of the year would be better to beat the seemingly annual Post Office price increases in April. We will be recommending this idea to the Board.

Operating in Turkey?

The Society has recently been asked to help in an emergency concerning a member whose equipment was impounded by Turkish authorities whilst he was operating on holiday. Although Turkey is a signatory to CEPT, it seems that the concept of a 'lifetime licence' may not be understood by all the relevant agencies in Turkey. The member concerned ended up in a Turkish court and it was only by active intervention of the RSGB, TRAC (the Turkish Society) and support from Ofcom, that the situation was recovered.

Members planning to operate from Turkey under CEPT T/R 61-01 must ensure that they have their full licence – both Section 1 and Section 2 – with them at all times. We also suggest that they have a note of the RSGB telephone number in case of difficulty!

Note should be taken of clause 4(1) of Section 2 of the licence documentation, which clearly states that the licence has no expiry date. It was this concept that appears to have caused some difficulty in Turkey.

The Society will be reviewing with Ofcom whether further clarification is needed in licence documentation.

RSGB Continues to Argue for Common Sense on PLAs

The RSGB is making input through BSI to the process of developing a European standard for in-house powerline telecommunications adaptors (PLAs). The Society has been closely involved in the discussions on possible standards for powerline telecommmunications devices over many years and remains very concerned at the direction that the standardisation process is taking, and the lack of protection it proposes to give to the HF spectrum generally.

The Society believes that the proposed draft standard does not adequately protect radio services and would result in products that fail to meet the essential requirements of the EMC Directive. The Society remains extremely concerned that commercial interests could result in existing standards being set aside in the interests of political expedience.

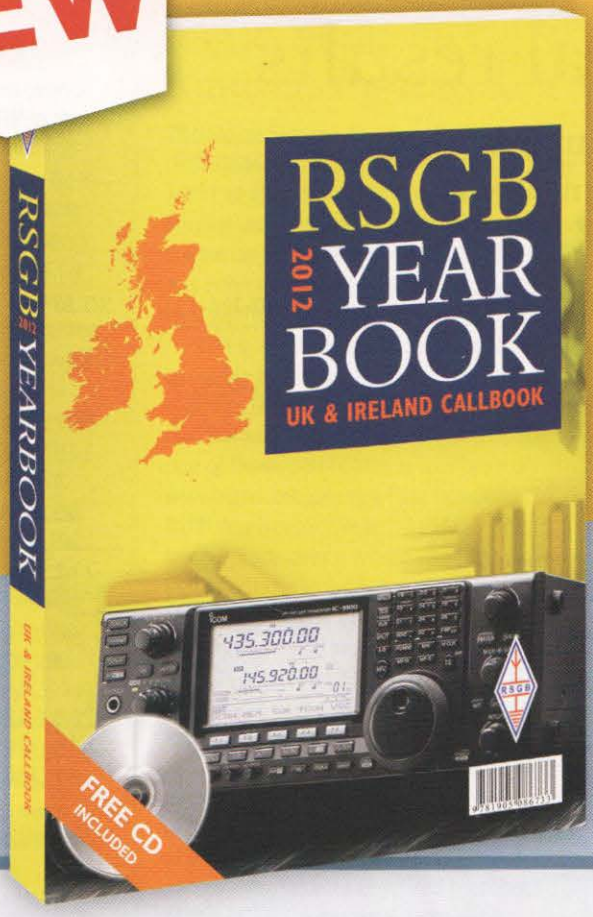
For more information see www.rsgb.org/emc/the-rsgb-and-ofcom.php.

Forthcoming Meetings

9/10 September: Board Meeting
10 September: National Council Meeting
14 October: Management Committee Meeting

If you want to comment on any issues, please do so via the website (www.rsgb.org.uk/haveyoursay) or to the Acting General Manager and President by e-mail to haveyoursay@rsgb.org.uk.

NEW



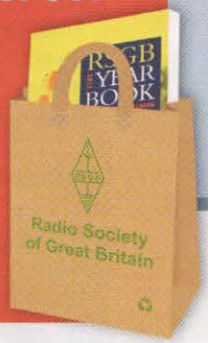
RSGB shop

Official Launch at the NH National Hamfest

31st Sept 1st Oct

FREE goodie bag

For the first 100 customers per day who purchase a copy at the show



RSGB Yearbook 2012

from £16.99

Edited by Steve White, G3ZVW

NOW reformatted for easier use!

With around 70,000 amateur radio licences on issue, the *RSGB Yearbook 2012* is the essential guide to these and amateur radio matters in the UK and worldwide. In a new format for easier use, the *RSGB Yearbook 2012* provides a comprehensive guide to UK and Irish Callsigns sorted in a wide variety of ways. Nearly 200 additional pages of the very latest amateur radio information make this book the indispensable guide for every amateur.

The *RSGB Yearbook 2012* provides the very latest callsign data now sorted into those who release their personal details for amateur radio purposes and those who don't. The callsign data is then sorted further into postcode or surname formats. There are also listings of special contest callsigns, permanent special event callsigns and those in the Republic of Ireland.

The *RSGB Yearbook 2012* is much more than the latest update of these callsigns. Repeaters, band plans, contests, awards, propagation, operating abroad and much more is covered here. You will find all manner of local information organised into regions so you can find local clubs, trainers and examination centres in the area alongside details of the RSGB Regional Manager Team. There are details of how the Society is organised, the services it offers, committees, who to contact for assistance, etc. There are a wide range of features covering National Affiliated Societies, Local Clubs and a even special feature looking at 2012 with the Olympics and Queen's Jubilee.

FREE CD - Some buy this book for the CD alone. Not only do you get all of the information pages of the yearbook in a fully searchable format, you also get loads of bonus material. This CD contains over 600MB of bonus material. There are sample chapters from RSGB books, masses of amateur radio software, extra club information and more, all in an easily accessed format.

If you want THE guide to amateur radio in the UK, the *RSGB Yearbook 2012* is the book for you.

Size 210x297mm, 528 pages, ISBN 9781-9050-8673-3

Features:

- Around 70,000 UK callsigns
- Irish callsigns
- Callsigns sorted by name and postcode
- Licensing Information UK and International
- A full colour Review of the Year
- National and Featured Club Information
- Exam Licence and Course Information
- Prefix Lists
- Latest Band Plans
- Award and Contest Information
- Technical Help
- and much more

Non Members' Price £19.99

RSGB Members' Price £16.99

POST & PACKAGING FREE FROM

See page 76 for full details

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

E&OE **All prices shown plus p&p**

Radio Society of Great Britain

www.rsgbshop.org

RSGB financial results

Unaudited Income & Expenditure Account for the six months ended 30 June 2011

	30-Jun-11	30-Jun-11	30-Jun-10	30-Jun-10
Income				
Subscriptions	425,757		429,979	
RadCom Advertising	82,179	507,936	82,609	512,588
Books and Products for Resale		145,492		144,702
Sponsorship		3,583		4,250
Other Services - inc Exam Services		55,649		52,932
Total Income		712,660		714,472
Contribution from Subscriptions, *RadCom*, Publication and Services				
Subscriptions net of *RadCom* Publication Costs	324,918		320,679	
Amateur Radio Costs, net of Income, Sponsorship & Exams	(52,295)		(67,093)	
GB4FUN, net of Sponsorship	(6,981)	265,642	(8,887)	244,699
Books and Products for Resale		46,026		38,991
Other Services net of expenses		7,024		5,743
Total Contribution from Activities		318,692		289,433
Less Non Activity Specific Overheads				
Commercial Costs		(63,617)		(60,917)
Bletchley Park		(6,773)		(1,182)
Administration		(177,078)		(183,968)
Personnel Costs		(4,950)		(3,352)
Office Costs		(79,251)		(43,530)
Landlord Costs		(11,738)		(11,120)
Net Surplus/(Deficit) from Activities		(24,715)		(14,636)
Interest Income		4,913		7,800
PLT donations less legal fees		144		2,653
Deficit		(19,658)		(4,183)

At the 30 June 2011 the net deficit was £19,658 compared to a net deficit of £4,183 in 2010.

Mindful that Members are facing the same economic pressures as the Society and subscriptions were increased reluctantly in January, a programme of cost cutting has been taking place. This has been fairly successful with the concentration on areas that do not affect membership services. Savings have been identified in the printing and postage costs of *RadCom* and the dispatch and carriage costs of books. Board and Committee costs are currently lower than the previous half year and although there is a lot of activity planned for the remainder of the year, volunteers are being encouraged to be more cost conscious. The headcount is lower by 1.5 for Administration and the position for the General Manager remains vacant. However, against these savings are offset the additional first half year legal costs and other professional fees relating to the issues surrounding the previous General Manager.

The National Radio Centre is nearing completion and at the end of June costs of £6,773 have been incurred in related operational expenses. It is planned that the centre will open in January 2012.

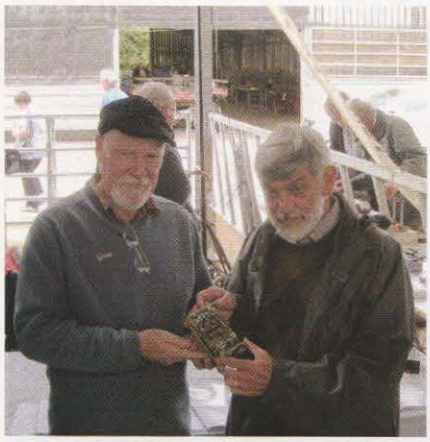
Donations are still being received for the Spectrum Defence Fund, for which the Society is very grateful. The sum of £144 shown relates to the balance of spend due to the Society from the SDF for the original legal advice sought on the PLA/PLT issue. At the end of June a balance of £2,396, representing the donations received in excess of legal costs, is being treated as a Restricted Fund.

The savings achieved and the resulting lower cost run-rate for the second half of the year, mean that the result for the end of the year is expected to be break even or better.

QRP in the Country

In July, hundreds of people from all over England and Holland attended QRP in the Country in Somerset. About 25 stalls and displays showed off or sold everything from components to large construction projects. Apart from a few traders selling components, most displays were from clubs publicising their activities or of ancient domestic and wartime radios, with a few individuals selling items to make space for new projects! There were also practical construction projects to be seen as 'students' built their Cary RXs with occasional help from the Bath Buildathon team led by Steve, G0FUW.

A raffle raised £200 for those suffering in East Africa. A year's subscription to *PW* kindly donated by Rob, G3XFD was won by Graham, G4DPH. George, G3RJV was asked to select a couple of displays for two other prizes. The G QRP Club had kindly donated a special edition of Drew, VK3XU's latest project book that was also won by G4DPH for his *PW* Sprat project; a Walford Electronics Radlet CW TCVR kit went to Colin, G3YHU for his valved superhet. A year's subscription to BYLARA was won by SWL Mike Jones who is about to take his Foundation licence course.



George, G3RJV presenting the prize to Graham, G4DPH.

Heil Microphone

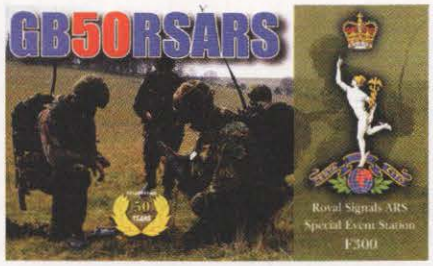
The new HM-12 microphone is designed specifically for amateur radio communications. The element exhibits nearly –35dB of rear rejection, which reduces background and ambient noise from the transmitted signal and an audio response from 80Hz – 14kHz. The manufacturers say that the +4dB peak centred at 2kHz gives the HM-12 excellent voice articulation balanced with clean, clear low-end response, producing a high quality AM, FM or SSB signal. The 'soft touch' PTT switch is wired to pins 3 and 4 of the 4 pin XLR for transmitter control with the microphone signal fed to pins 1 and 2. The Heil HM-12 costs £69.95 from the main importers, Waters & Stanton (www.wsplc.com).

RSARS 50th Anniversary Year

The Royal Signals Amateur Radio Society (RSARS) was officially formed on 23 June 1961 at Blandford and to celebrate their Jubilee year a one-year special event station started on 18 June. The callsign GB50RSARS has been allocated by Ofcom and will be run by a number of volunteer RSARS operators.

There are three certificate levels available for working a number of different member stations and full details of how to find the special event station and obtain one of these certificates is available on www.rsars.org.uk under the heading RSARS 50th Anniversary Year 2011/12. This is taking place over a whole year, so you have plenty of time to work the requisite number of stations for the three different grades. There are two other stations that you need to work for the awards – G4RS and G3CIO. Details are also available under the callsign listings on www.qrz.com.

Membership of RSARS is available to all serving and former serving members of the Royal Signals and other branches of the Army, MoD (Army) including civilian employees, serving or retired members of the ACF/CCF or University Officer Training Corps, serving or retired members of Commonwealth Forces and members of NATO Forces who have worked in close liaison with Royal Signals, subject to approval. Anyone interested in joining should contact the Membership Secretary in the first instance; details can be found at www.rsars.org.uk.



Equipment Exchange

Mold and District Amateur Radio Club has organised a silent key, shack surplus, bring and buy, junk swap and sell evening to be held at 8pm in the Mold Rugby Club Mold in Flintshire North Wales on Wednesday 14 September. What they hope makes this sale a little different is the quality of some of the silent key items in the sale, which includes an Elecraft K3. There is also no charge for private sellers. Please contact Steve, GW7AAV on 01244 819618 or e-mail gw7aav@gmail.com (correct on QRZ.com) in advance for a table reservation. More details at www.madarc.org.uk.

Telford HamFest

The annual Telford HamFest will take place on 4 September and the organisers have found an excellent speaker to add interest to the usual trade and exhibitor stands. Roger Stafford, G4ROJ will give two presentations (at 11am and 1pm) in the gallery next to the rally area. His talk focuses on using kites as antenna supports, as well as balloons and aerostats. He will be bringing a range of kites along and hopes, weather and space permitting, to practically demonstrate one or two of his favourites on ground adjacent to the HamFest site. The photo shows a 'combo' aerostat, nicknamed The UFO, but most of his 'sky hooks' are somewhat less fanciful! The Bring & Buy stall is always popular and this year Telford Club has obtained a vast number of brand new, boxed radio valves that should keep the vintage wireless aficionados happy. Further information is available at www.telfordhamfest.co.uk.

Antennas & Baluns

Nevada is stocking a new range of baluns with ratios of 4:1, 1:1 and 6:1. They use PTFE wire wound in a Teflon sleeve, on a K core, potted in resin. A Teflon SO239 socket ensures low losses. Each balun is supplied with its own RF sweep plot to show HF performance and comes with a 2 year warranty.

The company will also use these baluns as the heart of a series of military grade Windom antennas, using Kevlar wire and the finest connectors, to be released shortly.

The baluns start at £59.95 with antennas to match and available from Nevada, www.nevadaradio.co.uk.

Antenna Dealers

MOCVO Antennas has announced that they have two new dealers - HamWorld UK, who are based in Wales and Delta Mike Electronics based in Siracusa, Italy. Further details may be found at www.m0cvoantennas.co.uk.

National Trust on the Air

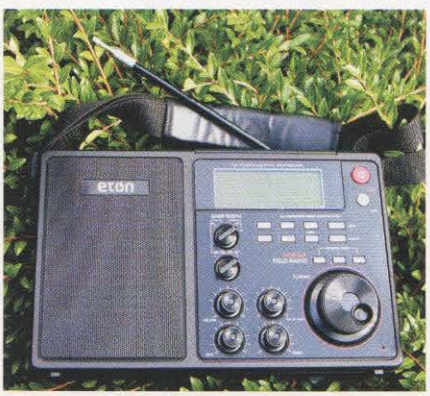
10 September is the day to listen out for special event station GB2AC on the air from the Appledore ARC station, Arlington Court in North Devon.

Antenna Analyser

Waters & Stanton have been appointed the UK distributors for a new antenna analyser that will be available in late summer. Called the YouKits FG-01, it covers 1-60MHz and has a colour LCD display that shows both absolute measurement values and also a graphic display. The scan width of the display is adjustable and the unit will have a built-in battery. Provisional price is £219 inc VAT.

Eton S450DLX Field Radio

The Eton S450DLX Field Radio covers from 530kHz to 30MHz and the broadcast VHF FM band. With a 5 inch speaker, sound quality on broadcast stations is excellent, whilst wide & narrow filters plus variable tune rates ensure easy tuning and interference rejection. The radio will sell for £99.95 and be available from Nevada, www.nevadaradio.co.uk.



28MHz all-mode transceiver

The new ML-5555mk11 from Martin Lynch & Sons is an enhanced version of the AT-5555 28-30MHz all mode transceiver from AnyTone. It could be ideal for working DX on FM & SSB/CW now the 10m band has 'woken up'. It is simple to use and covers the entire 28MHz band and is supplied with remote speaker mic, DC lead and manual. Costing £149.95, more details can be found at www.hamradio.co.uk.

ARISSat-1 Deployed

ARISSat-1 has been deployed from the International Space Station and its 145.950MHz FM/SSTV and 145.920MHz BPSK signals have been received around the world. Pictures of the deployment can be found at www.flickr.com/photos/valkyries1/6005117203/in/set-72157627223306577. Online satellite pass predictions are available from the AMSAT website, just select ARISSat-1 at www.amsat.org/amsat-new/tools/predict.

New Network Analyser

The new DG8SAQ VNWA3 vector network analyser covers 1Hz to 1.3GHz and operates from a single USB connection. Functions include full S-parameters (S11, S12, S21 & S22, VSWR, Smith chart), time domain (distance to fault) measurement, basic signal generator and even a spectrum analyser to 100MHz. Costing around £400 for the basic model, full details can be found online at www.sdr-kits.net. The VNWA3 will be reviewed in a future edition of *RadCom*.

CHOTA

On Saturday 10 September it's Churches and Chapels on the Air, which will take place between 10am and 4pm. Callsigns already registered include GB0BRE, GB0DRI, GB0LOW, GB1MSN, GB1OOD, GB2ANG, GB2BOH, GB2SPW and GB4SJH. Most activity will be on 80 and 40m SSB. If you are putting your church or chapel on the air please tell John, G3XYF via g3xyf@btconnect.com.

PIC-A-Star Constructors

Pic-A-Star is an SDR radio designed by Peter Rhodes, G3XJP that was serialised in *RadCom* and also appears in the RSGB *Radio Communication Handbook*. Milton Keynes ARS, in conjunction with the Milton Keynes Museum, are inviting all constructors of Pic-A-Star to a one-day get-together on Sunday 11 September from 11am to 4pm at the Milton Keynes Museum. Constructors of the Pic-A-Star project are welcome to bring their radios to the Milton Keynes Museum for a gathering and exchange of ideas (Star add on circuits welcome). There will be test equipment and an antenna available on the day. Entry will be free, but it would be nice to leave a small donation to the Museum. Further details and directions are available on www.radio-kits.co.uk/pic_a_star/event.htm.

McMichael Radio Rally Winner

Another successful, if not slightly damp, McMichael Rally was held at Reading Rugby Football Club. The main raffle prize of a brand new Yaesu FT-450D HF/6m base transceiver was kindly donated by Yaesu UK & ML&S. It was won by new licensee Emlyn, M6ETP. Emlyn has only had his callsign for seven months and just a few hours before purchased his first ever transceiver, an FT-817ND from ML&S – only to win the FT-450D in the raffle! The next McMichael rally will be held at the Rugby Ground near Sonning in Reading on Sunday 15 July. Details at www.mcmichaelrally.org.uk.

Emlyn, M6ETP and Richard, G1GRD, UK Sales Manager, ML&S.

Twinned Clubs

Several radio clubs in the UK are twinned with other amateur radio clubs around the world. Bill Laakkonen, N4BKT attends the Stuart Florida Ham Radio Club, who organise the Florida hamfest. That takes place in March each year when up to 1500 people attend. The club is interested in twinning with an amateur radio club in the UK. Why not e-mail Bill for details? worldradiolabs@gmail.com.

NEW

RSGB shop

RSGB Deluxe Log Book & Diary 2012

from £4.24

The smart choice in logbooks!

If you want more at your fingertips than somewhere to note your QSLs, *RSGB Deluxe Log Book & Diary 2012* provides it. This popular logbook contains a wealth of reference information including the very latest UK band plans, DXCC prefix list, RSGB QSL Bureau information, a locator map (and an explanation of how locators work), repeaters – pretty much everything you need to know right at your fingertips. And of course it has a generous amateur radio station log section, so you can neatly record a whole year of activity and store it in attractive way for years to come.

The RSGB Deluxe Log Book & Diary 2012 includes:

- Current UK band plans
- European locator map
- Prefix guide
- Repeater listings
- QSL bureau information
- Generous Log section
- 2012 Diary
- Handy lists of abbreviations & codes
- And much more

If you want all this at your fingertips when you need it, the *RSGB Deluxe Log Book & Diary 2012* is the smart choice for those wanting more from their logbook.

MUCH more than a standard logbook yet at the same price!

Official Launch at the NH National Hamfest

31st Sept- 1st Oct
Pick up your copies at the show!

Non Members' Price £4.99
RSGB Members' Price £4.24

Callseeker Plus 2012

from £13.59

Cheaper than a RSGB Yearbook and with more callsigns!

For those who want the convenience of an instant search call book that not only covers the UK but Europe as well, that is *Callseeker Plus!*

Like the *RSGB Yearbook*, the *Callseeker Plus 2012* CD contains the most up-to-date listings of United Kingdom and Republic of Ireland amateurs' callsigns but you will also find comprehensive coverage of callsigns from across Europe. Provided in a user friendly format that takes no hard disc space, this CD is the ideal way to search for European QSLs. The software runs straight from the CD so you can search by callsign, name or location. Navigating through the search results is quick and easy and you can print the results in a variety of formats including straight to an address label. Users will also find callsigns from 9A, DL, EA, ES, F, HA, HB9, I, LX, LY, OE, OH, ON, OZ, SM, SP, SV and Z3.

Callseeker Plus 2012 also provides much more. The nearly 200 pages of the information section from the *RSGB Yearbook* are included in an easily searchable PDF. *Callseeker Plus* boasts a host of "extras" from across Europe, including hundreds of Mega Bytes of useful amateur radio software (list available on the website).

Callseeker Plus 2012 is a must for every radio amateur who wants to search for callsigns in an economical way and get lost of bonus material too!

Non Members' Price £15.99 **RSGB Members' Price £13.59**

POST & PACKAGING FREE from £14.01
See page 76 for full details

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

Radio Society of Great Britain
www.rsgbshop.org

74th Commonwealth Contest 2011

John, VE3EJ, in his well equipped shack.

COMMONWEALTH CONTEST. The hoped-for better conditions, promised by the state of the bands in CQWW the week before, failed to materialise for the 2011 Commonwealth Contest. High noise levels and lack of HF openings were the order of the day and this is reflected in the reduced number of entrants, compared with 2010, and in their soap-box comments.

In the week before the contest, HF conditions were just amazing and everyone was hoping for excellent propagation on 15 and 10m. Unfortunately a sudden solar event almost killed 10m propagation except for north-south paths, Canada to the Caribbean was pretty good at times and even from the Caribbean to VP8. The disappointing conditions must have been one factor in the reduced entry. Participation was down in the Open Section, by UK stations in particular and elsewhere in VK/ZL. The VU Team was decimated as a result of a major DXpedition in which most of the leading lights were involved. VU2PTT decided to act as HQ station, which was a good call. They should all be back in 2012. We must hope for better propagation too.

The graph shows the pattern of propagation from the Caribbean to the UK (tnx J88DR, VP2V/G3PHO, 8P6DR, J68PJ and VP2MXF).

OPEN SECTION. With a score of 10595 from 883 QSOs, John, VE3EJ, strengthened his grip on the Senior Rose Bowl with another convincing win in the Open section. John had a big lead over fellow Canadian, Ron, XL3A, (8645, 729 QSOs). John's ability to wring more bonuses out of the bands accounts for much of his success over the years. He managed 309 to Ron's 250. Of the top 10 places, no fewer than 5 went to VE stations. Canada really pulled out all the stops this year.

In 3rd place with 8440 from 744 QSOs is DX traveller extraordinaire, Nigel, G3TXF, operating from the Gingerbread Hill Villa as VP2MXF. Alan, P3J, was 4th (8140 from 884 QSOs) and Dave, J88DR, 5th (7805 from 629 QSOs). Again, the leading UK station was Gerry, GI0RTN, operating G6PZ, in 12th place (6120 from 320 QSOs). He thus retains the Col Thomas Rose Bowl. Leading VK station was Barry, VK2BJ, in 11th place and the highest ZL station was Frank, ZL2BR in 31st place.

RESTRICTED SECTION. The Restricted Section again showed a small growth in numbers, underlying its growing popularity. It is becoming especially popular with the DX Travellers who took 5 of the top 10 places.

Overall winner of the Junior Rose Bowl by a good margin was Yuri, 8P9AA (VE3DZ). Yuri ran 100 watts from a K3 to a 43' vertical fed via a 4:1 balun – a very simple set up. Yuri's score of 7900 from 608 QSOs would have placed him 5th in the Open Section! It just goes to show that the old adage 'location, location, location' really applies. Have a look at Yuri's comments on the Soapbox about unwanted callers – there were plenty of those this year!

With 7005 from 561 QSOs and in second place, was last year's winner, Bob, J68PJ, who used a similar set up, a K3 and 100 watts to a vertical doublet for HF and a sloper for LF from a site on the cliffs at the north end of St Lucia. Peter VP3V/G3PHO, was 3rd with 6560 from 588 QSOs. There are pictures on the BERU website and his Flickr site. Peter was followed by Richard, 8P6DR, in 4th (5995 from 467 QSOs).

In passing, it seems that a typical traveller station includes a 100W radio, the Elecraft K2 or K3 for example, with some sort of antenna tuner, key, cable, etc. For antennas, it was typically one of the large fishing poles about 10-12m or similar for an all band vertical or as a support for a doublet or fan dipole. Logging is usually done on one of the small laptops available these days. With a bit of judicious packing, all this will go as baggage, hand and hold, under most airline limits. Perhaps one of the DX travellers can be persuaded to write an article on some of the options or, if you are visiting the RSGB Convention this year, you may find Nick Henwood, G3RWF and his talk on Africa with two suitcases very interesting.

The highest placed UK station, Peter, G3LET, was 5th (4785 from 221 QSOs). Peter therefore wins the John Dunnington Trophy, being the highest placed UK station who has not won the trophy for the past two years. Antennas at G3LET were a BigglR and long wire skyhook. This 250ft invisible sloping wire antenna that is used on LF is supported by a 150ft sequoia and fed in the shack against 6 radials, each 40ft long, which are laid out in the direction of interest.

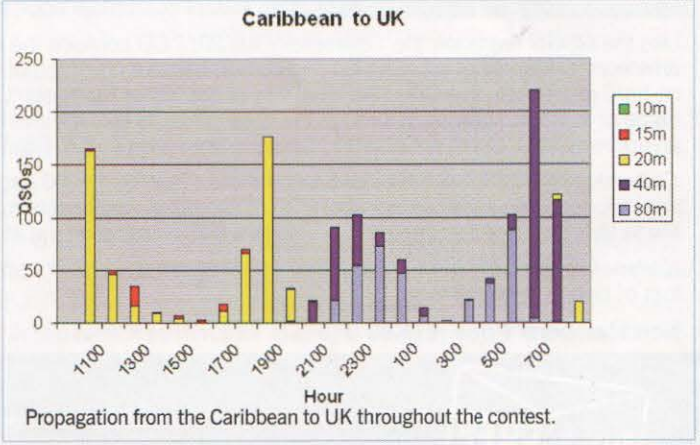
HQ STATIONS AND MULTI-OPERATOR. GB5CC, operated this year by Chris, GM3WOJ, from the GM2V contest station near Inverness, regains the leadership of the four HQ stations, GB5CC, VA3RAC, VE7RAC and VU2PTT that were active.

Nine stations entered the Multi-operator section, which was won by VE3RZ (6400 from 472 QSOs). With the advent of RBN/Skimmer as well as Cluster it is expected that this section will grow in the next few years.

12 HOUR AWARDS. The VP8GQ award for the highest placed non-UK station that operated for 12 hours goes to Mike, 5H3EE. The Ross Carey Rose Bowl goes to Bob, MD0CCE, as the highest placed UK station that operated for 12 hours.

QRP CERTIFICATE. The QRP entrants and scores were: G3LHJ (1600), VA3RKM (1575), VE5VA (860), VE7BQO (685), G3YMC (660), G5CL (375), GW0VSV and G6CSY (225), VK4TGL (200). Derrick, G3LHJ takes the honours this year.

COMMONWEALTH TRAVELLER AWARD. At least 10 entrants travelled to Commonwealth countries especially for the contest or were on DXpeditions at the time. This year the award is made to Peter, VP2V/G3PHO. This was



Propagation from the Caribbean to UK throughout the contest.

TEAM CONTEST

Pos	Team	Score	Members
1	Rest of the Commonwealth	65572	C4Z, J68PJ, J88DR, P3J, VP2MXF, VP2V/G3PHO, VP8NO, ZB2EO, ZC4LI, 8P6DR
2	Canada	63055	VO2AC, VE3EJ, VE3KI, VE3OI, VE3ZI, VE3KZ, VO1TA, VY2SS, XL3A
3	Australia	46508	VK2BJ, VK2IM, VK4BUI, VK4SN, VK4XY, VK6BN, VK6DXI, VK8AV
4	UK	45485	GOIVZ, G6MC, G3LET, G3WPH, G5LP, G6PZ, GM0GAV, GM3POI, G0KPW
5	Africa	36899	V51YJ, 5X1NH, 9J2BO, ZS1EL, ZS6KR, ZS6C, 5H3EE, 5N7M
6	Asia	6215	9M6/VO1AU, VU2UR

No entry from Team New Zealand this year and, of the others, only Team Rest of the Commonwealth managed to field all their registered players.

The VP2MXF QSL showing the site of many DX operations from Montserrat: the ham-friendly Gingerbread Hill guesthouse. Courtesy G3TXF.

Peter's first BERU DXpedition and you can read about it in next month's *RadCom*. Like many of the travellers he used 100 watts to wire antennas but from a specially selected site on the BVI. We know he enjoyed the trip and so we hope he will do it again.

You can read the other Travellers' comments on the website and especially read about Chris', VO2AC, trip to Labrador. Not everyone went to hot places! Chris said, "About an hour into the contest I managed to over rotate the antennas and ripped the coax apart on the both the TH7 and 2el 40m! (I'll blame it on lack of sleep and unfamiliarity with the station): I used the 80m dipole, through the external Dentron antenna tuner and turned off the amp until Nazaire (VO2NS) showed up about a 1.5 hours later to check on me. Nazaire and I then spent an hour at the top of the tower, in thick, heavy and wet snow, splicing the coax back together."

COMMONWEALTH MEDAL. The Commonwealth Medal is awarded to Dave Cree, J88DR (G3TBK) for all the bonuses he has given entrants over the years he has operated from J8 and for his enthusiasm and support to the Team Contest and the Rest of the Commonwealth team in particular.

COMMONWEALTH TEAM CONTEST. The results of this category can be seen in **Table 1**.

Yuri, 8P9AA (VE3DZ), (right) with Peter, 8P9NX (left) and the base of the antenna. But just look at that sea view!

CALL AREAS ACTIVE. There were 64 call areas active. These were 3B8, 3D2, 5B, 5H, 5N, 5X, 7P, 7Q, 8P, 9H, 9J, 9M2, 9M6, 9V, 9Y, C6, CY0, G etc, J3, J6, J8, P2, T30, TJ, V2, V5, V8, VE1, VE2, VE3, VE4, VE5, VE6, VE7, VE9, VO1, VO2, VP2E, VP2M, VP2V, VP5, VP8, VP9, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VU, VY2, Z2, ZB2, ZC4, ZF, ZL1, ZL2, ZL3, ZL4, ZS1, ZS2, ZS5 and ZS6.

SOAPBOX. On conditions... disappointing after a great week preceding (5X1NH), ... it was fun to enjoy BERU from the DX end. Sadly the disturbance made it a struggle (9M6/VO1AU), ... major solar storm spoiled conditions (C4Z), ... real hard work (G0KPW), ... a bit of a fizzler, (ZL2BR), ... a bit slow at times (8P6DR).

In general... amazing what you can work with an antenna at 15' (G0MTN), ... not many VKs and ZLs (G0HVQ), ... roll on 2012 (C4Z), ... I discovered that being a long way from the most active Commonwealth countries can make this a much more challenging event. (9M6/VO1AU), ... much improved score a result of a more serious effort and CW practice (G4KNO), ... heard 3D2A and P29CW but not mutual! (VE3CV), ... the strength of many G stations was unbelievable with dozens of S9 plus ones on 80 and 40 metres (VP2V/G3PHO).

On unwanted callers... they don't listen, they don't hear, they don't understand. They constantly send their calls, even in the middle of my QSO with someone else, making each contact a real torture to me (8P9AA).

ADJUDICATION. The poor and variable conditions led to a generally elevated error rate. A small number of entrants experienced problems uploading to the Robot and, on receiving warnings, contacted the adjudicator for assistance. Most of these difficulties were due to formatting errors caused by logging software that was not compatible with the contest and all were finally overcome. There was the usual small number of hand-written logs and one on a floppy disk. These continue to be welcome. Entrants are reminded to always check the published list or logs in checking to make sure their log is in the system.

The latest upgrades to the checking software enable the fabrication of a 'virtual' log for every callsign appearing in the entries. Automatic checking for near matches and flagging of uniques complete a trio of very useful tools for the adjudicator. This year, over 600 virtual logs were created. Of these, just over half were identified as genuine participants making multiple QSOs. Of the remainder, all but 61 contacts were eventually confirmed as 'busted calls'.

Another useful facility provided is the ability to generate a list of an entrant's contacts where the other station made an error. This provides a check against mis-logging of sent serial numbers and incorrect logging of band-changes. Quite a few entrants, initially assumed to have made receiving errors, had their points reinstated after detailed checking ... and, of course, the sending stations at fault picked up the penalties instead.

Comments and/or queries about the adjudication may be addressed to commonwealth.contest@rsgbcc.org or to secretary@rsgbcc.org.

75TH COMMONWEALTH CONTEST 2012. The 75th Commonwealth Contest will take place from 10 to 11 March 2012. As this will be the 75th contest there will special celebration prizes etc. More details later. Why not make plans for a DXpedition to celebrate?

Thanks to Steve, G3UFY for adjudication, Peter, G3LET for being Umpire for the Team Contest and to all entrants for their support. See you all next year.

WEBSEARCH

Commonwealth Contest site:
www.beru.org.uk and DXpeditions page – http://beru.org.uk/DXpeditions.html

RSGB Contest results
– www.rsgbcc.org/hf/results/2011/beru2011.shtml

VP2V/G3PHO
– www.flickr.com/photos/g3pho/page2/ and the next page.

VP2MXF – www.g3txf.com/dxtrip/VP2MXF/VP2M.html

Start Here

Renewing your Lifetime amateur radio licence

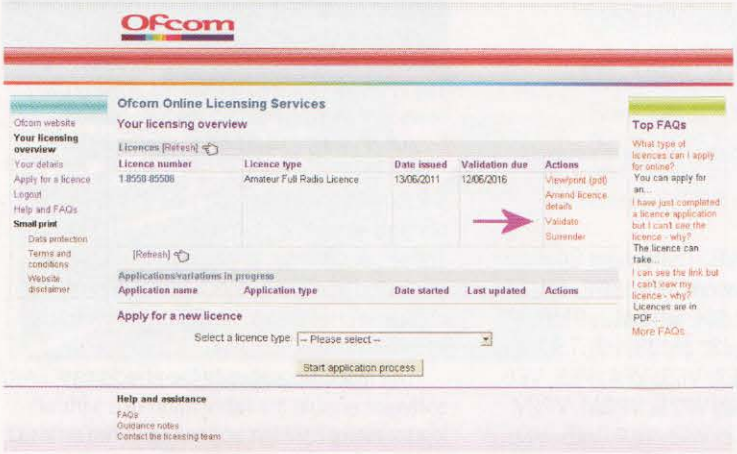


FIGURE 1: The main screen of the Ofcom licensing system, where you Validate your Lifetime Licence.

INTRODUCTION. In this month's Start Here, we help guide you through the process of renewing your licence (and also explain what clubs need to do). Although our amateur radio licences are for 'life', we're still required to make sure that our licence details are up to date and to renew it online at least once every five years. As the first Lifetime licences were issued in November 2006, some people will shortly be coming up to that milestone. (However, some the earliest licences have been granted an extension to 6 years – see later).

WHAT DO I NEED? In order to get started, you need a computer with access to the internet and the ability to view Adobe PDF files. This could be your home computer or even one at a local public library as the renewal process doesn't require you to install any software. You'll also need an e-mail account so that you can receive an e-mail from Ofcom with your username and password. For those of you who haven't got an e-mail account yet, a good option is a web based service such as Gmail (www.gmail.com) where you can create an account for free and get to it from any computer that has internet access. Finally you'll need your licence number – this is the one on your 'new licence for life'. This is not necessarily the licence number on the first document you got for your callsign, particularly for those of us who were licensed before 2006, as the licence numbers were updated when Ofcom moved to the current system.

WHERE DO I START? Armed with the above information, go to the website http://licensing.ofcom.org.uk. Under 'Radio Communications Licences' click on 'Amateur Radio'. Now click on 'Validate your existing Amateur Radio Licence online'. You should then be presented with a screen informing you about Ofcom's decision to extend by a year licenses issued between November 2006 and August 2007 because they expect to be very busy with Olympic licensing issues in 2012. Click on the 'Validate your Amateur Radio Licence online' link.

We're now asked to login in. For those of you who already have login details, you can proceed to login now. But if this is your first time to the Ofcom website you will probably need to create a new login.

- To create a new login, click Register as a new individual user. You will see a form asking for basic personal details and inviting you to choose a password and security question. Your password needs to be between 7 and 14 characters long and include upper and lower case letters plus at least one number. This places quite a burden on you to remember it, especially given the large number of usernames and passwords we have these days. Rather than using the same password for lots of applications, we suggest you choose a new suitable password and keep it in a safe place, not on your computer. This way if one of your interests was compromised, access isn't automatically given to all your interests!
- Once you've filled in these details, you can click continue where you'll be asked to enter your address (or, sometimes, select it from a list). Note that even if there is just one entry in the list, you still need to click on it to highlight it. After clicking continue, you're required to agree to Ofcom's data protection statement in order to continue. Now we're finally registered and we have to wait (a short while) for an e-mail from Ofcom with our username and password. The e-mail that contains your username and password together is in plain text, ie readable by anyone who has access to your e-mail account. So your licence details become only as secure as your e-mail access, despite being forced to choose such a secure password on their website. We suggest you delete this e-mail once you've memorised or safely stored the username and password details off of your computer.

LOGGING IN. Once you have your username and password, you can now log in. This brings you to an overview page of your licence(s), which shows a table all of your valid calls but not ones that you have surrendered (see **Figure 1**).

In the right most column you can then click on a link to take the appropriate actions, usually to first 'View/print' the licence so that you can check it. Once you're happy that it's what you expect, click on 'Validate' (arrowed in Figure 1). This brings you to a page where you're asked to confirm your licence details are correct or to amend your details.

If you need to amend your details, click 'I need to amend my licence details'. Some find the amendment process initially misleading, looking like you're requesting a new licence. However, follow through the process, giving the necessary details and, after accepting the licence declaration, it should tell you that your licence details have been successfully updated.

If your details are correct, click on the 'My licence details are correct' button. This renews your licence for another 5 years from the day that you click the button. You can then use the menu on the left side of the screen to return to the overview of your licenses. Once you've finished you can choose 'Logout' from the menu on the left to exit.

WHAT ABOUT CLUB CALLS? Club callsigns are relatively easy to renew/validate. Since each club callsign is issued to an individual licence holder, when the licence holder sets up a username and password to renew their personal callsign they'll see the club callsign in their licence overview and can renew it in the same manner as their personal licence. However, they are the only person to be able to do this so it may require some careful management to make sure it's renewed on time.

SUMMARY. Hopefully, this article has helped you to renew your licence(s) and in the process made you slightly more familiar with the Ofcom website.

In our next Start Here we will begin to demystify some of the jargon that we see in adverts for transceivers.

dependable power

wherever you need it...

£99.95

£599.00

ALINCO DM-330MW

Communications Grade Power Supply

- **Low noise**
- **Lightweight and portable**
- **Triple Protection circuit**
- **Low Ripple**

The Alinco DM330MW is an ideal travel companion for all your radio needs and Dxpedition adventures.

It's lightweight low noise design delivers up to 30 Amps with ease. With additional filtering, it is electrically quiet for communications use. Features include a large Illuminated Volt/Amp meter, rear panel Binding posts (32A), front panel cigar adaptor outlet (10A), two sets of snap-in terminals (5A) each, and a front panel customer-defined output "memory".

Specifications

- Input voltage 230VAC
- Output voltage (5 - 15) VDC variable
- Output voltage variation less than 2%
- Triple Protection:
  - Short-circuit,
  - Automatic current
  - Over-temperature
- Output current 30A(max), 25A (continuous)
- Ripple less than 15mVp-p at rated load
- Fuse: 4A
- Meter single Volt / current meter, back-light
- Size: 190(W) - 69(H) - 181(D)mm
- Weight: Approx 2.5kg with UK Mains cord

ALINCO DX-SR8

100 Watts HF Transceiver – with new 0.1-2W QRP Feature!

The DX-SR8 features Narrow filters, IF Shift, RF pre-amp, noise blanker and CW keyer with full break in, detachable front panel, front-facing speaker and logically laid out controls.

Specifications

- Transmit: 1.8 - 30MHz Amateur Bands (5MHz Band Transmit is optional with modification)
- TX: SSB, CW, AM, FM
- Power: up to 100 Watts SSB/CW/FM - 40 Watts AM
- QRP Mode: (0.1 to 2.0) Watt extra low power setting
- RX – 150-29.999Mhz (when optional 5MHz mod is enabled, RX extends to approx 35kHz-34.999MHz)
- Fight QRM with STANDARD features - IF shift, Narrow Filter, Noise Blanker
- Built in electronic keyer, QSK operation, CW Narrow Filter
- Dual VFO's - Split frequency operation
- 600 channel memories in 3 banks
- CTCSS enabled
- SWR Protection built in
- Size: 240 (W) x 94 (H) x 255 (D) mm
- Weight: 4.1 kg (approx)

Included accessories
- EMS-64 Dynamic microphone
- DC cable
- Microphone hanger EBC-7

Optional Accessories
- EDS-17 Front control remote kit (5m cable, front panel bracket, unit cover and hardware)

DX-R8
Desktop Communications HF Receiver with IQ output.....**£549**

DJ-G7E
Tri-Band 145/433/1296MHz (2m/70cms /23cms) Handheld Transceiver
£299

DJ-V17E
Water Resistant 145MHz (2m) 5 Watts Handheld
£149

DJ-175E
Tough, Rugged 145MHz (2m) 5 Watts Handheld
£79.95

DJ-C7E
Pocket sized Dual Band + extended RX range
£149

DR-635
Advanced Dual Band mobile tranceiver
£299

DR-135E MkIII
50 Watts 2m 145MHz FM Mobile Transceiver
£179

DR-435
70cm 35W FM Transceiver
£189.95

nevadaradio®
Unit 1 Fitzherbert Spur Farlington Portsmouth PO6 1TT

UK Importers & Distributors of Alinco
www.nevadaradio.co.uk
phone 023 9231 3090 email sales@nevada.co.uk fax 023 9231 3091

RAYNET

A new column for the radio amateur emergency communications service

The RAYNET team at Tattershal Lakes.

GET INVOLVED. This feature will depend on you. Send me news of call-outs, activities and other events and I will report them here – e-mail them straight to me, charlie@gi4fue.com. As I write, no doubt most groups are indulging in summer activities and exercises, so a brief paragraph or two will help to keep the column running. Groups of all affiliations are welcome to submit articles, info, in fact anything RAYNET related. I would particularly like to run some technical articles – how problems were overcome, articles on training and suchlike, so it's over to you...

To start off, here is an article written by Alan Clark, G8EVI, County Controller/RSGB Emcomms DRM, detailing the very successful participation in Operation Watermark and the lessons learnt from it. Operation Watermark was a National Exercise, simulating a major flooding situation. You can see from the report the value that RAYNET provided to the County Emergency Planning Officers.

OPERATION WATERMARK. The County groups were deployed for two of the days of this nationwide exercise on 9 and 10 March 2011.

On the first day, RAYNET Gold control was established in the RAYNET comms room in the former nuclear bunker at Lincolnshire Fire Brigade HQ, adjacent to the Emergency Planning Gold Control Room, BBC Radio Lincolnshire emergency studio and the emergency conference room with 60+ representatives of the blue light emergency services, utility companies, local government and the military. This RAYNET station was manned by Alan, G8EVI.

Silver control was situated in the Tedder Hall bunker in the East Lindsay District Council Offices at Manby, near Louth. This was operated by Gordon, G4WEC who was Net Control and who had done the lion's share of the planning for this exercise, and is highly commended.

The neighbouring gymnasium hall, situated within the same ex-military complex, had been nominated as registration hub for evacuees from the flooding at Sutton on Sea. These evacuees were then transferred by coach to Louth Town Hall, where they were accommodated and fed by the WRVS and Red Cross, with Malcolm, G3ZUI as RAYNET op.

There were two evacuation points identified at Sutton on Sea operated by Charles, G0CBM and Cyril, M6CRE. Terry, G0SWS was stationed at Sutton Primary School, which was to be evacuated, then tasked to accompany the coach to the evacuation hub, providing progress reports. Barry Middleton acted as Roving Mobile and John Gregory as Video Mobile, providing video footage of the event. Pete, G0CEG and Alan, G6RFR were nominated as fixed relay stations, should the need arise.

Frequencies used were 144.650MHz, with 144.675MHz as backup.

The RF path had been tested prior to the exercise and provided weak – but readable – signals on 2m. Conditions on the day were poorer and the relay stations, who were both close to Gold but having much better elevations, were able to radiate over the local cliffs and so were implemented. Links to the relays were established on 2m, 70cm and 6m.

As Lincolnshire is a very large county, with limited radio amateur – and hence RAYNET – membership, our policy has always been to employ other volunteer groups' comms systems, when available, by employing their control stations as one of our hubs where required. In line with this strategy, Gordon had refurbished hi-band VHF PMR sets donated to our group by East Lindsay District Council and placed these at the disposal of our local 4x4 rescue organisation.

It was noticed however by Malcolm, G3ZUI, that many organisations were placing a heavy reliance upon cellphones, which would probably be rendered ineffective in a real emergency situation. He also commented on the advisability of additional operators to ensure continuity.

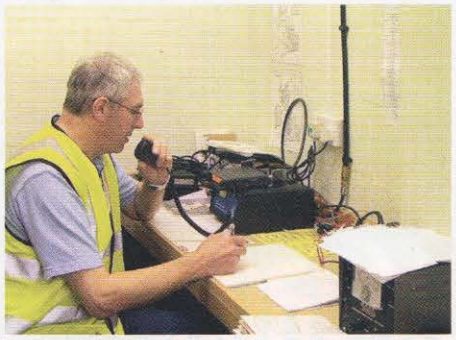
The brief for Thursday's events was to provide comms within the environs of the Tattershall Lakes complex.

The RNLI and RAF SAR organisations were to conduct rescues of volunteer casualties from the lake using inflatable vessels and helicopters. Gordon, G4WEC operated the Control station situated in a transportable 'pod' unit. Jim, MOMHW and Billy, 2E1AXL were deployed as hand portable and Barry, G4DBS as roving mobile. Again, relay stations were used with Pete, G3CEG passing comms traffic back to G8EVI at FBHQ.

OBSERVATIONS. The Wednesday proceedings went well with good comms links provided by the relay stations, although it would be far preferable to have direct communications under all atmospheric conditions. This is difficult on 2m; the antenna location at FBHQ is as good as practicable, on the main radio tower, but the station is shielded too much to the North and East by the cliffs between Lincoln and Waddington. At Manby, the antennas are mounted on a secondary, lower tower in an internal courtyard. Net discipline and operating procedures were very good.

Both operators at Silver and Gold experienced difficulties in getting messages to and from the directing staff, having no runners/loggers and no specified contact person.

We demonstrated the organisation's versatility as the emergency services placed an inject into the scenario that the landline telephone system had failed. They requested that two 999 emergency mobile reporting positions be established within the village at Emergency User stipulated NGRs. G4DBS was despatched to conduct comms tests from the specified locations. Comms links were established and the Lincolnshire Police



Gordon, G4WEC at the Manby control room.

Tattershall Lakes car rescue.

RNLI using jet craft.

representatives in Gold control then enquired whether a mobile station could be deployed to County Police HQ at Nettleham.

Barry, G4DBS was then tasked to investigate this RF path on his return. This link was proven to be viable and the police representatives were impressed with the adaptability of RAYNET.

The Thursday comms links again were easily established using GOCEG as relay, but unfortunately there was very little radio traffic. Largely, the operators themselves generated what there was.

At the Silver location, the pod unit mysteriously remained on its trailer and did not come with telescopic mast as promised. There were no useable operating positions inside.

RECOMMENDATIONS.

- All control stations should have an additional operator to act as logger/relief/runner.
- A directing staff member or user service member should be designated as RAYNET contact.
- Fixed station operators should have a land line/intercom/field telephone/PMR link with directing staff.
- User services should be briefed to channel all traffic via the RAYNET operators, unless they have their own dedicated comms systems (not cellphone) with a control point acting as a RAYNET HUB.
- 80, 40 and 6m links should be established and tested between Manby and Lincoln.
- It should be borne in mind that, whilst multi agency exercises are very useful in order to appreciate a real time scenario, they do not provide a great deal of communications traffic. From this point of view, smaller exercises involving only two or three volunteer groups allow much more intensive training.
- With the above in mind, it might be feasible to break down a large exercise into a table top exercise, followed by one or more small physical exercises. This would allow more focussed injects by user services, as RAYNET are tasked only with handling third party generated traffic, and not introducing their own input.

Homebrew

A DDS VFO for the HF transceiver

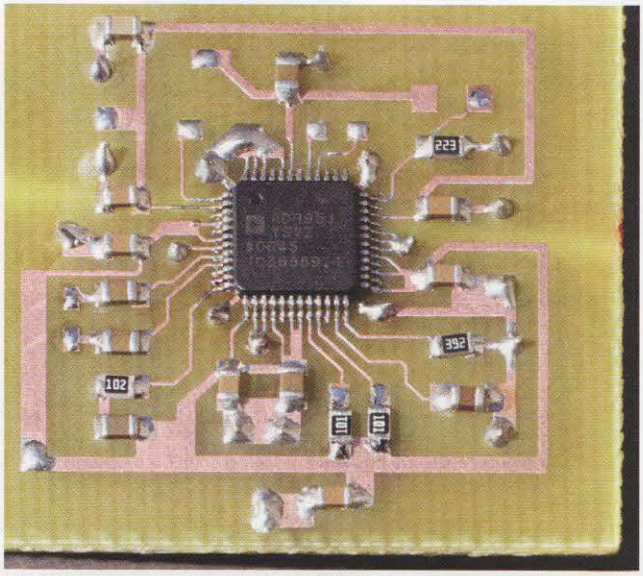


PHOTO 1: The completed AD9951 DDS board.

A BETTER OSCILLATOR. So far, I have been using the AD9851 direct digital synthesis (DDS) VFO [1] as the local oscillator for the HF transceiver project. This has performed reasonably well, but there is definitely room for improvement.

The newer generation of DDS devices offer significantly improved performance when compared to older devices like the AD9835, AD9850 and AD9851. The AD9951 and AD9912 are widely used by builders of high performance radio equipment. These devices have a specified maximum clock speed of 400MHz and 1GHz respectively. A high clock rate allows a high maximum output frequency and reduced spurs at lower output frequencies. The newer devices have a 14 bit digital to analogue converter (DAC) instead of the 10 or 12 bit DAC used in older DDS chips. Each additional DAC bit adds 6dB to the DAC output range. The newer chips also use a much lower supply voltage. The DDS core of the AD9951 runs at 1.8V. The parts of the chip associated with digital input/output (I/O cells) can be run at a higher supply voltage of 3.3V. This allows for direct interfacing with 3.3V logic. Some of the AD9951 digital input pins are 5V tolerant. This is very convenient when the DDS is controlled by a 5V microcontroller like the Pinguino PIC board [2]. Power consumption in CMOS circuits is proportional to clock frequency. Using a low supply voltage allows for very high clock frequencies while keeping power consumption within acceptable limits. Advanced DDS devices have much in common with computer CPUs. The CPU in my desktop PC has a core supply voltage of 1.4V and a maximum clock frequency of 3.2GHz. This is dynamically reduced to 1.1V and 1GHz when energy saving mode is active. The latest CPUs run at even lower voltages and higher clock speeds. Hopefully, this state-of-the-art technology will make its way into the next generation of DDS ICs. I hope they come in a homebrew-friendly package...

I have chosen the AD9951 for the new DDS project. With a clock frequency in the 300-400MHz range, this chip should be capable of providing a clean local oscillator signal for all of the HF bands and the two lowest VHF bands. As I intend to use a high quality 100MHz OCXO (Homebrew, August 2011) for the refclock, I have four options for refclock: 100MHz direct from the OCXO, 200MHz using a frequency doubler, 300MHz using a frequency tripler and 400MHz using the 100MHz OCXO with the DDS internal refclock multiplier set for 4x. As the first two options result in a refclock frequency that is too low for my application, 300MHz (tripler) and 400MHz (refclock multiplier) are the only viable options. The AD9951 also has a built-in crystal oscillator that can be used with the internal refclock multiplier. My PCB layout does not support this option.

The physical layout of the DDS is quite similar to the previous DDS project (March 2010). The DDS IC and a few critical components are mounted on a small PCB (Photo 1), while the power supply voltage regulators are mounted on a separate board. Other peripheral circuits like the output filter are not included on the DDS carrier PCB. This modular approach might seem untidy compared to a single PCB solution, however it does offer some advantages. Keeping the DDS separate from electrically noisy circuits like the PIC micro can help to reduce unwanted noise in the DAC output. The modular DDS also tends to be more flexible. The previous AD9851 project was used as a local oscillator in the LF/MF receiver project, as a bench signal generator and as part of a more complex DDS/PLL hybrid in a VHF synthesiser (June/July 2010). Keeping the DDS PCB small and relatively simple makes it easier to build – and reduces the amount of rework required if things go horribly wrong. There is always a good chance that the first version of a PCB will end up in the bin.

Figure 1 shows the AD9951 pinout. In common with other DDS devices made by Analog Devices, separate power pins are used for the digital and analogue parts of the circuit. Most constructors will be quite familiar with the idea of using separate power supplies for different parts of a circuit. It is quite usual for two separate circuit blocks to have separate power supplies (or well decoupled supplies from the same source) for the positive supply only. In most cases, the negative supply is via a negative supply rail or a ground plane that is common to both circuits. The AD9951 is designed to use separate power supplies for both the positive and negative supply pins. This means that even in the usual negative-ground configuration, separate ground planes are used for digital (DGND) and analogue (AGND) ground. In practice, this means that there is no direct connection between the DGND and AGND planes of the PCB. However, the two grounds

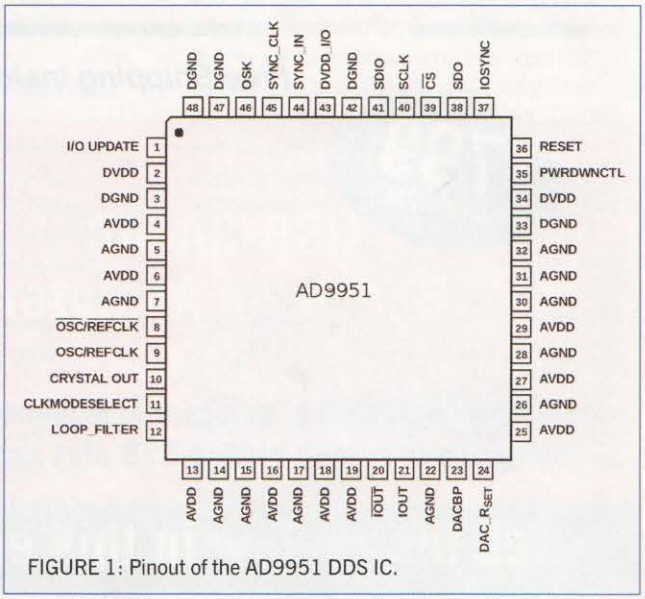


FIGURE 1: Pinout of the AD9951 DDS IC.

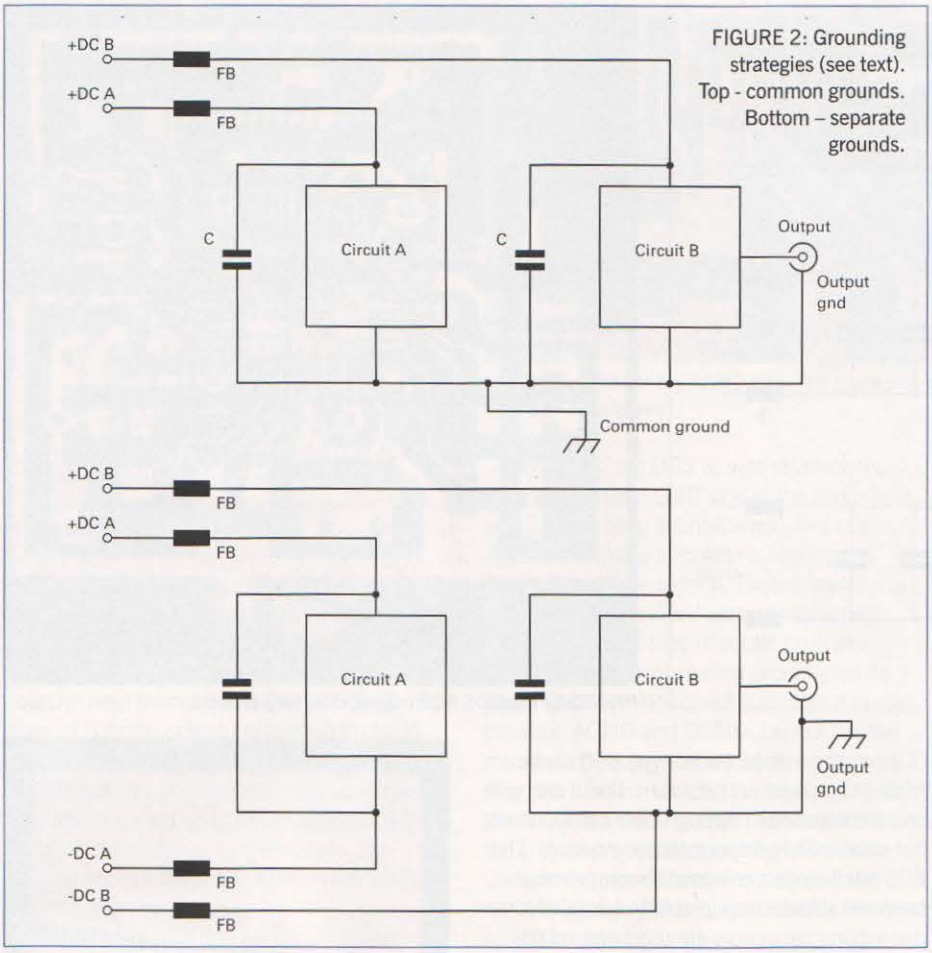


FIGURE 2: Grounding strategies (see text). Top - common grounds. Bottom – separate grounds.

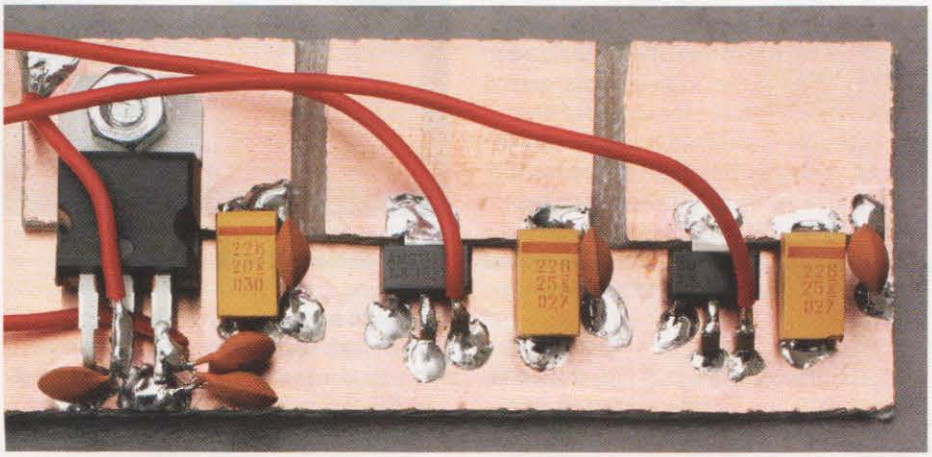


PHOTO 2: Completed voltage regulator board.

may well be connected at some remote point such as the equipment chassis or the negative terminal of a battery.

The simple schematic at the top of **Figure 2** shows a typical negative-ground configuration for a pair of circuit blocks. The ground/chassis/negative connection is common to both circuits. This arrangement works perfectly if the complex impedance of the ground plane is zero. At high frequencies, the resistance (and particularly the inductance) of the earth plane may be significantly greater than zero. In this case, noise current in one circuit will produce noise voltage across the common earth path. This is particularly troublesome in the case of a DDS, which has very high speed digital circuits and very low noise analogue circuits in the same package. The lower schematic in Figure 2 shows the same two circuit blocks with separate power supplies for both positive and negative power rails. Note that the circuit B ground is now effectively isolated from circuit A.

POWER SUPPLY. There are several possible configurations for the power supply. The simplest would use a single 1.8V regulator to provide both digital and analogue supplies. To maintain good isolation between digital and analogue supplies, it is preferable to use two separate 1.8V regulators. Surface mount 1.8V regulators are small and quite cheap. The AD9951 will run quite happily with just 1.8V on all supply pins. Unfortunately, the digital input pins are not 5V tolerant unless the DVDD_I/O pin is fed from a 3.3V supply. This means that an ideal power supply configuration will need at least three separate supplies, each with its own voltage regulator IC.

The resulting power supply circuit is shown in **Figure 3**. I used a pair of surface mount AMS1117 1.8V regulators, one for AVDD and one for DVDD. As I didn't have a surface mount 3.3V regulator, I used a larger TO-220 size regulator instead. The 3.3V DVDD_I/O regulator is an LD33CV. All three regulators use the same pin configuration as the LM1117: pin 1 = gnd, pin 2 = output, pin 3 = input. Note that the heatsink tab is internally connected to pin 2 (output). This means that the heatsink tab must not be connected to chassis/ground. This pin configuration is not universal; if you use a different regulator, check the data sheet for pinout details. You should also measure the three output voltages carefully before you connect the supply lines to the DDS board. 5V or even 3.3V on a 1.8V supply pin would probably have fatal consequences for the DDS IC.

The regulator unit is made from two strips of single sided PCB. The narrower top strip is superglued to the bottom strip. The assembled unit is shown in **Photo 2**. The copper foil of the top strip is cut into three sections for the three supplies. From left to right they are 3.3V DVDD (for I/O), 1.8V DVDD, 1.8V AVDD. You may just be able to see the surface mount 0.1μF capacitors to ground from pins 2 and 3 of the 1.8V regulators. A ferrite bead is placed on all six wires to the DDS board. The negative lines for both digital supplies are connected directly to the DGND plane on the back of the DDS board. The negative wire from the 1.8V analogue supply is connected to the AGND plane on the back of the DDS board. The positive DVDD, DVDD_I/O and AVDD are connected to their respective connection points on the DDS board. Take great care to ensure you don't connect the 3.3V supply to the wrong place. The output voltages are taken from the three rectangular tabs on the top strip of the PCB. Note that my unit has a potential hazard because I used a 3mm metal screw and nut to secure the regulator to the PCB foil. The other side of this screw should be isolated from ground. This issue won't arise if you use three surface mount regulators or if you use a 3mm nylon screw instead.

THE AD9951 DDS. The AD9951 data sheet **[3]** contains a lot of useful information. It is a fairly complicated device and some of the information is a bit terse; I found it difficult to follow. The excellent DDS projects by G3XJP **[4]** and G6ALU **[5]** provided a lot of help and inspiration. While I was working on the PCB layout, there were several occasions when I was unsure of what I should do with an unused pin. Tie it high, tie it low or leave it unconnected? Referencing these known good projects provided a quick and easy answer. For example: the PWRDWNCTL pin. Both of the above projects

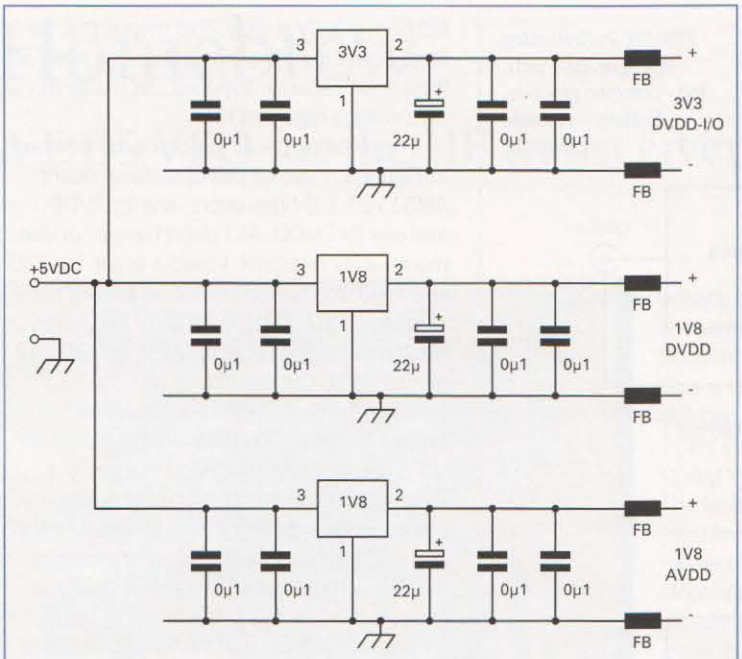


FIGURE 3: Voltage regulator circuit.

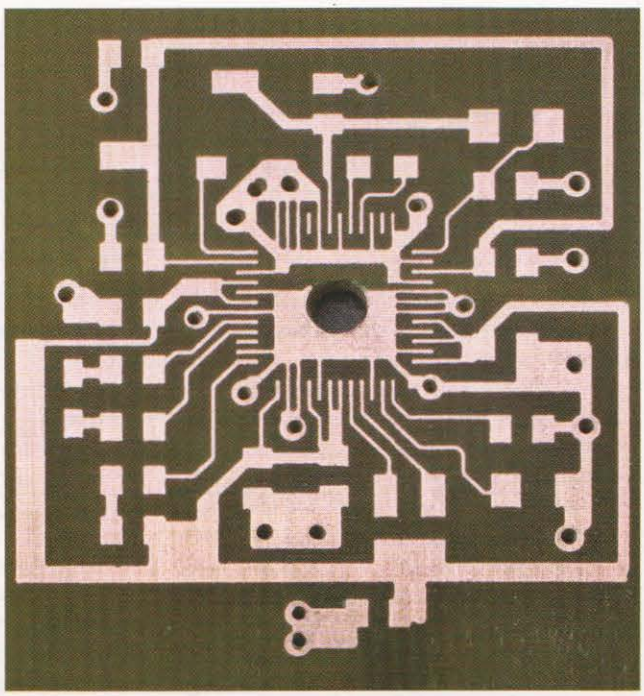


PHOTO 3: The DDS PCB copper side, fully drilled.

have it tied to DGND. I would probably have figured this out for myself eventually, but it was nice to have a proven reference. Many thanks to both authors.

Good grounding and power supply decoupling is essential in a DDS. The manufacturer's evaluation and development boards are usually multi-layer boards with plated through vias (inter-layer connections). Kitchen table boards are generally limited to two layers and hand soldered wire vias. This limits the number of vias because hand soldered ones are big and ugly. It also means that vias cannot be placed under ICs. This hasn't been a big limitation in the past, but this is changing now that BGA (ball grid array) and similar packages are becoming more common. This type of chip has all connections under the IC.

The analogue ground is a particularly important part of the DDS circuit. This is the ground plane for the DAC and other sensitive analogue circuits. As we are concerned with suppressing *all* noise and spurious signals, even at levels of 80-100dB below the wanted output, we must take great care to keep noise out of the AGND and AVDD circuits. In addition to the AGND pins listed in Figure 1, the conductive pad on the bottom of the chip must be connected directly to AGND. The only practical way of doing this on a home-made PCB is to drill a 3mm hole through the PCB at the exact centre of the IC pads. A short length of copper braid can be used to make a very short and direct connection between the top and bottom AGND copper foil and the IC pad. The G3XJP DDS article [4] gives a very clear and detailed description of this process.

Ideally, every ground pin would have a direct connection to the ground foil on both sides of the board and every power supply pin would have several decoupling capacitors. This is not quite possible because of the size of the components. I used type 805 surface mount capacitors and resistors. These are quite small compared to through-hole components, but smaller SM components are available. The 805 package is a reasonable compromise between size and solderability. A total of nine decoupling capacitors are used around the DDS IC, four on the digital side and five for AVDD. **Figure 4** shows the PCB layout in the immediate vicinity of the DDS IC. Analogue ground vias are shown in green digital ground vias are shown in blue. The outline of the conductive pad is shown in yellow. The AGND pins are connected directly to the top AGND plane and to the main AGND plane on the bottom of the PCB using the conductive pad and five additional wire vias. The digital ground is similarly connected top and bottom using four vias.

PCB. The artwork for the DDS PCB is available in native *PCB* and in Postscript format. The current version is at http://homepage.eircom.net/~ei9gq/art.html.

Note that the track pattern is reversed so that the toner will be on the PCB side of the film. Check this carefully before exposing the PCB. You don't want to make a nice PCB that is a perfect mirror image of mine! I used my old HP laser printer to print the track pattern on Staedtler OHP film. This printer has seen better days and I suspect it is overdue for a new toner cartridge. I find I can only get sufficient contrast (opacity of the track pattern) if I use two stacked sheets of film. To save OHP film, my artwork has two copies of the track pattern. Simply cut the OHP film in two and you have two copies of the artwork.

Because of the very small size of the IC pads, accurate alignment of the stacked sheets is quite difficult. I used a strip of masking tape to fix the first sheet of film to the glass exposure frame and a second strip to hold the second film in alignment. I spent about ten minutes with a good magnifying glass before I was happy with the alignment. The PCB is double-sided photo sensitive fibreglass board (Maplin FA61 or similar). I used a 500W halogen lamp to expose the board. The process is described in detail in Homebrew for July/August 2006, the *Homebrew Cookbook* and recent editions of the *Radio Communications Handbook*. After exposure, the board was developed using a sodium metasilicate solution (Maplin AP01B), rinsed and then etched in a ferric chloride bath. After a final rinse, the etch resist was removed using fine steel wool. The bottom of the board is not etched.

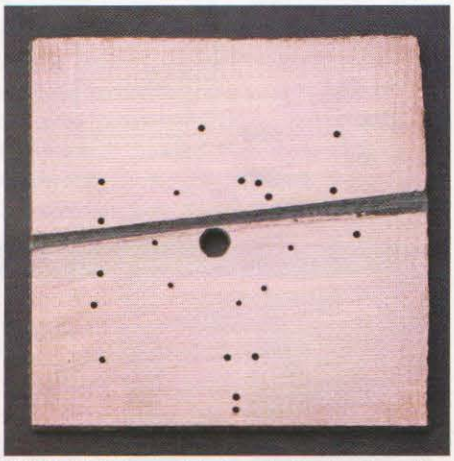


PHOTO 4: Bottom of the board, showing the wide cut that separates AGND & DGND.

The gap in the pads at each corner of the 48 pin IC provides space for a reasonably wide PCB track. This space was exploited at all four corners to make connections between the top and bottom ground foils. For my first attempt, I used the standard 'signal' via size in *PCB* [6] for most of the vias. This turned out to be a rather unfortunate mistake. After the

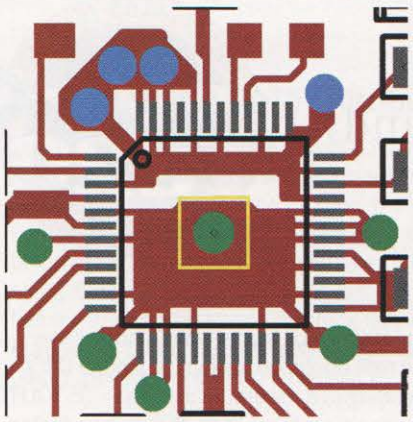


FIGURE 4: PCB layout around the DDS IC. Analogue ground vias are green; digital, blue. The conductive pad outline is yellow.

first batch of two boards were etched and cleaned, I discovered that this via size is effectively undrillable. Any drill larger than 0.6mm would completely strip the annulus (copper ring) from around the via hole. Drill sizes of 0.5mm or less are hard to find and extremely easy to break. The revised layout uses larger vias, not the next size up 'power' via, which is too big, but the signal via with the size incremented by three steps. For *PCB* users, tap the 's' key three times while the cursor is over the via.

I used a 0.6mm drill for the via holes. I managed to drill them all without breaking a drill. A 3mm hole was drilled through the via marker in the centre of the IC pads (see later). **Photo 3** shows the topside of the board after drilling.

To separate the AGND and DGND on the bottom of the board, the foil is simply cut in two using a hacksaw at a strategic point under the DDS IC. Spend some time identifying the AGND and DGND via holes. You don't want to cut in the wrong place. The rough edges of the cut were removed using a carpet knife and the gap was deliberately widened to reduce capacitive coupling between AGND and DGND. **Photo 4** shows the bottom of the board. Use the photograph and the via holes as a guide.

The wire vias are bare 0.4mm copper. This was stripped from standard 4 core telephone cable. The wire is threaded through the via holes from the bottom side, bent through 90 degrees and then soldered to the bottom foil. Use as much solder and heat as you like. You should be more careful with the top side. Snip the wire at about 1mm above the board and solder the via using a small pointed tip and very fine solder. **Photo 5** shows some of my AGND vias. The outer two are good. The middle one was a bit grotty, so it was resoldered after the photo was taken.

The capacitors and resistors were hand soldered using a small pointed tip and very fine solder. The components were held in place using a wooden cocktail stick while the first joint was made.

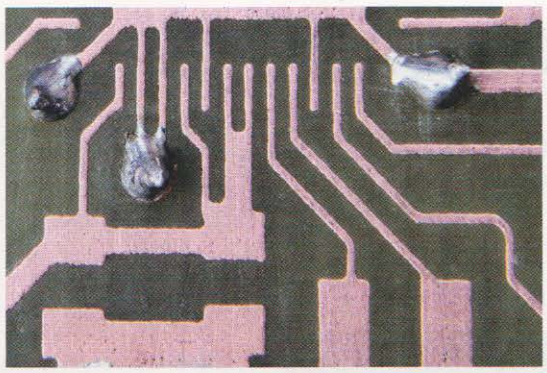


PHOTO 4: Some of my AGND vias. The lower one is poor and was later re-soldered.

Mounting the DDS IC was relatively easy. The edge of the AGND side of the 3mm hole was tinned using a small amount of solder. This will help the IC pad to make a good connection to the top foil. Excess solder was carefully removed using desoldering braid. Any small blob of solder here will prevent the IC from seating properly on its pads. Excess solder could also form a bridge between AGND and DGND. I spent several minutes checking and re-checking the pad alignment before tacking the corner pins in place using a small pointed tip. Soldering the chip in place took just a few seconds, using the drag soldering technique. Each row of pins was liberally coated with flux from a CW flux pen. The pins were soldered by dragging the tinned iron along the top of the pins. Two unwanted solder bridges were removed using desoldering braid dipped in flux. I couldn't find any other solder blobs or bridges between the pins. I used a digital camera with a macro lens for a final check. I find it can see better than I can, even when I use a magnifying glass and a bright light. A short length of copper braid (audio cable screen) was soldered to the IC pad. The joint was made using just enough solder and heat to make a connection to the top AGND foil and the IC pad. The braid was then soldered to the bottom AGND foil.

The finished board is shown in Photo 1. After construction and carefully checking the DDS board and the regulator unit, the DDS board was wired into my DDS test rig. The serial clock, data and update lines were tied to DGND through 22k resistors, a 100MHz clock was connected to the refclock input and the unit was cautiously powered up by connecting a 5VDC supply to the input of the regulator unit. The chip ran lukewarm, but not hot, and all three regulators ran cool.

ERRATA. In last month's Homebrew there is an error in Figure 2. The negative side of the supply should not be grounded.

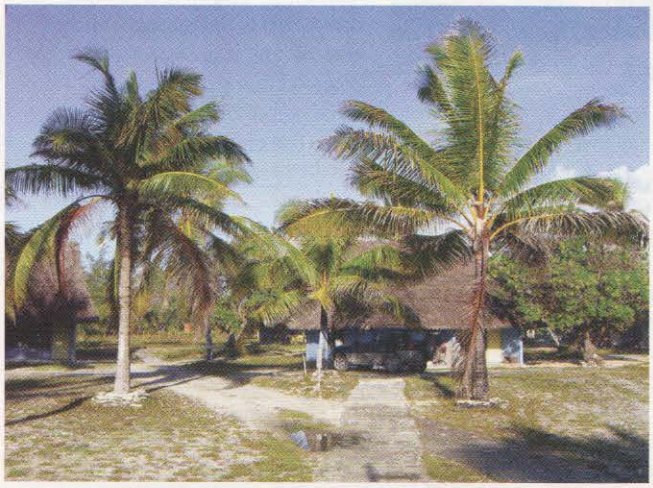
Next month: Driving the AD9951 DDS using the Pinguino PIC board.

WEBSEARCH

[1] Homebrew, March 2010 and November 2009
[2] see [1] and http://homepage.eircom.net/~ei9gq/picboard.html
[3] AD9951 data sheet: see www.analog.com
[4] Google "DDS-AD9951 for STAR"
[5] AD9951 DDS board: G6ALU – http://tinyurl.com/5todx3u
[6] http://pcb.gpleda.org

Propagation to T32C

The DXpedition to Kiritimati (Christmas Island) in the Northern Line Islands



Kiritimati is a Pacific Ocean atoll in the northern Line Islands.

CHRISTMAS ISLAND DXPEDITION. If you want to work T32C later this month it will pay to do a little bit of planning. In terms of the propagation to that part of the world there are a few factors we need to take into account.

The first question is, "where is it?" Kiritimati, or Christmas Island, is a Pacific Ocean atoll in the northern Line Islands – it should not be confused with the island of the same name in the Indian Ocean (VK9/X)! The island lies 144 miles north of the equator and 8,400 miles from the UK.

This highlights the first propagation problem – Kiritimati lies on a beam heading of about 335° from the UK, which puts our signals slap bang through the auroral oval around the north pole. Conversely, the long path heading of 156° (and 16,400 miles) goes through the south auroral oval. So, we need to keep a close eye on the A and K indices during the DXpedition. An unsettled geomagnetic field is a sign that solar ions are being funnelled in to the poles. While the resultant aurora can be very pretty it won't do much for ionospheric propagation over the poles so we really want to see very low A and K indices.

The K index is updated every three hours whereas the A index is an average of the previous 24 hours. So look for a K index of 1 or so for the best results or an A index less than 10 – see www.solarham.com. Another indicator is the solar wind indicator. This shows the current state of the interplanetary magnetic field (IMF). We really want to see a low solar wind speed (below 400km/s) and a Bz (magnetic field direction) pointing north or at least neutral and not south. A southerly Bz will result in ions being coupled into the Earth's magnetic field more readily, which we don't want.

In any event, don't be surprised if the signals from T32C sound a little fluttery – this is quite common for signals coming over the poles.

WHAT TO EXPECT. So, what can we expect in terms of propagation on each band? Starting with the low bands first:

160m (1.8MHz). If you are to work T32C you are going to need a decent Top Band antenna and an electrically quiet location. You also need a dark path between you and T32C, which limits your operating time dramatically.

At the beginning of the DXpedition the sun sets at T32C at 0422UTC. The sun rises in the UK at about 0556UTC, so you have a small window of opportunity between those times. At the end of the DXpedition this windows moves to 0415 – 0645UTC. These are for the short path. There are possible greyline opportunities, possibly around the sunset/sunrise, but they are hard to predict.

If you want to work them on Top Band you are going to have to get up early – and signals are likely to be very weak!

80m (3.5MHz). It is a similar story for 80m. While you don't necessarily need to have a completely dark path between you and T32C, the times will be similar to Top Band: in the 0430 – 0630UTC timescale at the beginning of the DXpedition, moving out to 0400 – 0900UTC towards the end.

Prediction software suggests that best times will be the middle of this period (around 0530 – 0630UTC) but there might be sunrise/sunset enhancements. Again, this is not going to be easy and weak signals are likely to be the order of the day.

40m (7MHz). Forty metres is a little more forgiving in terms of a dark path, which means we have a slightly longer sweet spot. Nevertheless, you need to be on the band early in the morning. At the beginning of the DXpedition signals may start to show for well-equipped stations at around 0400, building to a maximum at 0500 – 0530UTC. If signals are there at all, they will be fading out around 0830UTC.

SOLAR ACTIVITY. You will notice that I haven't said anything about the solar flux index or sunspot number yet. This is because the lower bands are less dependent on sunspot numbers – we tend to look for quieter geomagnetic conditions instead. But as we head up the spectrum, more sunspots would be better for us.

While it is impossible to predict with any accuracy what the solar flux will be (I'm writing this in July) we can make an assumption. First off, the VOACAP-based propagation prediction programs work best with a smoothed (or averaged) sunspot number. The smoothed sunspot figures at the National Geophysical Data Center for September/October are 47.2 – 49.9. These equate to a solar flux index of about 100-102. This is at least a starting point that we can move on from.

30m (10MHz). I have a good feeling about being able to work T32C on 30m. It is a data/CW-only band, so we don't have to fight it out with SSB users. Also, the band is slightly less popular than, say, 20m and many people do not have high-gain beams. Having said that, usable signals will probably not appear on the band until 0400 and will peak at about 0700-1000, fading out shortly after. There is a slim chance that signals will remain throughout the day, as 10MHz is likely be above the lowest usable frequency (LUF) up to mid afternoon.

20m (14MHz). This band will be choc full of stations trying to work T32C and, perversely, may prove to be one of the hardest bands on which to work them. The band will be open for a longer period than the lower bands, but will peak at around 0730-1200UTC. Signals (if there at all) will then take a bit of a dive before the possibility of another short opening around 1600-1700UTC. Weak long-path signals are also a possibility on 20m, both between about 0600-1100UTC and 1600-1800UTC.

17m (18MHz). As we head up in frequency the band opportunities get shorter again, but

T32C

27 September to 25 October 2011

The T32C DXpedition is the fifth major DXpedition organised by the Five Star DXers Association (FSDXA). This will be a major effort, with a target of more than 150,000 QSOs. Given the remoteness of the location and uncertainty about propagation during this new sunspot cycle, 3½ weeks of operation is planned, including 4 full weekends. There will be up to 15 stations active around the clock. They will attempt to contact between 1,000 and 2,000 unique stations in the UK, a major challenge from the Pacific, particularly bearing in mind the severe planning restrictions on antennas in the UK. Openings to Europe will be short, so the team will be very disciplined in exploiting these openings (short path and long path) whenever they can.

that doesn't mean it isn't worth taking a look. Ionospheric D layer absorption gets less the higher we go and the bands become less noisy too. So don't dismiss 17m and up. Look for short path openings between 0900-1200UTC and again from 1700-1900UTC. We are often on the edge of the maximum usable frequency at the beginning and end of the slots so the signal could just appear out of the noise.

Long path also throws up some opportunities – around 0500-0630UTC for well-equipped stations and again at 1600-2000UTC.

21m (15MHz). The problem with the higher bands is that the solar cycle has not really been playing ball – the solar flux has not really been high enough very often to provide good, reliable DX openings. It may therefore be a bit of a lottery. Having said that we can narrow down any possible openings quite tightly.

0930-1200UTC may give you the best shot on short path, with 1600-1800UTC being the next best slot. Note the lull in the afternoon. Long path possibilities are from 0600 through to 0800UTC for well-equipped stations, with a further possible peak in the late afternoon/early evening.

12m (24MHz). Twelve metres follows a similar pattern, but the possibility of an opening is even less likely. Look between 0930-1130UTC and again 1630-1830UTC. Long path openings are again a possibility for well-equipped stations, peaking at 0800UTC and 1800UTC.

10m (28MHz). With a predicted solar flux of about 110, this is going to be a tough path. I have no doubt that a few top DXers in the UK will work T32C on 10m, but I don't think it will be an everyday occurrence – but feel free to prove me wrong! Peak times for short path contacts are quite easy to predict – about 0930-1130UTC, peaking at 1030UTC and a lesser peak at 1700UTC. Long path peaks at 0900UTC and 1800UTC. It looks like the long path may provide the best signals.

OVERALL. Working T32C is not going to be like working Italy. Well-equipped DXers with high Yagis and linears will no doubt do quite well. The 'little pistols' with 100W and wires will need a good dose of luck, skill and extended operating time. If you are running a compromise antenna, now is the time to think about improving it. Even a near-vertical monoband half wave dipole sloping in a northerly direction may help. Just start praying to the propagation gods for settled propagation conditions and a high solar flux – and don't forget to check the long path.

WEBSEARCH
www.t32c.com

National Hamfest

Notts & Newark Showground, 30 September & 1 October

The mobile flea market at the National Hamfest.

Traders booked as of 15 August

AM Tools
bhi
Birkitt
Bonito
Bowood Electronics
By Vac
Chase Electronics
Cross Country Wireless
Czech Morse Keys
HARP Keith Roden
HiFi SSB
Icom
Kanga Products
Kenwood
KMK UK Ltd
LAM Communications
Linear Amp
MOCVO Antennas
Martin Lynch & Sons
Mastrant
Mikey Electronics
Moonraker
Peak Electronic Design
Phil Williams
Poole Logic
Powertech Computers
PW Publishing
Radioworld
Radio Kits
Radixon
Sandpiper
Snowdonia Radio Company
Spiderbeam
Tecadi
Waters & Stanton
Westlake
Yaesu

ONE MONTH TO GO. There is just a month to go before the 2011 National Hamfest organised by the RSGB in conjunction with Lincoln Short Wave Club. There will be lots for visitors to see over the two days with the main hall full of all the main traders in the UK as well as several for overseas. There will be plenty of special interest groups and local organisations as well as a large Bring & Buy. This year, the Bring and Buy will be even bigger and, to give the stall more space, it has been moved to the Information Marquee and will be opened earlier.

Entry tickets are on sale now and, if purchased in advance, there are several discount options available. For those thinking of filling a car or, better still, a coach, then multiple ticket discounts could make that club trip well worth while.

You can get a Morse test 'on demand' at various speeds. Contact the Information Centre when you arrive at the show and a test will be organised for you. Lincoln Short Wave Club will be operating GB11NH on a variety of HF and VHF bands. There will be a 70cm station on the GB3LS repeater to make use of the IRLP link available on the repeater. Both stations will be located in the Information Centre.

SHOW STOPPERS. Several traders at the National Hamfest will be launching new products or showing products that have recently arrived in the UK.

Cross Country Wireless will be launching the SDR-4 receiver, a general coverage receiver tuning from 0.85 to 30MHz with relay switched band pass filtering and additional high pass and low pass filtering to allow it to be used close to high power VHF/UHF and LF stations. It has a built in USB sound card and Si570 local oscillator with two separate USB connections to the users PC. The receiver is powered directly from the PC USB sockets.

The antenna inputs are transformer coupled to provide good isolation between the antenna system and the PC. There is a 50Ω input on a BNC connector and a 450Ω input on 4mm sockets for a better match with random length wire antennas or balanced line feeder. There are two push switches, one for a 20dB attenuator and the other for a 10MHz calibration signal to allow easy setting of the receiver I/Q balance and S-meter calibration.

The SDR-4 PCB design is based on a Eurocard size PCB of 160 x 100mm and it is mounted in an Evatron extruded aluminium enclosure with overall dimensions of 175 x 106 x 30mm. The price will be competitive at £149.95.

Mastrant are bringing two new diameter rope products Mastrant-P 5mm (strength 500 daN kg) and Mastrant-D 5mm (strength 1200 daN kg). Mastrant-P 5mm is made from polyester with, the manufacturers feel, a great performance/price rate. Mastrant-D 5mm is made from Dyneema (high tenacity polyethylene) and covered by polyester. Prices are expected to be £38 for P5mm and £139 for D5mm.

bhi will be launching a new product, the bhi Mini Switcher. It is a compact 2 way switch box that can be used with all bhi main DSP noise cancelling speakers and in-line units. It allows the user to connect two radios to their bhi noise cancelling product. The price will be around £17 including VAT.

Waters & Stanton will be joined by Bob & Sarah Heil from Heil Sound USA. Bob will be demonstrating his new Genesis (budget) and Elite (top end) ranges of microphones and accessories. He will lecturing both days in the area behind the W&S booth. They will also be joined by Klaus Lohmann of Flex-Radio USA, who will demonstrate the latest range of SDR equipment. From MFJ, W&S will have the new MFJ-266 antenna analyser on sale.

After months of negotiation, Martin Lynch & Sons have finally been appointment as distributor for the famous FUNcube Dongle Pro, 64MHz-1.7GHz SDR receiver. This remarkable memory stick sized device was conceived, designed, built and bought to market in a lightning fast period of time by Howard Long, G6LVB. Many thousands have been sold

Britain's BIGGEST amateur radio event!

Fri 30th Sept & Sat 1st Oct 2011

NH National Hamfest

Show Highlights

- The RSGB – complete with committees and book stall
- GB4FUN
- Manufacturers stands
- National traders
- Specialist traders
- Club stands
- Special Interest Groups
- Mobile flea market
- "Bring and Buy" stand
- Local companies
- Static military vehicle display
- 2m talk-in station

Book your tickets online NOW to SAVE!

www.nationalhamfest.org.uk

Free Entry with every ticket

How to find us

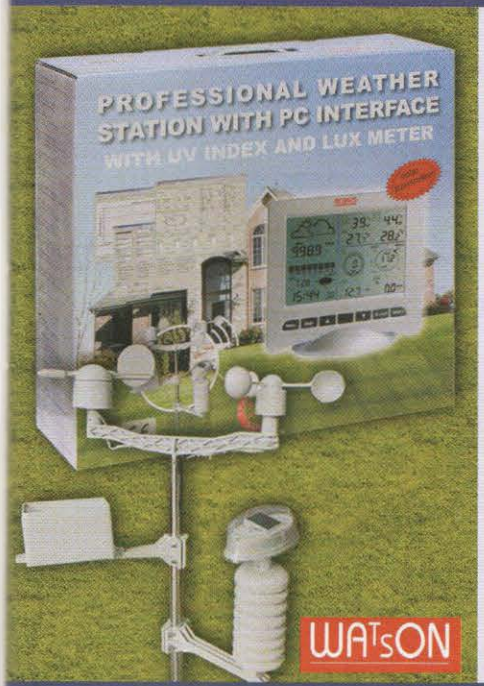
George Stephenson Pavilion, Newark & Nottingham Showground, Lincoln Road, Winthorpe, Newark, NG24 2NY

Organised by Lincoln Short Wave Club G5FZ · G8COL 1921-2011 90th Anniversary · RSGB

Many great prizes to be won!

RSGB Members' Only Offer

YOUR RSGB MEMBERS' OFFER



W-8681-SOLAR Wireless Weather Station

ONLY £84.95

SAVE £15.00

The W-8681-SOLAR is a wireless weather station that requires no connecting cable between the LCD monitor and the remote weather sensors. The wireless transmitter uses solar energy to recharge its internal AA size rechargeable batteries. This product will power all the sensors connected to it and transmit the data to the main unit. It also allows the LCD monitor to display UV Index & Light Transmitted (LUX) along with all the more usual weather conditions. The time and date are locked to the German DCF longwave atomic standard signal (can be received in UK) so the time is always right. This weather station offers amazing value and comes with everything you need to set it up in the garden.

Specifications:

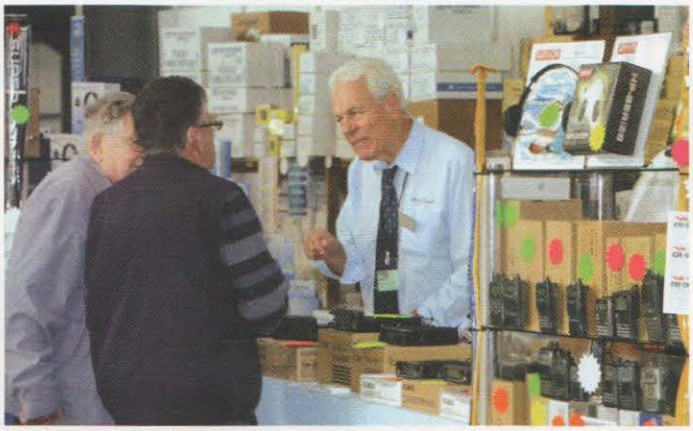
- LCD Screen
- Atomic Locked Day, Date & Time
- UV / LUX Sensor
- Indoor / Outdoor Temperature °F / °C + Max / Min
- Wind Speed & Direction
- Rain Gauge (Self-Emptying) & History
- Indoor / Outdoor Humidity
- Barometer with Trend data
- Indoor Air Pressure & History
- Weather Forecaster & Alarm
- USB Connection to PC
- "EasyWeather" PC Software Control & Data Programme
- Historic Data Storage & Display
- Frequency 868MHz (full specification online at www.rsgbshop.org)

In conjunction with Waters and Stanton RSGB members can save £15 on the usual price by paying only £84.95 + P&P for this exceptional weather station.

3 Abbey Court, Priory Business Park, Bedford, MK44 3WH
Tel: 01234 832 700 Fax: 01234 831 496
E&OE

Radio Society of Great Britain
www.rsgbshop.org

The station can be located in the Information Centre.



The National Hamfest was the chance to speak to many of the largest amateur radio dealers.

worldwide and was originally produced as part of AMSAT-UK's www.funcube.org.uk. You will be able to see the FUNcube Dongle as well as the new Wouxan KG-UVD1P/L 4m/70cm handheld on the stand.

Bonito will be bringing the recently launched RadioJet 1102S receiver that was launched at Friedrichshafen in June. This is an all new, high performance, receiver with continuous coverage from 9kHz through to 30MHz in 1Hz steps with SSB, AM, FM and stereo DRM reception modes included as standard. Performance looks exceptional with an expected sensitivity of 0.03μV and a -137dB noise floor. The receiver makes full use of digital processing techniques with a full 24-bit analogue to digital converter (ADC) for the RF sampling. The receive bandwidth can be varied between 100Hz and 24kHz and the receiver avoids the usual AGC by employing separate digital output channels, each with a different output levels. The receiver is entirely controlled via the USB port using dedicated software designed for Windows-based PCs.

Radio-Kits will be launching an HF SDR receiver kit. The design allows it to be used as a panoramic adapter in conjunction with a commercial HF transceiver.

If you are looking for batteries for portable use, Mickey's Electronics will be selling a large range of brand new 12 volt sealed lead acid batteries ideal for portable use, as well as a selection of microprocessor controlled chargers for these batteries. With no shipping costs to pay, this will result in a significant saving for rally customers.

Westlake Electronics says they will be trying to 'clear out the sheds' by packing up lots of clearance and bargain lots of items collected over 40 years of trading. These special lots will be bagged and priced to sell and clear and will include packs of connectors, cable, hardware etc. They invite visitors to the National Hamfest to 'come and have a browse!'.

MOBILE FLEA MARKET MARKET. National Hamfest 2011 organisers, Lincoln Short Wave Club and the Radio Society of Great Britain have arranged for extra outdoor space to hold the outdoor Flea Market/Car Boot sale. Many visitors to National Hamfest 2010 and 2009 said the flea market was one of the best features of the main rallies they used to visit and how much they used to enjoy browsing and haggling over the bargains. We have listened to your comments and set aside a large area in front of the huge George Stephenson Hall for the public to sell their surplus gear.

We are expecting 3000 plus visitors so if you have a shed or attic full of radio related gear you would like to turn into cash this is the ideal opportunity. If you book in advance at www.nationalhamfest.org.uk you can get a ticket for just £10 instead of £12.50 on the day. The Flea Market is strictly for the public to sell, no traders are allowed, cars must be in place by 9am and must leave the pitch at 4pm.

GRAB A PRIZE. This year, rather than the traditional raffle held on Saturday afternoon, the RSGB in association with the Lincoln Short Wave Club are organising the *free* National Hamfest 'Grab a Prize Box' (a la Crystal Maze). At 11am, 12 noon, 1.30 and 2.30 each day at least two tickets will be drawn giving those visitors change to climb into the box and 'grab a prize' from the multiple tickets being blown around inside. We have a wealth of prizes on offer as can be seen from the box on this page. Our grateful thanks to all those companies who have donated prizes for this event.

A wide variety of radios were on sale in 2010, this year will be just as good.

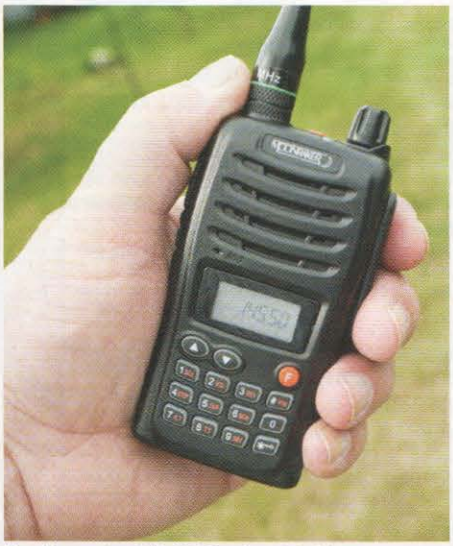
OPENING HOURS. The National Hamfest is open from 10am to 4pm on both Friday 30 September and Saturday 1 October. The outside trading area opens at 9.30am each day. Tickets are £4.50 on the gate, although discounts are available for advance bookings, see www.nationalhamfest.org.uk.

Prizes for National Hamfest 'Grab a Prize Box'

(as of 15 August)

3-element 2m Yagi (Sandpiper Aerials)
Atlas LCR (Peak Electronics)
Heil PRO-SET ELITE 6 headphones with new HS-6 mic element (W&S)
HT-90E 2m handheld transceiver (Moonraker)
IC-E80D handheld VHF/UHF D-Star transceiver (Icom UK)
Icom ID-E880 mobile VHF/UHF D-Star transceiver (Icom UK)
IC-V80E VHF FM transceiver (Icom UK)
Kenwood TH-K2ETE3 VHF portable transceiver (Kenwood UK)
Kenwood TM-D710E VHF/UHF dual band mobile transceiver (Kenwood UK)
Quansheng TG-UV2 Dual Band Handy (W&S)
SPX-100 multiband HF antenna for FT-817 (Moonraker)
SQBM100P 2/70cm dual band vertical (Moonraker)
2 x Wouxan KG-UVD1P 2m/70cm transceiver (ML&S)
2 x Wouxan KG-UVD1P/L 4m/2m transceiver (ML&S)
Yaesu FT-1900 55W 2m mobile (Yaesu UK)
Yaesu FT-60 2m/70cm 5W handheld (Yaesu UK)

Moonraker HT-90E 2m hand portable transceiver



The Moonraker HT-90E 2m hand-held.

IN THE BOX. The HT-90E is a compact and affordable FM hand portable covering the 144-146MHz VHF band and features 5 watts output, 199 memory channels plus the facility to listen to VHF FM broadcast stations.

READY TO GO. The HT-90E comes complete with everything you need to get started including a printed user manual, which is becoming a bit of a rarity these days! Power is supplied via a dedicated 7.4V 1,300mAh Li-ion battery pack that can be charged using the supplied desktop drop-in charger. The charger was well made and held the HT-90E securely whilst being charged. The charging time wasn't quoted but the review model took about 3 hours for a full charge so it's quite quick. The supplied antenna comprised a wide-range rubberised whip with an operating range of 136-174MHz. The antenna socket was a standard SMA type so it would be easy to connect other antenna systems if required.

To help keep the HT-90E safe, it was supplied with a substantial belt clip and a simple wrist strap. If you prefer to operate with a headset or fist mic, the HT-90E has a standard 2.5mm jack for the speaker and 3.5mm for the mic connection. There is also a matching fist mic available from Moonraker.

BASIC OPERATION. There is just one rotary control on the HT-90E and that's used for volume and on/off. The remaining functions are accessed and controlled via the front panel keypad. Basic tuning can be done using the up and down buttons that step the frequency using the pre-set tuning steps. These steps can be altered to any of the following: 5, 10 12.5, 25, 30 or 50kHz so that should cover most eventualities. You could also enter the frequency directly using the numeric keypad. In this case the receiver would switch to the typed frequency or the nearest multiple of the current frequency steps.

The tuned frequency was shown on the main display with a secondary (smaller) pair of digits on the right hand edge to handle 12.5kHz spacing. When using 12.5kHz spacing these cycled through 25, 50, 75 so for 145.5625 the display showed 145.56_{25}.

The HT-90E is well setup for standard repeater operation with the inclusion of CTCSS/DCS tone encoding and decoding (there's no 1750Hz tone). Like many of the HT-90E's features, tone setting was done via the Function mode. To enter this you just had to press the Function key once and you could then hit the appropriate numeric key for the function you wanted to access. To set the tones the key sequence was F 8 followed by the up and down buttons to scroll through and set the required CTCSS tone. The function menu also provided access to the repeater shift if you need to change the default 600kHz setting.

Whilst manually tuning around is fine, it's useful to be able to store your favourite channels and the HT-90E handles this with a comprehensive set of 199 programmable memory channels. In addition to storing the frequency, the memories can also hold the CTCSS tone setting as well as any repeater offset associated with that frequency.

The HT-90E also includes VOX, which is particularly handy when operating portable with a headset. The function menu provided access to adjustment of both the VOX sensitivity and delay so it was easy to set for your personal preference. The transmit power could also be adjusted from the default 5 watts down to a low power setting of 1 watt.

EXTRA FEATURES. One rather novel addition was the facility to listen to VHF FM broadcast stations. This was not exactly hi-fi but perfectly usable and worked well when combined with the 2m watch facility. When enabled, the HT-90E would monitor the last tuned 2m channel whilst receiving VHF FM. Should a carrier appear on the 2m channel the HT-90E immediately switched to that channel. I found this very useful in the shack as I could listen to the local broadcast radio station and rely on the HT-90E to keep an eye on the local repeater and switch over if anyone called.

Useful help was also available for managing the 199 memory channels. In its default state the HT-90E simply used a list of 199 consecutive channels. However, in the Special menu Options, you could switch on channel banks. This grouped the 199 memories into banks of 20 memories – ideal for grouping frequencies from a particular location. As you move locations you just have to switch banks. A bank size of 20 was more than enough to hold the local repeaters plus any simplex channels you might need. As further help for memory management, the HT-90E included a scanning facility. This provided a fast check of either all the memory channels or all those in the currently selected bank. The HT-90E's scan includes the option to choose the response when a carrier is detected. This can be: remain on channel till carrier drops, pause for a pre-set time or stop the scan. You could also skip channels and change the scan direction using the Up/Down arrow keys. In addition to scanning the memory banks you could use the Scan to step through the entire band looking for activity.

IN USE. The HT-90E feels good in the hand and the conventional PTT button on the left-hand side was very positive. The audio quality was optimised for communications and there was plenty of it so the HT-90E would be good in noisy situations. The only slightly irritating issue was the click that was emitted when the squelch lifted. This was unusually loud and a tad troublesome when dealing with a weak signal where the squelch was cutting in and out. However, in normal use it was not really a problem. I didn't measure the receiver sensitivity but in comparison with other rigs the quoted 0.25μV feels about right. On air signal reports were generally fine although several people reported that the audio level was low. I was still able to carry out QSOs and I suspect my voice was partly to blame for this – my wife's always accusing me of mumbling! However, if you're likely to be using this rig in marginal conditions it may be worth experimenting with a few different fist mics.

SUMMARY. The Moonraker HT-90E is a useful low cost 2m hand-held with a good range of features including CTCSS tones, scanning, and the facility to listen to broadcast stations. The HT-90E is available from Moonraker and 185 Maplin stores nationwide at £59.95. My thanks to Moonraker for the loan of the review model.

MOONRAKER

Manufacturers of radio communication antennas and associated products

We now accept PayPal payments online

SALES LINE 01908 281705

E-mail: sales@moonraker.eu

Web: www.moonraker.eu

PayPal

KENWOOD

Authorised dealer

Hand-helds

TH-D72E Dual band 2/70cm with GPS & APRS **£429.95**

TH-F7E Dual band 2/70cm RX 0.1-1300MHz **£239.95**

TH-K2ET Single band 2m with 16 button keypad **£169.95**

TH-K2E Single band 2m **£164.95**

TH-K4E Single band 70cm **£164.95**

Mobiles

TM-D710E Dual band 2/70cm with APRS RX 118-524MHz & 800-1300MHz, 50 Watts **£444.95**

TM-V71E Dual band 2/70cm with EchoLink RX 118-524MHz & 800-1300MHz, 50 Watts **£299.95**

TM-271E Single band 2m, 60 Watts **£169.95**

Base

TS-590S HF & 6m 100W all mode transceiver **£1,369.95**

TS-2000X All mode transceiver HF/50/144/430/1200MHz 100 Watts All mode transceiver **£1,799.95**

TS-2000E All mode transceiver HF/50/144/430MHz 100 Watts All mode transceiver **£1,549.95**

TS-480HX HF/6m 200 Watts Transceiver **£879.95**

TS-480SAT HF/6m 100 Watts Transceiver **£779.95**

Accessories

PS-60 25amp power supply unit ideal for the new TS-590S **£329.95**

SP-23 External speaker **£71.95**

SP-50B Mobile speaker **£29.95**

MC-90 Deluxe desk microphone suitable for DSP transceivers **£204.95**

MC-60A Desk microphone with pre-amplifier **£124.95**

HS-5 Deluxe headphones **£56.95**

WOUXUN

Authorised dealer

Handhelds

KG-UVD1P Great value dual band 2/70cm **£92.95**

KG-679E Superb single band 2m **£59.95**

KG-UVD1PL New fab dual band 4m/70cm handie just **£99.95**

Accessories

WO/ELO-001 Battery eliminator **£10.49**

WO/CCO-001 12v Car charger **£10.49**

WO/SMO-001 Speaker microphone **£15.49**

WO/PSO-110 Programming software **£20.49**

WO/CASE Leather case **£10.49**

TYT

TYT-800 2m 144-146MHz 5 watts 199 channels amazing **£49.95**

TYT TH-UVF1 2/70 5 watts 128 channels **£99.95**

Accessories

TYT-BE Battery eliminator **£14.95**

TYT-SP Speaker microphone **£14.95**

TYT-EP Ear piece **£9.95**

MOONRAKER

HT-90E 2m single band transceiver with full 5 watts output just **£59.95**

The HT-90E is a brilliant compact radio, perfect for beginners to the hobby. Comes complete with battery, belt clip, antenna, and rapid charger all for under £60 quid! Everything you need to get on air is in the box!

ICOM

Authorised dealer

Hand-helds

IC-E80D D-Star dual band 2/70cm handheld with wideband RX 0.495-999.99MHz **£329.95**

IC-E92D Dual band 2/70cm RX 0.495-999.9MHz with built in DSTAR **£389.95**

IC-E90 Tri band 6/2/70cm RX 0.495-999.9MHz **£239.95**

IC-T70E dual band 2/70cm handheld with 5W Tx & 700mW loud audio **£159.95**

IC-V80E single band 2m handheld with 5.5W Tx & 750mW loud audio **£104.95**

Mobiles

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

ID-1 Single band 23cm 1240-1300MHz digital and analogue DSTAR transceiver **£719.95**

IC-E2820 + UT123 Dual band 2/70cm with DSTAR fitted, 50 Watts output **£699.95**

IC-E2820 Dual band 2/70cm DSTAR compatable, 50 Watts output **£499.95**

ID-E880 D-Star ready dual band with wide band RX 0.495-999.99MHz **£439.95**

IC-2200H Single band 2m 65 watts **£229.95**

Base

IC-9100 HF/VHF/UHF All in one transceiver to 23cm (optional) – amazing! In stock NOW **£2,999.95**

IC-7800 HF/6m All mode 200 Watts Icom flagship radio **£8,995.99**

IC-7700 HF/6m 200 Watts with auto ATU transceiver **£6,399.95**

IC-7600 HF/6m 100 Watts successor to the IC-756 ..... **£3,399.99**

IC-7410 HF to 6m 100W all-mode **£1,695.95**

IC-7200 HF/VHF 1.8-50MHz RX 0.030-60MHz, 100 Watts output (40w AM) **£839.95**

IC-718 HF 1.8-30MHz RX 300kHz - 29.999MHz, 100 Watt output (40w AM) **£599.95**

IC-910H dual band with optional 23cm, 100 Watts output **£1,299.95**

Accessories

PS-125 25 amp Power supply unit **£329.95**

SM-30 Desktop Microphone designed for SSB and FM **£119.95**

SM-20 600 Ohm 8-pin deluxe base station microphone **£169.95**

SP-10 Mobile 5w speaker 4 Ohms **£54.95**

SP-22 Mobile extension speaker **£34.95**

SP-20 Base station speaker with filters **£184.95**

SP-21 Base station 3w speaker 8 Ohms **£119.95**

SP-23 Base station speaker with built in high and low pass filters **£149.95**

QUANSHENG

TG-UV2 dual band 2/70cm 5 Watts with 200 memories ..... **Only £81.95**

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

YAESU

Authorised dealer

Hand-helds

VX-8DE Triband same spec as VX-8E but with enhanced APRS **£369.95**

VX-8GE Dual band with built-in GPS antenna and wideband 100-999.90MHz Rx **£359.95**

VX-7R Tri band 50/144/430MHz RX 0.5- 900MHz, 5 Watts outut **£299.95**

VX-6E Dual band 2/70cm RX 1.8-222/420-998MHz, 5 Watts output **£239.95**

FT-60E Special offer ~~£179.95~~ now **£129.95** while stocks last

VX-3E Dual band 2/70cm RX 0.5-999MHz, 3 Watts output **£159.95**

VX-170E Last few at this price **£99.95**

FT-270E Single band 2m, 144-146MHz, 137-174MHz Rx **£104.95**

Mobiles

FT-857D All mode HF/VHF/UHF 1.8-430MHz, 100 Watts output **£679.95**

FTM-350 Dual band with Bluetooth, GPS & APRS **£479.95**

FT-8900R Quad band 10/6/2/70cm 28-430MHz, 50 Watts output **£369.95**

FT-8800E Dual band 2/70cm RX 10-999MHz, 50 Watts output **£329.95**

FTM-10E Dual band 2/70cm, 50 Watts output **£309.95**

FT-7900E Dual band 2/70cm 50/40 Watts with wideband RX **£239.95**

FT-2900E Single band 2m 75 Watt heavy duty transceiver **£139.95**

FT-1900E Single band 2m 55 Watt high performance transceiver **£129.95**

Portable

FT-897D HF/VHF/UHF Base/Portable transceiver 1.8-430MHz 100 Watts HF+6, 50 Watts 2M, 20 Watts 70cm **£789.95**

FT-817ND HF/VHF/UHF Backpack Transceiver RX 100kHz – 56MHz 76-154MHz 420-470MHz 5 Watts **£509.95**

Base

FT-DX5000MP Deluxe HF/6m all mode 200W transceiver with 300Hz roofing filter & SM-500 station monitor **£5,295.95**

FT-DX5000D Deluxe HF/6m all mode 200W transceiver with SM-500 station monitor **£4,795.95**

FT-DX5000 HF/6m all mode 200W transceiver **£4,349.95**

FT-2000D HF/6m All mode 200 Watts transceiver RX: 30kHz – 60MHz **£2,599.95**

FT-2000 HF/6m All mode 100 Watts transceiver RX: 30kHz – 60MHz **£1,999.95**

FT-950 HF/6m 100 watt transceiver with DSP & ATU RX 30kHz – 56MHz **£1,299.95**

FT-450AT Compact transceiver with IF DSP and built in ATU, HF+6m 1.8-54MHz, 100 Watts output **£719.95**

FT-450 Compact transceiver with IF DSP, HF+6m 1.8-54MHz, 100 Watts output **£639.95**

FT-450D "New" model compact transceiv er with built-in ATU **£799.95**

Accessories

MD-200A8X Ultra high fidelity desktop mic **£239.95**

MD-100A8X Deluxe desktop microphone **£119.95**

FP-1030A 25amp continuous power supply unit **£199.95**

SP-2000 Base station external speaker **£179.95**

MLS-100 High power mobile speaker **£29.95**

MLS-200 Compact mobile speaker **£26.95**

ATAS-120A Active tuning antenna system **£299.95**

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

Yagi Antennas

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

YG27-4 Dual band 2/70 4 Element (Boom 42") (Gain 6.0dBd) **£59.95**
YG4-2C 2 metre 4 Element (Boom 48") (Gain 7dBd) **£29.95**
YG5-2 2 metre 5 Element (Boom 63") (Gain 10dBd) **£59.95**
YG8-2 2 metre 8 Element (Boom 125") (Gain 12dBd) **£79.95**
YG11-2 2 metre 11 Element (Boom 185") (Gain 13dBd) **£119.95**
YG3-4 4 metre 3 Element (Boom 45") (Gain 8dBd) **£69.95**
YG5-4 4 metre 5 Element (Boom 104") (Gain 10dBd) **£79.95**
YG3-6 6 metre 3 Element (Boom 72") (Gain 7.5dBd) **£69.95**
YG5-6 6 metre 5 Element (Boom 142") (Gain 9.5dBd) **£89.95**
YG13-70 70 cm 13 Element (Boom 76") (Gain 12.5dBd) **£54.95**

ZL Special Yagi Antennas

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

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

HB9CV

Brilliant 2 element beams ... ideal for portable use

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

Halo Loops

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

HLP-2 2 metre (size approx 300mm square) **£22.95**
HLP-4 4 metre (size approx 600mm square) **£34.95**
HLP-6 6 metre (size approx 800mm square) **£39.95**

G5RV Wire Antennas

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

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

Accessories

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

Trapped Wire Dipole Antennas

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

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

(MTD-5 is a crossed dipole with 4 legs)

Multiband Mobile

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

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

Yagi Antennas

Diamond performance from the superb Diamond factory

A502HBR 6m 2 Elements, Power 400W, Gain 6.3dBi, Radial Length 3m **£99.95**
A144S10R 2m 10 Elements, Power 50W, Gain 11.6dBi, Boom Length 2.13m **£94.95**
A144S5R 2m 5 Elements, Power 50W, Gain 9.1dBi, Boom Length 95cm **£49.95**
A430S15R 70cm 15 Elements, Power 50W, Gain 14.8dBi, Boom Length 224cm **£74.95**
A430S10R 70cm 10 Elements, Power 50W, Gain 13.1dBi, Boom Length 119cm. **£59.95**

HF Mobiles

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

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

Ground Plane Free Colinear Verticals

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

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

VHF/UHF Mobiles

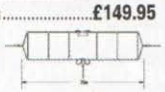
GF151 Glass Mount 2/70cm, Gain 2.9/4.3dBd, Length 78cm complete with 4m cable and PL259 ..... **£29.95**
MRM-100 MICRO MAG 2/70cm, Gain 0.5/3.0dBd, Length 55cm, 1" magnetic base with 4m coax and BNC **£19.95**
MR700 2/70cm, Gain 0/3.0dBd, Length 50cm, 3/8 fitting **£9.95**
MR777 2/70cm, Gain 2.8/4.8dBd, Length 150cm, 3/8 fitting **£19.95**
MRQ525 2/70cm, Gain 0.5/3.2dBd, Length 43cm, PL259 fitting (high quality) **£19.95**
MRQ500 2/70cm, Gain 3.2/5.8dBd, Length 95cm, PL259 fitting (high quality) **£26.95**
MRQ750 2/70cm, Gain 5.5/8.0dBd, Length 150cm, PL259 fitting (high quality) **£36.95**
MR2 POWER ROD 2/70cm, Gain 3.5/6.5dBd, Length 50cm, PL259 fitting (fibreglass colinear) **£26.95**
MR3 POWER ROD 2/70cm, Gain 2.0/3.5dBd, Length 50cm, PL259 fitting (fibreglass colinear) **£32.95**
MRQ800 6/2/70cm Gain 3.0dBi/5.0/7.5dBdBd, Length 150cm, PL259 fitting (high quality) **£39.95**
MRQ273 2/70/23cm Gain 3.5/5.5/7.5dBdBd, Length 85cm, PL259 fitting (high quality) **£49.95**

Dual and Triband Colinear Verticals

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

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

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



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

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

CHAMELEON™ ANTENNA

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

Frequency Range: 80/60/40/30/20/17/15/12/11/10/6M + 2M/1.25M/70cm (144MHz - 500MHz) + USAF MARS/CAP (3.3MHz, 4.5MHz & 7.6MHz) **£249.95**

GP2500

All Band HF Vertical

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

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

All at an amazing £229.95!

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

HUSTLER

HF Verticals

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

Hustler 4-BTV 4 Bands 40-10m 1000W Length 6.52m Weight 6.8kg **£189.95**
Hustler 5-BTV 5 Bands 80-10m 1000W Length 7.64m Weight 7.7kg **£229.95**
Hustler 6-BTV 6 Bands 80-10m 1000W Length 7.30m Weight 7.5kg **£269.95**

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

Moonraker Satellite Shop
@ M5 Communications
Moto Services Area, Junction 30 M5 South
Exeter EX2 7HF. Tel: 01392 367097
Open Mon-Thur 9-6pm Fri 9-4pm

ATV

What about the antennas?

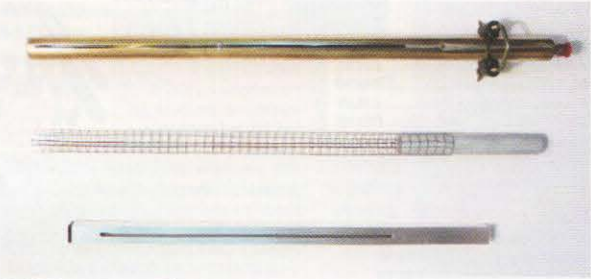


PHOTO 1: Three Alford slots. Top: traditional, brass tube with milled slot. Middle: wire mesh slot. Bottom: aluminium square section with milled slot.

THE STORY SO FAR. Starting with a simple introduction to amateur television, we've looked at the basics, practical minimal test equipment and methods for the setting up of transmitters and receivers. This was followed by suggestions to help produce an analogue 23cm ATV station. A few more useful things could be added – a mic amp, video mixers, ID/test card generator and so on. But we haven't looked at the last *essential* item: the antenna.

Being without an antenna is a very serious limitation. There are a number of antennas types that can to be considered for 70cm, 23cm, 13cm and additional bands up to at least 3cm. As promised (some time ago!) I will be producing a separate article, Antennas for ATV, to cover these bands, but this is still work in progress.

WHAT ANTENNAS ARE OF INTEREST?

There are basically four groups:

- omnidirectional, low gain
- compact beam antennas of medium to high gain, which would include what is widely known as the 'plate' antenna and, in its simplest form, the 'double diamond'
- wide band Yagi beams of medium to higher gain
- waveguide, horn & parabolic dish antennas, predominately for the higher frequency bands (eg the waveguide horn antenna in the January & February 2011 *RadCom*).

Most of these antennas are complex and require much detail, so it is difficult to present full construction information on this page. But one antenna can be shown right now.

THE ALFORD SLOT. This antenna is often used by ATV repeaters. It is near-omnidirectional and comes in several variants of construction method and performance/gain, as seen in **Photo 1**.

The top example in Photo 1 is a 23cm Alford slot made from brass tubing with a measured 6dBd gain in the vertical plane. Its omnidirectivity is no worse than -2dB. **Figure 1** shows the radiation patterns of the antenna. The maximum gain is looking directly into the slot and, whilst not intuitive, the slot should be vertical for horizontal polarisation. There is limited advantage using copper tubing and the use of aluminium has several advantages. The tube does not even have to be made of solid material – the middle version of the Alford slot in Photo 1 is made from 12.5mm (½") square mesh galvanised sheet, available from some hardware stores and garden centres. This can be rolled by hand around a slim broom handle or similar and is easy to solder. The slot is formed by the meeting of the two edges of the mesh sheet. Typical pre-rolled sheet for the 23cm example in Photo 1 is 7 'squares' by 47 'squares'.

Although not quite the same design as the other two, the third example in Photo 1 is made from standard aluminium square stock and is included to highlight that the 'tube' does not have to be round. It is important that the 'circumference' of the square section is no more than that for a round version. A great advantage of this version is that it is easy to clamp whilst machining the slot. *With great care* it can be done with an electric machine router using a 5mm 'end mill' metalworking bit, but this is not a technique for metalworking novices.

Several design rules apply. Being a waveguide fed/backed 'slot', the waveguide must have a particular dimension. In particular, the 'slot' has a specific width and, when centre fed, the maximum slot length limit is 2.2 wavelengths. This minimises radiation pattern break-up. The traditional round waveguide diameter should be no more than 0.1 wavelengths for good omnidirectivity. **Figure 2** and **Table 1** give dimensions for tube and mesh versions of the antenna that give 6dBd gain.

The centre point impedance of a 2λ slot is typically 100Ω with a series reactance. By extending the slot to 2.2λ this reactance is 'tuned out'. For the usual 50Ω termination the slot feed requires a 2:1 balun (balanced to unbalanced converter). **Figure 3** shows the detail of a suitable balun by modifying the end of a piece of 0.141" semi-rigid coax cable such as UT-141. A plastic sleeve made from the outer cover of a 5mm coaxial cable provides fine adjustment of the match.

The 2.2λ mesh version is the same as the solid tube for all the electrically sensitive dimensions.

CORRECTION. In the July ATV column, the loss between two dipoles 1 wavelength apart was incorrectly stated as 32.5dB. In fact it is 18dB. Sorry for the confusion.

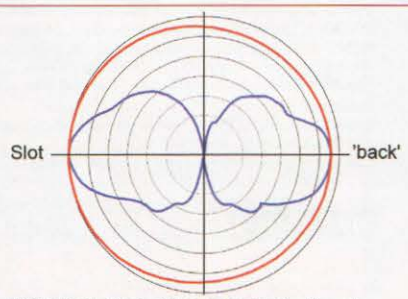


FIGURE 1: Plot of the azimuth (red) and elevation (blue) radiation patterns of a typical Alford Slot antenna. The rings are 5dB apart and the slot is facing left.

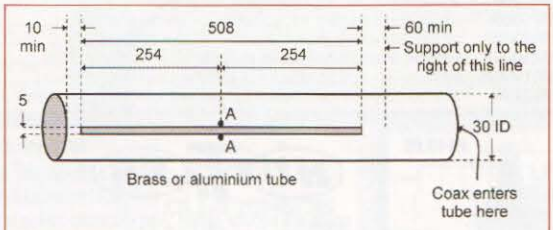


FIGURE 2: General design of Alford Slot. Dimensions in mm; not to scale.

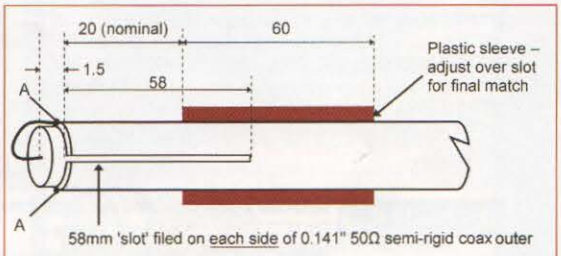


FIGURE 3: Semi-rigid cable 2:1 balun. Dimensions in mm; not to scale. Connect points A to feed points A on the Alford Slot.

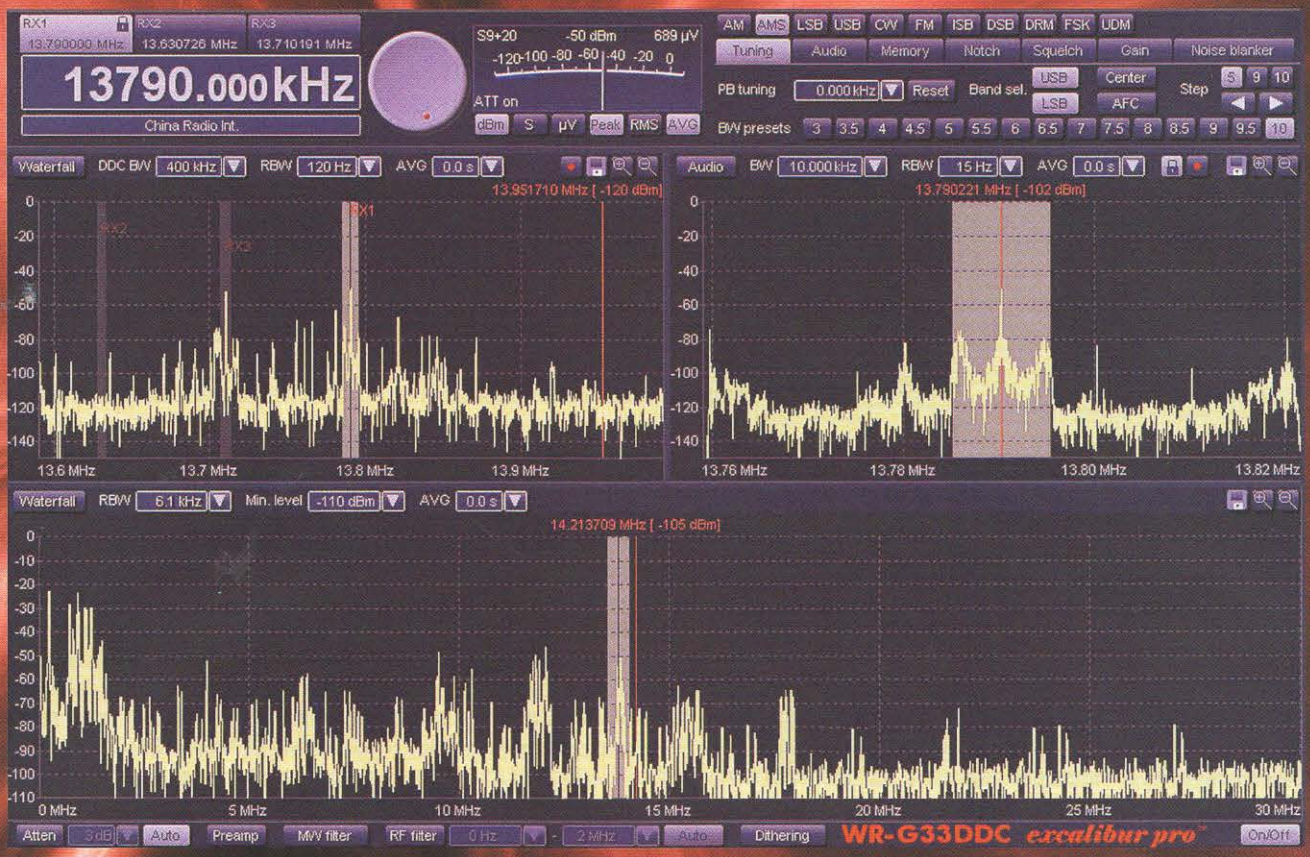
TABLE 1: ALFORD SLOT DIMENSIONS FOR TUBE & MESH VERSIONS.

Overall tube length	Top to slot	Slot length	Slot width	Slot to bottom	Tube dia.
725mm	10mm	508mm	5mm	*	30mm

* When supporting the antenna the 'clamping area' should be at least 60mm from the bottom of the slot. The feed connection is at the mid-point of the slot.

The blade just got sharper

with EXCALIBUR Pro™



- 9 kHz to 49.995 MHz frequency range
- Direct sampling, digital down-conversion
- 16-bit 100 MSPS A/D converter
- 50 MHz-wide, real-time spectrum analyzer
- 4 MHz recording and processing bandwidth
- Three parallel demodulator channels
- Waterfall display functions
- Audio spectrum analyzer
- Audio and IF recording and playback
- Recording with pre-buffering
- EIBI, HFCC and user databases
- Very high IP3 (+31 dBm)
- Excellent sensitivity (0.20 µV SSB)
- Excellent dynamic range (107 dB)
- Configurable preselection filters
- Test and measurement facilities
- USB 2.0 interface
- Affordable, easy to install and use

Just when you thought the bar was raised high enough with our award-winning Excalibur receiver, here comes a serious competitor - the Excalibur Pro. With its unparalleled 4 MHz processing and recording bandwidth, laboratory-grade measurement facilities and many other new features, this is a receiver that will surely be making waves - not just receiving them! For more details, see:

www.winradio.co.uk/epro

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

Antennas

Downsizing, the G4LQI multiband antenna and a planning saga

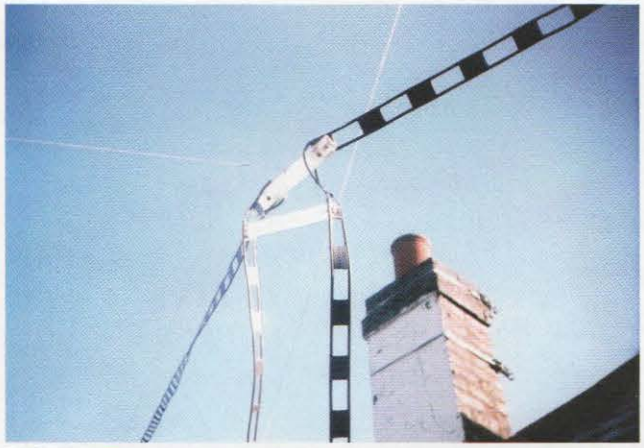


PHOTO 1: The arrangement of the feeders used in the G4LQI quad-plane antenna.

GETTING SMALLER. With advancing years, many of us are faced with the prospect of having to downsize. My garden is over 200ft long and 40ft wide (61m x 12m), has a large hedge running the full length of it plus trees and lawns. This poses maintenance tasks that are within my capabilities now – but will I be able to handle it 5 years hence? If I moved, I would miss my multiband quad and all the space for making and testing antennas.

The XYL is talking about a bungalow with a modest garden, which doesn't appeal to me at all. Erwin David, G3LQI e-mailed me with a possible solution. He says, "With old age creeping up, we had to move from our beachfront house to a 3rd (top) floor flat, albeit one with a wrap-around balcony. Gone is my 500W linear; I would not dare to use one in an apartment building and anyway I could not lift it any more.

"I am pleasantly surprised by what quarter-wave whips on the balcony railing counterpoise will do from 14MHz up. On 7MHz I just have a 10m wire, 7m from that railing up at a slant to the top of a flagpole and 3m down in another direction. With my 100W I can work all I can hear. Bottom-loaded with 23 turns on a 3in red Amidon toroid, that wire can be made to resonate on 3.7MHz. I have even been able to check into the Trans Canada PowWow Club (3.75MHz SSB at 0500Z, the control station in Central Ontario using a four-square) when conditions are halfway decent."

THE G4LQI QUAD-PLANE MULTIBAND HF ANTENNA Also contained in G4LQI's e-mail was a description of an antenna he had used at his previous QTH, which you might find useful. It is described as a quad-plane multiband HF antenna with a bonus. The upper half of the antenna is a quad loop. The lower half comprises horizontal radials or counterpoises, which makes an excellent space and height saving antenna. It is essentially a vertically polarised DX antenna but with additional characteristics. This antenna arrangement has the following advantages:

- Shack-tuneable 3.5 to 30MHz with vertically polarised broadside radiation on all bands
- No outdoor pruning, tuning or weatherproofing
- Two shack-selectable horizontally polarised 'bonus' modes of operation, created by judicial arrangement of feeders.

The physical dimensions and layout are shown in **Figure 1**. The antenna was constructed using 1.5mm PVC-covered stranded copper wire. The feeders are of 450Ω slotted twin lead, chosen because of the greater strength of its Copperweld wire, although 300Ω slotted twin lead would serve the same purpose. Where two twin leads run parallel with each other they can be spaced anywhere from 2 to 15cm using spreaders, as shown in **Photo 1**. Enough spreaders should be used to roughly maintain the chosen spacing in rough weather. The feeders should also be kept away from energy-absorbing walls by several times the chosen spreader length.

MODES OF OPERATION. The various modes of operation of this antenna are shown in **Figure 2**. Mode 'A' is the basic 'quad-plane', which is vertically polarised and good for East/West DX on bands 7-28MHz. It's also good for ground wave 28 & 29MHz. The 9m leg length was chosen to have a vertical component of approximately 5/8 wavelength on 29MHz. This size fitted the available space and promised efficient quad operation on all bands from 7 to 29MHz. It can be tuned to 3.5MHz, but inadequate leg length and wire size means that it is not an efficient radiator on this band.

In mode 'B' the antenna is a horizontally polarised delta loop consisting of the two upper quad-plane legs and one side of each feeder. G4LQI found this mode useful for European contacts on 14 & 21MHz and occasionally for DX reception in heavy local QRN.

In mode 'C' the

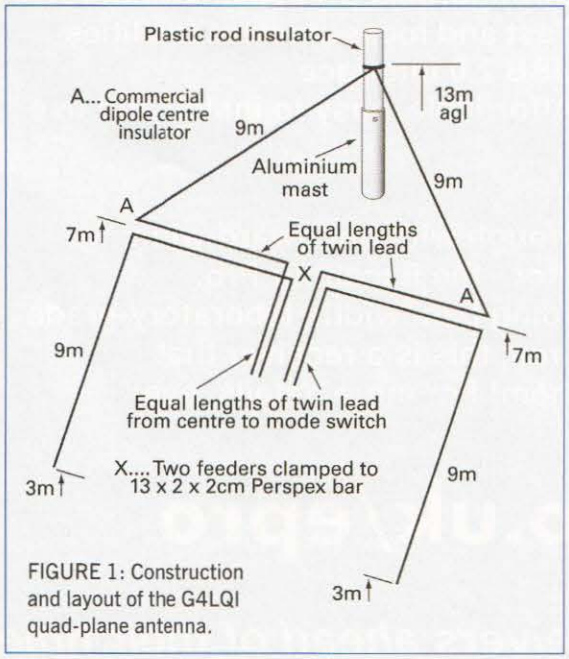


FIGURE 1: Construction and layout of the G4LQI quad-plane antenna.

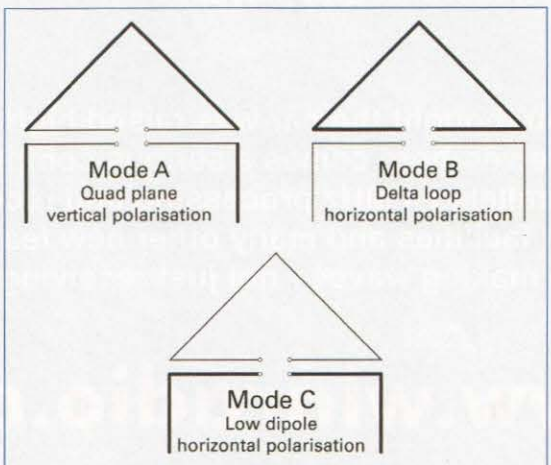


FIGURE 2: The three modes of operation (A, B and C) of the G4LQI antenna.

antenna is a low horizontal U-shaped dipole consisting of the 'other' side of each feeder, end-loaded by the lower legs of the quad-plane. This results in a 30m long centre-fed wire which is effective for short skip on 3.5 & 7MHz.

The feeders entered the shack through two 38mm PVC conduits inserted through the brickwork. Each conduit was capped on both ends. A slot to fit the twin lead was cut into each cap. After installation of the feeders all outside openings were sealed with bathtub sealer.

The mode switch was located just inside the feeder entrance. G4LQI used a receiver-sized ceramic switch, which withstood 400W PEP without problems. A four pole-switch with at least three positions is required.

This antenna used a balance feed, so an ATU designed for balanced feeders was required. G4LQI used a KW E-Zee match, which provided a good match on all bands. He cautioned against using an unbalanced tuner with a ferrite or powdered iron core balun on the grounds that these types of baluns are generally not suitable for the high impedance levels encountered in this system on some bands. He recommends an air-wound type.

I had heard of this concern before so when I went on holiday (see below) with an IC-706 and a simple centre fed antenna I wondered how the diminutive MJF-901B ATU would cope, because it had a very small toroid ring transformer balun. After several hours operation on several bands I checked out the balun and it was just slightly warm. I wondered if it was doing anything, so I bypassed it – and got an RF 'bite' from the ATU chassis for my efforts.

So how did the quad-plane antenna work out? G4LQI says it's "very hard to compare the new system with something that one had to tear down to make room for the new. I previously had a full-size G5RV on the same masts, which I also used as a top-loaded vertical for DX on 3.5MHz, a VK2ABQ beam for 14, 21 & 28MHz, 8m high. I missed neither for my DX working, most of which was towards the West. Short-skip around Europe and local working were well provided for."

HEIGHT MATTERS. Some years ago I operated from a 5th (top) floor apartment in Eindhoven. I was using a single band (14MHz) homebrew transceiver running about 80W and I used a simple dipole stuck out over the balcony using a bamboo stick. It worked exceptionally well.

More recently I operated from Marrakech from a hotel room. It wasn't a tall building; it had just three floors. The shack was located on the top floor and there was a flat roof above. I installed a 20m long wire supported in the centre with a telescopic fishing pole I had brought with me for the purpose. I fed the wire in the centre with 400Ω ladder line. The rig was an IC-706 and the antenna was fed using an MJF-901B ATU. Again, this worked very well.

My view is that it is much more important *where* an antenna is than *what* it is. If you are planning to downsize, a location with a bit of height might be the answer, but do check out the restrictions on putting up antennas.

PLANNING RESTRICTIONS. While on the subject of planning restrictions, many years ago I was forced into applying for planning permission on my antenna mast after a complaint from a distant neighbour. This planning application was refused because of the activities of this neighbour, who orchestrated opposition. I did eventually obtain planning permission on appeal, although it had a couple of restrictions. One of these was that the mast must be folded down during the hours of daylight. I objected on the grounds that this meant it had to be raised and lowered in the dark, which posed a safety issue. The council changed the wording so that the mast could only be raised during hours of darkness plus one hour after sunrise and one before sunset! I went along with it, knowing that such a restriction is nearly impossible to police.

I live on a private estate. Most of the neighbours are elderly/retired and I get on very well with most of them. Over the years, all those who made lots of noise about my antenna, including the original complainant, have died. Since then I have had no problems, although I am not sure whether it is a case of indifference or fear that the Curse of the Multi-band Quad will strike again.

The fold-over mast is counterweighted so that it can be folded over or raised in about 30 seconds using a rope – no winch is required. The multiband quad currently fitted to this mast, shown in **Photo 2**, can be used when the mast is folded over, in which case it is vertically polarised (although it can only beam north or south). The most noticeable characteristic if the antenna in the vertical polarised mode is that it is that the noise level is higher and the signals from the numerous short skip stations are weaker.

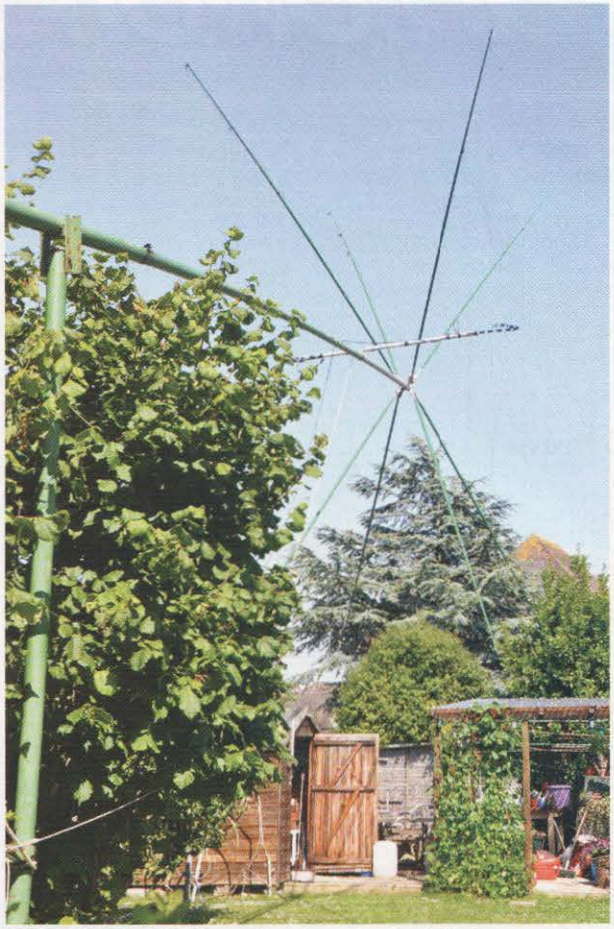


PHOTO 2: The G3LDO multiband quad on the folded over mast.

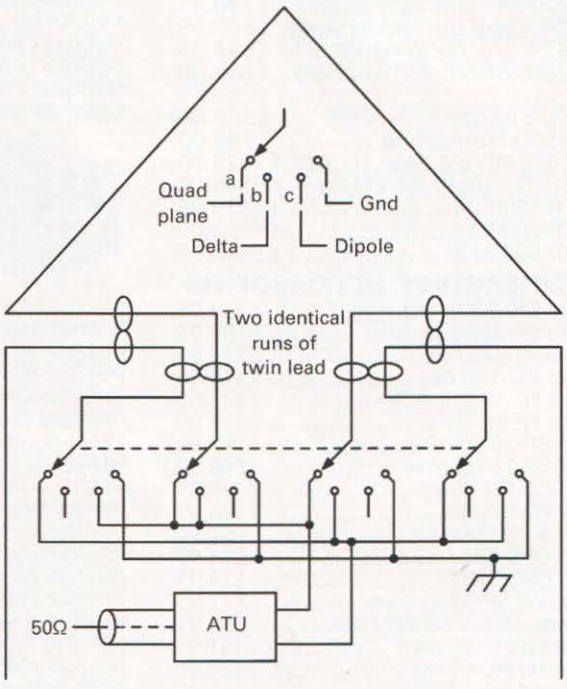


FIGURE 3: The mode selection switch used in the G4LQI quad-plane antenna. The 'earth' position is optional.

Tel: 01922 414796

Established 1997

Radioworld communications

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

HF/VHF/UHF transceivers

TM-D710E VHF/UHF mobile ... £439.00.
TS-480SAT - HF&6m 100W..... £754.99.
TS-480HX - HF & 6m 200W.... £859.00.
TS-2000 - HF/6/2/70cms ..... £1468.00.
TS-2000X-HF/6/2/70/23cm... £1749.00.
TM-V7E - 2m/70cm's ..... £376.00.
TH-F7E - 2mtrs/70cm's ..... £235.00.
TH-D72E 2/70/GPS ..... £424.95.
TM-271E-2m/FM Mobile ..... £165.95.
TM-V71E - VHF/UHF ..... £289.00.
IC-7410 HF/6m base ..... £1695.95.
IC-9100 NEW HF/6m base ... £2895.99.
IC-7600 HF 6m transceiver....£3189.00.
IC-7700 HF & 6m Base ..... £5995.00.
IC-7800-2 HF/50MHz 200W.....£8875.00.
IC-7200 HF+6m 100w .....£799.00.
IC-7000 - HF/6m/2m/70cm's.....£1149.00.
IC-718 - HF 100W.....£569.00.
IC-910H - 2M 100W/70cm 75W £1275.00.
IC-E91 - Top Flight Handheld....£259.95.
IC-E90 - 2m/6m/70cm Handheld £238.99.
IC-E2820 Dualband VHF/UHF ....£478.99.
ID-E880 2/70 digital mobile .....£433.00.
IC-E92D D/STAR handy ..... £387.00.
IC-V80E 2M handheld ..... £109.00.
ID-1 mobile TRX 23CM/FM..... £714.00.
IC-T70E 2M/70CM Handy ..... £158.00.
IC-E80D D-Star V/U ..... £320.00.
PW-1 HF Amp 1KW ..... £5055.00.
FT-950 HF Transceiver..... £1269.00.
FTM-10E - VHF/UHF tx/rx ... £309.00.
FT-897D - HF/6m/2m/70cm.. £779.00.
FT-817ND - 1.8-430MHz 5W. £509.00.
FT-857D - HF/6m/2m/70cms £679.00.
FT-7900 mobile VHF/UHF ..... £239.00.
FT-8800E - 2m/70cm mobile. £329.00.
FT-8900 - 10m/6m/2m/70cm. £369.00.
FT-1900 - 2m 55W mobile.. £133.00.
FT-2900M - 2m 75W mobile.. £138.95.
VX-7R - 6m/2m/70cm handy. £299.95.
VX-6E - 2m/70cm handheld.. £249.95.
VX-3E - 2m/70cm handheld.. £169.00.
FT-60E - 2m/70cm FM 5W .. £129.95.
VX-8DE handy with APRS ..... £369.00.
FT-450D transceiver ..... £799.00.
FT-2000 HF/6M Base 100W... £2119.00.
FT-2000D 200W HF/6M Base £2599.00.
FT-DX5000 ..... £4339.95.
FT-DX5000D ..... £4892.00.
FT-DX5000 MP ..... £5400.00.

Transceiver accessories

Yaesu SM-5000 monitor ..... £459.95.
Yaesu SP-2000 speaker ..... £157.95.
Yaesu MD-200 mic ..... £234.95.
Yaesu MD-100 mic ..... £119.00.
Yaesu FC-30 ext. ATU ..... £223.95.
Yaesu FP-30 PSU..... £215.00.
Icom SP-20 speaker ..... £197.99.
Icom SP-21 speaker ..... £98.99.
Icom PS-126 psu ..... £449.95.
Icom PS-125 psu ..... £326.99.
Icom RMK-7000 kit ..... £57.50.
Icom OPC-581 ..... £34.49.
Icom OPC-589 ..... £19.95.
Kenwood SP-23 speaker ..... £71.95.
Kenwood HS-5 headphones ..... £55.99.
Kenwood MC-90 mic ..... £191.99.
Kenwood MC-60 mic ..... £120.00.
Kenwood MC-58DM mic ..... £56.95.
Kenwood MC-43 mic ..... £20.99.

MFJ Enterprises

MFJ-989D 1500W Auto ATU..£399.95
MFJ-986C 3Kw HF.....£359.95
MFJ-993B dual 300/150 Auto £254.95
MFJ-991B Auto Intellituner....£214.95
MFJ-976 1500w ATU £479.95
MFJ-969 300w Rollercoaster £219.95
MFJ-962D 1.5Kw Inductor.....£299.95
MFJ-949E 300w W/D-Load....£184.95
MFJ-948 300w HF.....£164.95
MFJ-945E Mobile £134.95
MFJ-941E 300w £144.95
MFJ-934 ATU+AG £204.95
MFJ-921 2m ATU.....£98.95
MFJ-924 70cms £98.95
MFJ-914 Extender £90.95
MFJ-901B 200w Versa tuner....£111.95
MFJ-1026 Active Antenna £204.95
MFJ-267 Dummy Load / SWR - £162.95
MFJ-802 Field Strength Mtr..... £55.95
MFJ-249B 1.8-170 Dig.....£264.95
MFJ-259B 1.8-170 .....£269.95
MFJ-269 HF/VHF/UHF £369.95
MFJ-201 grid dip meter.....£154.95
MFJ-269PRO 1.8-170&430-520 £389.95
MFJ-250 1kw Oil filled £78.95
MFJ-250X 1KW without oil £56.95
MFJ-260C 300w PL259 .....£45.95
MFJ-260CN 300w N-Type £54.95
MFJ-264 1.5kw PL259 .....£77.95
MFJ-264N 1.5kw N-Type £84.95
MFJ-267 Load/VSWR £162.95

RigExpert ®

AA-500 analyser 5 to 500 MHz .. £574.00.
AA-54 HF ANALYZER ..... £322.96.
RigExpert AA-230 ..... £514.95.
AA-230PRO ..... £574.95.
RigExpert AA-30 - HF Analyzer .. £274.95.
RigExpert AA-520 Analyzer ..... £574.95.
RigExpert Plus .....£262.95.
RigExpert Standard .....£190.95.

HEIL SOUND Microphones & Headsets

PR-781-PTT deluxe base mic...£169.96.
Pro-Set-Plus Headset .....£224.95.
Pro-Set-Plus-IC Headset .....£239.95.
Pro-Set-IC Headset .....£159.95.
Goldline GM-4 Stick mic .....£149.95.
Goldline GM-5.1 Stick mic .....£149.95.
HM-4 Handy mic w/HC-4 insert £82.95.
HM-IC Handy mic + Icom insert £99.95.
HM-10-4 Hand mic + HC-4 .....£79.95.
PR-20 hand microphone £129.95
PR-30 hand microphone ..... £229.95.
PR-40 hand microphone ..... £269.95.
Pro-Set-Elite with HC6 ..... £179.95.
Pro-Set-Elite-IC with HC-6 ..... £189.95.
Pro-Set-6 with HC-6 ..... £149.95.
HM-Pro mic ..... £99.95.
Pro-Set Media ..... £129.95.
AD-1 adapters from ..... £22.95.
CC-1XLR leads from ..... £37.96.

COMET

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

Tigertronics

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

WATSON

POWER-MITE NF 22A peak £79.95
W-25AM 25A Supply £92.95
W-10AM 10A Supply £59.95
W-5A 5A Supply £29.95
W-10SM 10A Supply £49.95
W-30 2/70 Base £49.95
W-50 2/70 Base £54.95
W-300 2/70 Base £74.95
W-2000 6/2/70 Base £89.95

butternut

Butternut HF-2V 40/80m £299.95
Butternut HF-6V 80-10m £399.95
Butternut HF-9V 80-6m £449.95
Butternut HF-5B 20-10m £469.95
STR-II radial kit £159.95

HUSTLER

Hustler 5-BTV £229.95
Hustler 4-BTV £189.95
Hustler 6-BTV £269.95
Hustler RM-10 10m resonator £21.99
MO-1 mobile mast section £39.95
MO-2 mobile mast section £39.95
MO-3 mobile mast section £29.95
MO-4 mobile mast section £27.95

PALSTAR

AT-1500DT 1500w ATU £534.95
AT-2K 2000W ATU £594.95
AT- Auto 1500 Watt ATU £1129.95
AT5K 3500 Watt ATU £999.95
DL-5K 5kw dummy load £424.95

Miracle Antenna

Miracle Whip QRP allband £129.95
Miracle Ducker IL ATU..... £139.95
Miracle Ducker PL for HF £139.95
Miracle Ducker TL HF/VHF/UHF ... £139.95

AT-1000 Pro

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

£499.00

Z-100 Plus

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

£134.99

DM-7800

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

£136.00

AT-100 Pro II ..... £189.95.
AT-200Pro ..... £209.99.
AT-897+ ..... £178.00.
KT-100 ..... £173.00.
AT-600Pro ..... £299.95.
YT-450 ..... £224.95.
Z-11ProII ..... £159.95.
YT-100 ..... £177.00.
FT-Meter ..... £44.00.

Z-817 ATU

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

£120.00

LDG IT-100

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

£158.95

LDG RBA 1:1&4:1

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

£35.00

LDG ELECTRONICS

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

LDG ELECTRONICS

TONNA

Tonna 220505 6m 5el ..... £118.95.
Tonna 220809 2m 9el ..... £79.95.
Tonna 220811 2m 11el ..... £114.95.
Tonna 220817 2m 17el ..... £148.95.
Tonna 220909 70cm 9el ..... £74.95.
Tonna 220919 70cm 19el ..... £94.95.
Tonna 220921 70cm 21el .....£119.95.
Tonna 220635 23cm 35el ..... £93.95.
Tonna 220655 23cm 55el ..... £119.05.
Tonna 220745 13cm 25el ..... £102.95.

WEST MOUNTAIN RADIO

RIGblaster Pro ..... £299.95.
RIGblaster Plus USB ..... £159.95.
M4-CBL RG45/4Pin lead ..... £18.95.
RIGRunner 10way 12v distribution board £159.95.
CBA-III Computerised Battery Analyser ... £149.95.
CBA/AMP/240 CBA-II Amplifier ..... £719.95.
PG-40S 12V Backup Power System ..... £144.95.

DIAMOND ANTENNA

HF10FX 10m Mobile ..... £49.95.
HF15FX 15m Mobile ..... £49.95.
HF20FX 20m Mobile ..... £49.95.
HF40FX 40m Mobile ..... £49.95.
HF80FX 80m Mobile ..... £52.95.
CR8900 10/6/2/70 ..... £112.95.
CP6 Base 6m-80m ..... £389.95.
X50 Base 2/70 ..... £82.95.
X200N Base 2/70 ..... £129.95.
X300 Base 2/70 ..... £149.95.
X7000 Base 2/70/23 ..... £255.95.

AMERITRON

The High Power Specialist

AL-811XCE 10-160m 600w £899.95
AL-811HXCE 10-160m 800w £999.95
ALS600X Solid State 10-160m 600w £1499.95
AL-1500XCE 10-160m 1.5KW £3769.95
AL-1200XCE 10-160m 1.5KW £3499.95
AL-82XCE 10-160m 1.5KW £2749.95

RADIO WORKS

CW-160 160-10m (252ft) £165.95
CWS-160 160-10m (133ft) ... £159.95
CW-80 80-10m (133ft) £134.95
CWS-80 80-10m (66ft) £152.95
CW-40 40-10m (66ft) £121.95
CW-40+ 40-10m (66ft) £142.95
CW-20 20-10m (34ft) £104.95
G5RV+ 80-10m £82.95
G5RV-XF Fullsize £71.95
G5RV-XH Halfsize £56.95

SGC

SGC-230 HF..... £529.95
SGC-500 HF £1399.95
SGC-235 HF-500w £1199.95
SGC-237 HF+6m £309.95
SGC-237 Porta £559.95
SGC-237 PCB £349.95
SGC-239 HF..... £199.95
MAC-200 ..... £279.95

Rotators

G-2800SDX Rotator ..... £850.00.
G-450C Rotator ..... £314.95.
G-550C Rotator ..... £295.00.
G-650C Rotator ..... £355.00.
G-1000DXC Rotator ..... £459.95.
G-5500C Rotator ..... £584.95.
AR-35X Hy-Gain rotator.....£99.95.

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£139.95 per 100m Drum

RG58U ..... £0.70 per Metre
RG8 Super ..... £1.00 per Metre
RG213 ..... £1.36 per Metre
W103 Westflex ..... £2.00 per Metre
RG-8 100 Metre Drum £70.00
Flexweave 50m Flex £30.95
Flexweave-PVC-50 50m £40.95
Enamelled Copper Wire 50m . £17.95
Hard Drawn Copper Wire 50m £24.95

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

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

FlexRadio Systems

Software Defined Radios

FLEX-1500 SDR Transceiver... £579.95
FLEX-3000 SDR £1299.95
FLEX-5000A Transceiver £2495.95
FLEX-5000A-ATU £2795.95

Telecom linear amplifiers

Self-contained, solid state

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

Cushcraft

X-7 - 20/15/10 7EL Yagi. .... £899.95.
A3S - 20/15/10 3EL Yagi .....£629.95.
A4S - 20/15/10 Yagi .....£699.95.
A3WS - 12/17 3EL Yagi .....£499.95.
ASL-2010 13-32MHz Log ..£999.95.
MA5B - Mini Beam .....£529.95.
D-3 - 20/15/10 Dipole .....£359.95.
R-6000 - 6Band Vertical ... £449.95.
R-8 - 40-6m Verical .....£559.95.
MA5VA - 10/20m Vertical ....£309.95.

Second Hand List

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

Accessories
MFJ-722 CW / SSB Filter £59.00
Yaesu FRV-8800RX VHF Converter £99.00
SEM TranZmatch with Ezi-Tune £89.00
Alinco DJ-X3 £89.00
Comet CF-BPF 6 band pass filter £30.00
EDC-16B adapter £9.99
Kent Straight Key £45.00
WELZ DL-600Dummy Load £68.95
50-Watt Dummy Load £56.95
TS-711/811PX Interface £59.95
Kenwood YK-88S SSB Filter £49.00
Kenwood VS-2 Voice Synthesizer £59.00
Kenwood VS-1 Voice Synthesiser £39.00
SGC MAC-200Antenna Controller Auto-Tuner £220.00
MFJ-784B DSP Filter £219.00
Icom ut-102 Voice Synthesizer Unit £25.00
AOR AR0900Digital Voice Interface. £126.31
Midland 48 Plus Multi £69.00
MFJ-1817 2m/70cm Telescopic Rubber Duck 3£22.00
Icom PS-85Icom 20A 13.8V Switch Mode £159.00
DCW-15B SSB ELECTRONICS Sequencer £55.00
Kenwood DFC-230 digital frequency controller £89.00
Kenwood YK-88SN SSB Filter £49.00
Kenwood YG-455C-1 - CW Crystal Filter £89.00
Kenwood YG-455CN-1 - CW Crystal filter £100.00
Kenwood YK-88CN CW Filter £50.00
LDG-FT-Meter SWR, modulation, ALC £35.00
SC-45Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
010-10117-02 Garmin GPSCarry Case £5.00
FT-290/790MKI Carry Case £15.00
HS-800/PRO High Sierra Standard Control Box £75.00
CFX-514 Triplexer £35.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
Eton S-350Field Radio £65.00
Bremi BRL-5 3-way switch + 5Watt dummy load £20
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Yaesu SC-1 Station Console £89.00
Icom CR-293 High Stability Crystal Unit £80.00
Dee Comm Dummy Load £69.00
BRV-1 Mirror Mount £10.00
Yaesu CSC-92 soft case £10.00
60W Max Dummy Load £35.00
300W Max Dummy Load £79.00
BP-262 Battery Case £7.00
Drake DL-300Dummy Load £50.00
Revex L2050Ohm Dummy Load £25.00
MTU-30/20RF u-tuning Unit C £500.00
MTU-80/40RF u-tuning Unit B £500.00
Bush Sunrise Radio £49.95
KIF700Keyboard & Interface £69.00
SC-37 Soft Case £6.00
SC-41 Soft Case £6.00
Diamond DL1000Load £99.00
CT-5000CTCSS Board for AR-5000£60.00
ICOM HM-175GPS hand microphone £120.00
Philips HC8349 Wireless Headphones £25.00
BC-177 Desk top charger for IC-E92 £35.00
Toyo T-100Dummy Load £59.95
MAG-BM145PL £14.95
MFJ-332B BNC Magmount £15.95
FMU-747 for FT840, FT-747 etc. £69.00
SU-1 Barometric Pressure Sensor Unit for £29.95
Yaesu XF-8.9KCN CW filter £40.00
Inrad Pre-amp board to fit FT-1000mp £57.50
TI-30D 15-Watt Load £20.00
Hansen DL-2015-Watt Load £20.00
Icom UI-8 FM Demodulator Board £60.00
Garmin GPS-38 Personal Navigator £49.00
FM Wide Modification Kit for FRG-8800£60.00
AirNav RadarBox-Pro 2010£299.00
AN-3 Three Way Antenna Switch £15.00
Heathkit IM-5217 Meter £30.00
SSB-SP-2000 2m Masthead Pre-amp £159.00
SSB-SP-7000 70cm Masthead Pre-amp £189.00
2-way Coax Switch (SO-239) £8.33
Daiwa CS-401 4-Way Antenna Switch £39.00
Trio CO-1303D Oscilloscope £40.00
Kenwood CS-4025Dual Trace Oscilloscope £139.00
Icom UT-84 Tone Squelch Board £49.00

Amplifiers
Tokyo Hy-Power HL-50B 80m-6m Linear £269.00
Kenwood VB-2200GX 2M Amplifier £79.00
Explorer 10001KW HF Amplifier £799.00
Ampere APB-57A UHF Amplifier £129.00
MML 144/30-LS 2m 30W Amplifier £89.00
R-25Microset 30W 2m Linear Amplifier £89.00

Analyzers and SWR meters
Daiwa CN-101 1.8-150MHz SWR Meter 15w-1.5kw £55
Kenwood SW-200 £79.00
Harrier SWR-1 SWR & Power Meter £15.00
TOYO T-430SWR £39.00
Kenwood SW-2100SWR Power Meter £99.00
Welz SP-10X HF+2m SWR Meter £30.00

Antenna
Wellbrook Indoor Receiving Loop £149.95
EZ-TUNE-7000IBOX High Sierra Control box for £85.00
MC-4MT Mobile Cable £13.00
Heathkit HD-1424 Active Preselector £59.00
Arno 40m EH Antenna £99.95
Telescopic 4m Band Whip £15.00
2m Telescopic Antenna £10.00
Wideband Scanner Antenna £15.00
Wideband Base Scanner Antenna £15.00
Desktop Discone £25.00
Wellbrook ALA330Receiving Loop £174.95
Antenna Rotators
KR-600RC Rotator £220.00

Antenna tuners
Yaesu FRT7700 Antenna Tuner £69.00
Global AT-2000 SWL ATU £79.00
MFJ-994B 600Watt IntelliTuner Automatic ATU £275.00
Yaesu FC-30 Antenna Tuner Unit £159.00
LDG AT-897 Autotuner £149.00
AT-200PRO Autotuner £159.00
Vectronics VC-300D Tuner with LED PEP Meter £199.00
MFJ-929 Compact 200Watt IntelliTuner £165.00
SG-231 SGC Smartuner £275.00
MFJ-924 MFJ UHF ATU £85.00
MFJ-994 Automatic ATU 1.8-30MHz £255.00
Capco SPC-100300W ATU £95.00
MFJ-986 MFJ 3kW ATU, ANTENNA TUNER. £279.00
MK-II Multi-tuner £48.95
Drake MN-2000Antenna Tuner £240.00

Books
Icom IC-R20manual in Italian £5.00
AERAD Chart 1994 £2.00
Air Band Radio Handbook 8th Edition £5.00
Air Band Radio Guide 6th Edition £5.00
Airwaves 2007 £8.00
ARRL Handbook 1983 £10.00
ARRL Handbook 1984 £10.00
ARRL Handbook 1985£10.00
ARRL Handbook 1986 £10.00
ARRL Handbook 1987 £10.00
Usborne Audio and Radio Book £5.00
BBC Radio Transmitting Stations 1993-94 £5.00
BBC Radio Transmitting Stations Spring 1990£5.00
Beginners Guide To Packet Radio £5.00
Ferrell's Confidential Frequency List £8.00
Flight Routings 2001 £5.00
Flight Routings 1992 £5.00
International Airband Radio Handbook £5.00
International FM Guide £2.00
Intermediate Licence Book £4.00
IBA Guide to TV and Radio 1990£2.00
Microcomputers in Amateur Radio £5.00
PM3055-57 Oscilloscope Manual £5.00
Packet Radio Primer £5.00
Radio Amateur Operator's Handbook £5.00
"Radio" by Tucker & Wilkinson Vol-2 £5.00
"Radio" by Tucker & Wilkinson Vol-3 £5.00
Radio Servicing Vol-4 £5.00
Radio Amateurs' Examination Manual £5.00
RAE Revision Notes £5.00
R&EW Amateurs Handbook Vol 1, 2 & 3 £4.00
RSGB IOTA Directory 2000£5.00
Scanners 2 International £5.00
UK Scanning Directory 4th Edition £5.00
UK Scanning Directory 2nd Edition £5.00
"Calling Shanwick" £5.00
Shortwave Voices of the World £5.00
"49 The Thyristor Book" £5.00
Transistor Equivalents and Substitutes £5.00
UK Scanning Directory 6th Edition £5.00
UK Scanning Directory 8th Edition £5.00
USA Radio Amateur Callbook 1986 £5.00
VHF Communications Magazine 1975£5.00
Wireless Servicing Manual £5.00
WRTV Handbook 36th Edition £5.00
WRTV Handbook 1987 Edition £5.00
WRTV Handbook 40th Anniversary Edition £5.00
WRTV Handbook 27th Edition £5.00
RSGB Amateur Radio Operating Manual £5.00
Electronic Service Manual £20.00
Scanners 4 Book £5.00

CB
Lodestar SWR-2T SWR Meter £15.00
Emperor Ninja CB £69.00
Lodestar SWR-2S SWR Meter £15.00
CB SWR Meter £15.00
Ranger RCI 2950DX 10- 12m Transceiver £189.00
Ranger RCI 2970DX 10- 12m " 150w" Transceiver £249.95
Maycom EM-27 CB Transceiver £55.00
DX-5000 K-PO - AM/FM/SSB 10/11 Meter Mobile Amateur £189.00
CB Mag mount Antenna £10.00
Harrier-CBX CB Radio £69.00

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

Data Comms
Kamtronics KAM Multimode TNC £129.00
ERA Microreader CW Decoder £79.00
USB 56K MODEM £10.00
MFJ-1278b DSP Multimode Data Controller £249.00

DC/Cig adapter/chargers
NC-386 Ni-Cd Battery Charger £20.00

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

Filters (various)
Bremi BRL-10- TVI Low Pass filter 27MHz £10.00
AEC LP-30- Low Pass Filter £15.00
Packer TVI Filter £9.95
Vanco HF Low Pass Filter £14.95
YK-88C-1 CW 500Hz Filter £59.00
2m Helical Band Pass Filter £60.00
FL-132 CW Narrow Filter for Main Band £75.00
FL-133 CW Narrow Filter for Sub Band £70.00
Frequency Counter/finder
Watson Hunter 10MHz-3GHz £55.00
Maplin MF100 Multifunction Counter £59.00

Handheld transceivers
Yaesu VX-2E Dual Band Handy £99.00
Icom IC-E92D transceiver £295.00
Alinco DJ-V17E 2m Handheld £104.95
FDC-450A 70cm Handheld £79.00
FDC-150A 2m Handheld £79.00
Quansheng 70cm Handheld £79.00
Quansheng 2m Handheld £69.00
FDC Battery £15.00
Kenwood TH-G71E Dualband Handheld £149.00
Wouxun KT-689 2m Transceiver £59.00
CSC-90Soft Case for VX-2E £10.00
FT-708R 70cm Hand Held Transceiver £49.95
FNB-82LI (Spare) 1000mA Lithium-ion Battery pack for £18.00
CSC-72 Leatherette Case for VR-500/ VT-120£10.00
Alinco DJ-S41 UHF Handheld £58.75
Jingtong JT-208 2m Handheld £49.00
Jingtong JT-308 70cm Handheld £49.00
EDC-144 Rapid Charge Cradle £29.00
Yaesu FNB-102LI 7.4V 1800mAh battery £40.00
ADMS-VX8 Programming software and lead for VX-8 £45.00
Yaesu CSC-93 soft case £9.00
BT-13 Dry Cell case for TH-F7E £13.00
Puxing PX-777 UHF Handheld £49.00
KST V6 UHF Handheld £30.00

HF Transceivers
TS-480HX £669.00
Yaesu FT-1000MK V 200w £1,499.00
Kenwood TS-950SD HF Transceiver £1,099.00
Kenwood TS-570DG/E HF transceiver £629.00
Yaesu FT-890AT HF Transceiver £425.00
Alinco DX-70TH HF & 6m transceiver £399.00
Yaesu FT-990/AC £799.00
Icom IC-706 MkIIG with DSP £629.00
IC-756PRO-MKIII Icom HF + 6m Trx £1,699.00
Yaesu FT-2000100W with internal power supp £1,599.00
Yaesu FT-2000D 200watts £1,950.00
IC-7400 HF, 6m & 2m transceiver £849.00
Icom IC-718 HF Transceiver £459.00
Icom IC-7700- TRANSCEIVER £4,295.00
Yaesu FT-950 £989.00
Yaesu FT-690R II £275.00
IC-7200HF Transceiver £649.00
IC-706 MK2 £499.00
Alinco DX-SR8 HF transceiver HF, 100W all mode £529.00
ICOM MB-117 - Carrying Handle for IC-7200 £10.00
ICOM MB-116 - Handles for IC-7200 £45.00

Mics and Speakers
SMC-34 Speaker/Microphone with Volume Control £21.63
HM-133 Remote Control Microphone for IC-E208 £52.46
MC-90Desk Mic for DSP £149.00
Alinco EMS-8 - Speaker Microphone £10.00
SMC-33 Speaker/Microphone with 3 Function Buttons £15.00
EMS-47 Remote Control Hand Speaker/mic £15.00
Yaesu MH-32 Speaker-Mic £15.00
MFJ-295 £12.95
HM-10-4 Heil Hand mic. with HC-4 insert £60.00
Eagle A069 Earpiece £5.00
YM-24A Speaker Microphone £25.00
Yaesu MH-12A2B speaker-microphone £15.00
EDS-10Microphone adaptor cable £5.95
QS-112Y4S Watson Handheld Speaker Mic £10.00
Sharman's DM-300Speaker Mic (Kenwood) £12.00
HM-131L GS Style Speaker/mic for IC-T3H £20.00
Icom HM-70Speaker Microphone £20.00
Speaker Mic for Kenwood £10.00
Speaker Mic (Yaesu VX-1 etc.) £9.00
Speaker Mic (Icom Two Pin) £9.00
Sharman's Speaker Mic (Icom Two Pin) £9.00

Morse keys / tutors
NATO Morse Key £199.00
Ex-Army Key with Operators Unit £39.00
Kent Twin Paddle Morse Key £79.95
Star-Masterkey CW Keyer £49.95
MFJ-451X Morse Interface (no keyboard) £85.00
Kent Keyer £79.00
"Kent-Two" Combined Morse Keys £100.00

Power supplies
Bnos 20AMP PSU £99.00
Kenwood PS-430Power Supply £119.00
PT-1012 Microset 12A 13.5PSU £109.96
Self PS-134,DC power supply £20.00
Farnell G-12 £59.00
B.N.O.S 12amp power supply £59.00
Drae 6-Amp PSU £49.00
Yaesu FP-8 PSU £69.00
Apollo CB-35PSU £20.00
Altai RPS-1203 £20.00
Mini Power Supply £14.95
Drae 24 Amp PSU £99.00
GZV-4000Diamond 40A Switch Mode £165.00
Mercury 20Amp Output, 13.8 Volts PSU £50.00

Receivers
Icom IC-R72 Receiver £399.00
AOR AR-7030£550.00
Realistic DX-394 HF Receiver £129.00
Yaesu FRG-100HF Receiver £299.00
Icom IC-R8500Receiver £1,099.00
AOR AR-7030+ HF Receiver £699.00
AOR AR-3000Wide Band Receiver £350.00
Kenwood R-5000Communications Receiver HF £599.00
R-30CC HF PALSTAR HF Rx £499.00
Kenwood VC-20VHF Converter FOR R-5000£175.00
Alinco DJ-X30Scanning Receiver 100KHz - 1.3GHz £125.00
VR-120Yaesu receiver £89.00
ABM-1-KIT Ramsey Passive Airband Monitor Kit £60.00
IC-EX257 FM Board for IC-R71 £69.00
Palstar R-30A Short Wave Receiver £499.00
Icom IC-R8500Receiver £899.00

Scanners
AR-8200-MkIII AOR Scanner 530kHz-3 GHz £359.00
Icom IC-R3 Hand held Scanner £250.00
Realistic Pro-2042 Base Scanner £150.00
GRE PSR-214 FM Base Scanner £89.00
UBC-92 XLT Uniden-Bearcat Handheld Scanner £85.00
Yaesu VR-500100kHz-1300MHz Scanner £169.00
UBC-72XLT Scanner with 'Close Call' £74.95
AOR 8200Mk1 £220.00
UBC-785XLT Uniden-Bearcat Base Scanner £209.00
IC-RX7 - Wideband Handheld Receiver £179.00
PSR-255GRE Handheld Scanner £50.00
Realistic Pro-9200Scanner £59.00
UBC-278CLT Uniden-Bearcat Base Scanner £60.00
Realistic Pro-2021 Base or Mobile Scanner £59.00
TTI TSC-3000R H/HELD SCANNER £89.95

Scopes
kenwood SM-220Scope £249.00

VHF/UHF Transceivers
Icom IC-271E 2m multi mode £299.00
Icom IC-490E 70cms Mobile £250.00
Kenwood TS-2000All Band Base £949.00
Kenwood TS-271E £165.00
Kenwood TS-790E 2/70Base £750.00
FT-290RMKI 2m Multi mode £150.00
Yaesu FT-790 £159.00
Yaesu FT-1500M £129.00
Trio (Kenwood) TS-711E 2m Multi-mode £375.00
Yaesu FT-817 Portable Transceiver £379.00
IC-7400 HF, 6m & 2m transceiver £849.00
Icom IC-821H Dual Band transceiver £599.00
Yaesu FT-290MkII 2m Multi-mode transceiver £250.00
Kenwood TS-2000 HF, 6/2/70 Transceiver £1,199.00
Yaesu FT-857d Mobile Transceiver £475.00
Yaesu FT-736R 6m, 2m & 70cm Base £799.00
Yaesu FT-7100M Dual Band Mobile Transceiver £220.00
Yaesu FT-480R 2m SSB, CW & FM Transceiver £220.00
Yaesu FTV-901R 2m / 70cm Transverter £275.00
Kenwood TS-2000All Mode Multibander Transceiver £999.00
ICOM IC-2200H 144-146 £189.00
Icom IC-70001.8 - 70cms Mobile Transceiver £899.00
Yaesu FT-1802E FM 2m Band Transceiver £98.00
The TINY-2 MK-II - With Open Squelch Board £109.00
Kenwood TM-741E - VHF/UHF transceiver £229.00
DR-635E Alinco 2m/70cm FM Dual Band Mobile £239.00
Alinco DR-620remote cables £12.00
FT-1900ULTRA RUGGED 55-WATT 144 MHz MOBILE £108.95

Virtual Radars
AirNav Radarbox 2009 version £299.00

bhi

ANEM amplified module. .....£127.99.
1042 6-way switch box.....£29.99.
NEDSP-1061-KBD DSP module..£101.95.
NEDSP-1062KBD Noise Module.... £106.95.
NEIM1031 Noise Module.....£142.95.
NES10-2 MK III speaker .....£112.95.
1090 Radiomate Keypad.....£89.95.

bhi

PayPal MasterCard VISA VISA Electron SWITCH SOLO

Stock and prices accurate as of 09/08/2011. E&OE.
For accurate, up-to-date prices please check our website before visiting our shop

http://www.radioworld.co.uk

Tel 01922 414796
Fax 01922 417829
skype radioworld_uk

Signal Hound

Compact 4.4GHz spectrum analyser and matching tracking generator

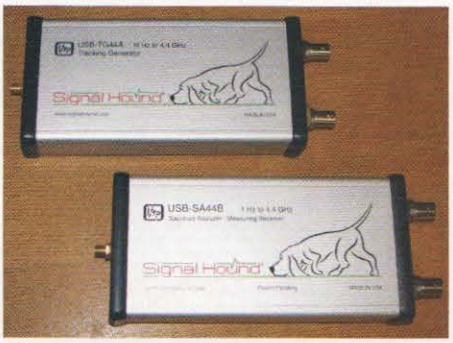


PHOTO 1: The SA44B spectrum analyser (front) and TG44 tracking generator.

INTRODUCTION. A spectrum analyser is a very desirable item of test equipment. It enables you to check the spectral cleanliness of your signal, find instability problems and can act as a selective measurement receiver and a great deal more. A new professional spectrum analyser can cost many tens of thousands of pounds. Even pre-owned spectrum analysers can be very costly. Then if something goes wrong they can be expensive to repair. But all that is changing. Several companies now offer high performance spectrum analysers, based on software defined radio (SDR) technologies, within the budget of many amateurs.

The Signal Hound SA44B costs less than many HF transceivers. It is made by the American company Test Equipment Plus (TEP) [1] and is a high performance spectrum analyser covering from near DC to 4.4GHz with a performance that should be more than adequate for most radio amateurs.

The SA44B can also be used as a measurement receiver with CW, SSB, AM and FM demodulation capability across the entire 4.4GHz frequency range. The claimed amplitude accuracy is better than ±1.5dB from 0dBm down to the displayed noise level (which depends on frequency and resolution bandwidth) and ±2dB from 0 to +10dBm. Using the internal reference the frequency accuracy is better than 1ppm (part per million).

PREREQUISITES. The Signal Hound is not a standalone item. A laptop or desk top computer with two or more USB 2.0 interfaces is required to use the Signal Hound SA44B and TG44. The Signal Hound is powered from the computer over the USB interface. The same interface is used to pass data to and from the instrument. All data processing is done in the computer; you'll need a Windows system with at least a 2GHz processor and 1GB of RAM.

The SA44B spectrum analyser and TG44 tracking generator are housed in identical extruded aluminium cases. At just 20cm long and weighing 290g they should be easily accommodated on most work benches.

BRIEF OVERVIEW OF THE ANALYSER SYSTEM. I was requested not to open up the case of the review analyser so, of necessity, this section relies heavily on the manufacturer's description of the Signal Hound hardware.

From the basic block diagram in the manual, it appears to use a conventional superhet RF front end with a digital sampling back end that converts the filtered intermediate frequency signal to an I/Q (in-phase and quadrature) bit stream. The bit stream passes over the USB connection to the host computer for signal processing and display on the computer screen. Few details of the signal processing are given in the manual.

The spectrum to be displayed enters the SA44B through an SMA socket on the front panel and then to an attenuator with three selectable steps, from 0 to 15dB. The attenuator is directly connected to the input in order to retain response down to DC. This could make the attenuator vulnerable to damage if any DC appears at the input. For this reason an external DC block, with good frequency response to at least 4.4GHz, should be used whenever the low frequency response is not needed. The DC block is not supplied with the SA44B, but is available as an accessory.

The attenuator is followed by a wideband preamplifier that can be switched into the signal path when extra sensitivity is required. The preamplifier cannot be used below 500kHz.

After the preamplifier the input spectrum passes to one of two mixers. In its simplest operating mode, the local oscillator that feeds the two mixers is stepped, under software control, over the required frequency range in 200kHz steps (or less) in order to produce a series of bands at 200kHz intervals. These are filtered to 250kHz wide individual bands by the 10.7MHz IF filter. This arrangement produces a whole series of responses from the input spectrum. At least one of the responses will be the band of image frequencies from the input spectrum. The software is left to process this complex spectrum to identify and remove not only the image frequencies but also any other internally generated spurious signals. It does this extremely effectively.

A disadvantage of this technique is that covering a span of 4.4GHz in 200kHz steps can take over 30 seconds. Narrower spans take considerably less time. A 5MHz bandwidth filter is used during wide frequency sweeps. Narrow bandwidth filtering down to as low as 0.1Hz takes place in the host computer using FFT (fast Fourier transforms).

For anyone familiar with conventional spectrum analysers the Signal Hound SA44B may require a period of adjustment. It took me about an hour of playing with the SA44B to familiarise myself with it enough to start to get the best out of it. It can be time-consuming to use the SA44B to adjust circuits as the screen display is not in real time. There can be a noticeable delay between making adjustments and seeing the result on the screen. In these circumstances it is best to make circuit adjustments using narrow spans and then to open out the span to see the results at higher or lower frequencies.

An external 10MHz reference input, via a BNC socket on the rear of the SA44B, can improve the frequency accuracy of the instrument as well as its phase noise performance. A second BNC connector on the rear of the SA44B provides a trigger input/output connection. This is useful for synchronising sweeps to some external event. It will accept both 3.3V and 5V (TTL) levels. The TG44 tracking generator sweep is triggered from this same connection.

Located centrally on the rear panel is a type B USB 2.0 connector to allow the

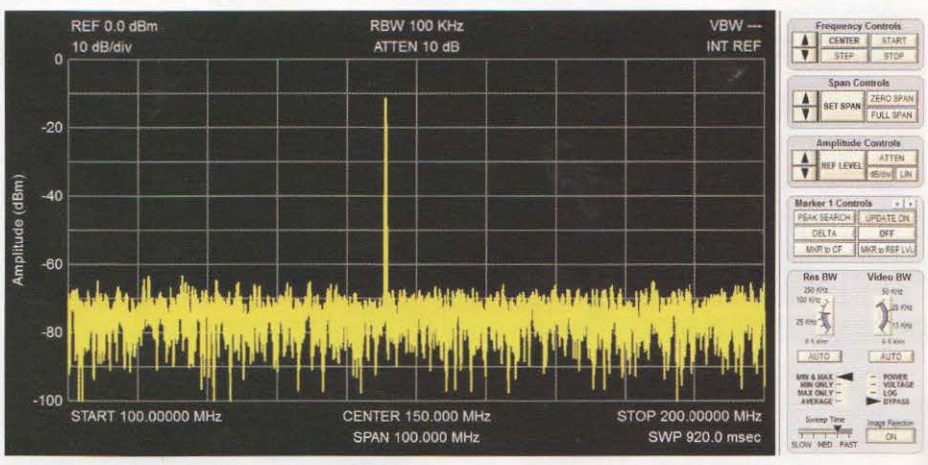


FIGURE 1: 144MHz output from Kenwood TH-6F.

supplied USB lead to connect the Signal Hound to the host computer. A bi-colour LED on the front panel shows green when the Signal Hound is powered and flashes amber when it is receiving data from the host computer.

GRAPHICAL USER INTERFACE (GUI) DISPLAY. A software defined radio relies heavily on the quality of the controlling application software. I'm pleased to say that the Signal Hound GUI seems to have been well thought out, is easy to use and works well. The version current at the time of this review was 2.07. This version provides support for the tracking generator as well as a number of useful utilities such as harmonic measurement, channel power and phase noise. These are in addition to the usual spectrum analyser facilities of carrier level and spectral response.

Figure 1 shows the captured output spectrum from my Kenwood TH7 handheld (suitably attenuated) when transmitting an unmodulated carrier on the 144MHz band. The GUI provides a large screen area for the spectrum display in a 10 by 10 matrix. The usual spectrum analyser control 'buttons' are located down the right side of the screen. The 145.500MHz signal is the vertical line near the middle of the frequency scale.

Frequency, Span and Amplitude buttons control the main functions of the analyser. In this case the top of the screen has been set to a 0dBm (1mW/50Ω) reference level. The vertical screen display is set at 10dB/division and the horizontal screen is set to show from 100MHz on the left to 200MHz on the right. Sweep time is 920msec. The displayed average noise level (DANL) is approximately -75dBm with the 144MHz carrier at -12dBm. No markers have been selected; the resolution bandwidth (set automatically by the computer) is 50kHz.

Image reject is switched on. When switched off there are several spurious responses in addition to the main image 21.4MHz below the wanted display signal. This indicates over 70dB of spurious display rejection at this frequency. The same or better performance is seen with a carrier at 433MHz.

Of course an analyser needs to be able to 'zoom' right into a signal in order to be able to analyse modulation. In order to obtain a clear and unambiguous display this means using a resolution bandwidth filter that is much less than that of the occupied bandwidth of the modulated signal. **Figure 2** shows a 433.5MHz narrow band FM signal. This is a screen capture showing the output from my Kenwood TH7 handheld, modulated by a single tone. The resolution bandwidth of 200Hz clearly shows the individual sidebands of the FM signal.

Along the top of the display in Figure 2 you can see a row of buttons including one marked 'Utilities'. When you click on this a drop-down menu allows access to a number of useful functions. The first of these is 'Audio listen'. This opens a small window from which you can select frequency, IF bandwidth, mode and de-emphasis. It is first necessary to display the signal you want to listen to by placing the marker on that signal. Now you can apply the selected demodulation parameters. The computer speaker allows you to listen to the selected signal. A little lower down the utilities menu you will see 'Measuring Receiver'. This opens a window showing the frequency and modulation characteristics of the selected signal. Many other utilities are included but space precludes reporting on them all.

Parameter	Manufacturer's claim	Measured	Comments
Frequency range	1Hz to 4.4GHz	<10kHz to 4.4GHz	
Marker frequency accuracy	±1ppm	0.25ppm*	Internal TCXO at 21°C. * Measured with 100kHz span at 2.4GHz.
Marker amplitude accuracy			
100MHz			
0dBm		-0.6dB	
-30dBm		-0.4dB	
-60dBm		-0.5dB	
1GHz			
0dBm		-0.35dB	
-30dBm		-0.3dB	
-60dBm		-1.0dB	
2.4GHz			
0dBm		-0.1dB	
-30dBm		-0.5dB	
-60dBm		-1.5dB	
1dB gain compression			
100MHz	+16dBm typical	+18dBm	15dB attenuation, preamp off.
1GHz	+19dBm typical	+20dBm	
Displayed average noise level (DANL)			*Marker offset to avoid low level spurious output at 100MHz and 1GHz.*
100MHz, preamp off	-148dBm	-158dBm	Normalised to 1Hz
100MHz, preamp on	-161dBm	-170dBm	from measurement at
1GHz, preamp off	-144dBm	-152dBm	100Hz resolution bandwidth.
1GHz, preamp on	-158dBm	-165dBm	
Residual spurious at the input connector		*Att. 15dB, preamp on*	*Att. 0dB, preamp off*
1Hz to 500kHz	-70dBm	Not measured	Not measured
500kHz to 1GHz	-57dBm	-57dBm	-20dBm
1GHz to 2.3GHz	-47dBm	-55dBm	-20dBm
2.3GHz to 2.6GHz	-40dBm	-55dBm	-28dBm
2.6GHz to 3.0GHz	-27dBm	-60dBm	-27dBm
3.0GHz to 4.4GHz	-35dBm	-48dBm	-27dBm

PHOTO 2: Front of SA44B analyser. The front of the TG44 tracking generator is similar.

PHOTO 3: SA44B rear panel. The TG44 is similar.

MEASURING SPECTRUM ANALYSER PARAMETERS. Since a spectrum analyser is likely to be relied upon for a number of amateur radio related measurements, some idea of its accuracy was required. I felt it was worth checking a number of the manufacturer's claims against professional test equipment that originally had cost many times the price of the Signal Hound. In Table 1 the first column identifies parameters, column 2 shows the manufacturer's specification and column three contains my measurements. The fourth column has my comments. Although my equipment is not formally calibrated, it is regularly compared with calibrated equipment. Even so, some discrepancies may be noticed, which may be due to differences in measurement technique or interpretation of specifications.

TG44 TRACKING GENERATOR. The TG44 is housed in the same robust case as the SA44 and has a similar single SMA connector on the front panel for RF output, two BNC connectors on the rear panel for interconnection to the spectrum analyser and a type B USB2.0 USB connector for connection to the host computer. A BNC to BNC lead, USB cable and SMA male to male adapter are supplied with the TG44.

The TG44 can be used with the SA44B spectrum analyser to create a simple but effective scalar network analyser system that can be used to measure RF gain, frequency response, gain compression and insertion loss. Used with a suitable directional coupler or bridge, it can also be used to measure return loss. The reviewed software does not allow for normalisation in this mode, but this may be added in a future release.

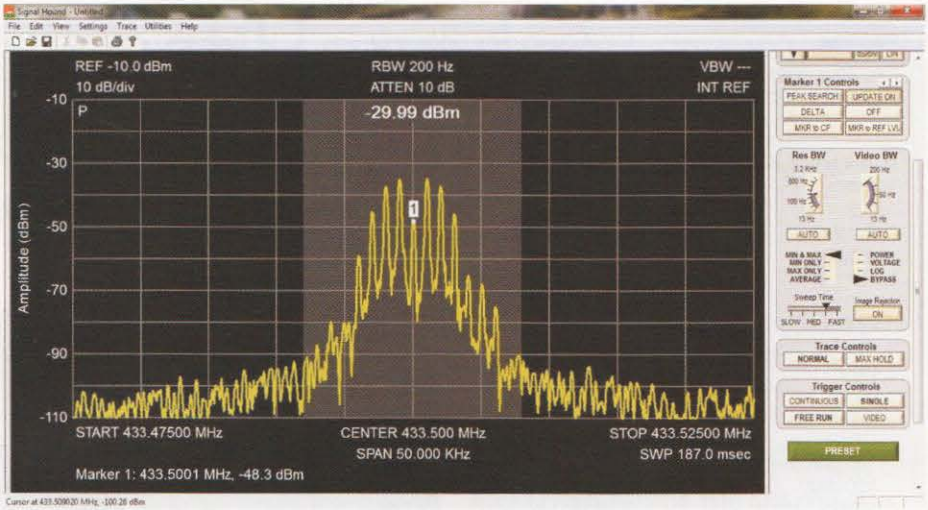


FIGURE 2: 433MHz FM modulated output from the Kenwood TH-6F.

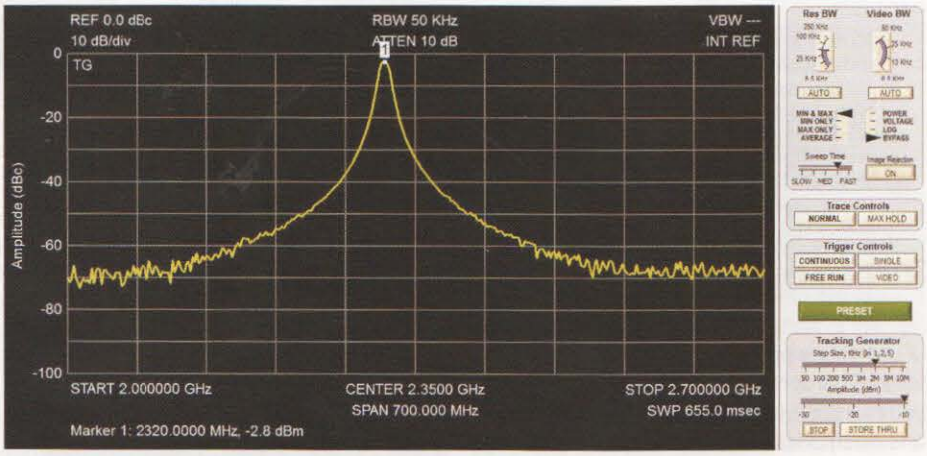


FIGURE 3: 2.3GHz filter response plotted with the help of the TG44 tracking generator.

In addition to use as a tracking generator, the TG44 can also be used as a CW (unmodulated) signal generator with output from 10Hz to 4.4GHz. This is an enormous frequency range and makes the TG44 worth having in the shack for this purpose alone. Note that the harmonic output of the generator is quite high, which may make it unsuitable for some measurements. An external low pass filter or two could easily solve the harmonic problem for many applications.

IN USE. The TG44 was used in conjunction with the SA44B to measure the response of a two pole interdigital filter tuned to 2.320MHz. This filter forms part of my 2.3GHz band system.

Control of the TG44 is from the spectrum analyser GUI. The controls for sweep and level are located at the lower right hand side of the GUI screen. In order to perform a sweep of a filter, such as shown in **Figure 3**, the sweep frequency limits should be set as appropriate. For a filter the RF level should not be important, so use the maximum available from the TG44 in order to achieve the largest on-screen dynamic range.

First, connect the tracking generator directly to the spectrum analyser using the RF cable and connector adapters you will be using to connect to the filter.

There should be a flat, straight line on the display. However, it will probably be some way below the top-of-screen reference line. Click the 'STORE THRU' button on the GUI screen. The through loss will now be subtracted and the display will move to the top of the screen. Connect the filter or other device under test (DUT) between the test leads. The frequency response of the DUT will appear on screen. Click the marker peak search and the on-screen marker will appear at the peak of the DUT response. If it is a filter then the filter insertion loss will be shown at the bottom of the screen. Using marker delta or two markers, the filter bandwidth or filter out-of-band response can be measured. Wide sweep widths require the TG44 10MHz output to be connected to the SA44B 10MHz reference input.

CONCLUSIONS. My measurements on the spectrum analyser revealed surprisingly good results. Amplitude accuracy was particularly good and certainly more than adequate for the majority of amateur radio purposes.

Frequency accuracy, even using the internal TCXO, was much better than expected, but could be improved upon further by using a suitable external 10MHz reference, preferably one with low phase noise. This makes the SA44B very useful as a selective frequency measuring device, particularly when several signals are present or waveforms are very distorted. A frequency counter alone can easily be fooled into measuring and indicating the wrong frequency under these conditions.

The discrepancies in the DANL measurements in the measurements table may be due to differences in where the visually averaged noise waveform was taken to lie.

I wonder if TEP might not have updated their manual from a previous version of the SA44 since the spurious outputs at the input connector seemed unduly pessimistic. I added a fourth data column to the table entry to show that without the attenuator set to 15dB and the preamp switched out, the spurious levels were closer to those in the SA44B manual. The measured figures are very good for this type of receiver where there is no RF band-pass filter to help with LO rejection.

I mentioned near the beginning of this review that it might take a little getting used to compared to a conventional spectrum analyser. The reason for this is that wide band sweeps can take many seconds to complete. In some situations this can make this type of analyser difficult to use for adjustment purposes, since you might have to wait a long time to see the results of each adjustment made. For narrow sweeps this should not be a problem.

The TG44 tracking generator proved extremely useful but the GUI display froze a few times when making adjustments to the swept frequency range. This necessitated re-booting the software. However, an updated TG44 was due for imminent release and this should eliminate these (firmware related?) problems.

I would have liked to have seen a facility for saving screen shots. Printing is already taken care of, but if you want to save a screen shot, such as the display of the TH-6F FM modulation, it is necessary to use CNTL Prt SC and then import the bit map into a suitable editing program. If there is a facility to do this already, I didn't find it!

For the tests I used a Sony Vaio laptop with Intel CORE i3 processor with 2.3GHz clock and 6GB RAM running on Windows 7 Professional.

Overall, I was very pleased with the performance of the SA44B. If I didn't already possess a good spectrum analyser I could be very tempted to buy one of these. The TG44 is perfectly useable and has excellent frequency coverage.

My thanks to Test Equipment Plus for the loan of the review samples. The Signal Hound SA44B spectrum analyser costs €799 + 19% VAT and the TG44A tracking generator is €520 + 19% VAT. The European distributor is Dutch company Foltronics, see www.SignalHound.eu.

WEBSEARCH

[1] Test Equipment Plus – www.signalhound.com

Yaesu FT-950 Transceiver

Direct lineage from the legendary FT DX 9000 and FT-2000

HF/50 MHz 100 W Transceiver
FT-950

- Triple-conversion super-heterodyne receiver architecture, using 69.450 MHz 1st IF
- Eight narrow, band-pass filters in the RF stage eliminate out of band interference and protect the powerful 1st IF
- 1st IF 3 kHz Roofing filter included
- High-speed Direct Digital Synthesizer (DDS) and high-spec Digital PLL for outstanding Local Oscillator performance
- Original YAESU IF DSP advanced design, provides comfortable and effective reception. IF SHIFT / IF WIDTH / CONTOUR / NOTCH / DNR
- DSP enhancement of Transmit SSB/AM signal quality with Parametric Microphone Equalizer and Speech Processor
- Built-in high stability TCXO (0.5 ppm at room temperature)
- Built-in automatic antenna tuner ATU, with 100 memories
- Powerful CW operating capabilities for CW enthusiasts including CW Zero-in and CW Spot features
- Five Voice Message memories, with the optional DVS-6 unit
- Large Multi-colour VFD (Vacuum Fluorescent Display)
- Optional Data Management Unit (DMU-2000) permits display of various operating conditions, transceiver status and station logging.
- Optional RF μ-Tune Ultra Sharp Preselector System for 160 m, 80/40 m and 30/20 m Bands

Optional, YAESU Exclusive, Fully-Automatic -Tuning Preselector System!

Fully automatic, Ultra-sharp, External μ-Tuning Preselector (optional) features a 1.1" (28 mm) Coil for High Q

On the lower Amateur bands, strong signal voltages can impinge on a receiver and create noise and intermod that can cover up the weak signals you're trying to pull through. YAESU engineers developed the μ (Mu) Tuning system for the FT DX 9000/FT-2000, which is now available as an option for the FT-950. There are three modules available, the MTU-160, MTU-80/40, and MTU-30/20); these may be connected externally, using the optional base kit, with no internal modification required.

When the μ-Tuning module is engaged, the VRF system is bypassed, but the fixed Bandpass Filters are still in the received signal path.

Optional External Data Management Unit (DMU-2000) Provides Many Display Capabilities

Enjoy the ultimate in operating ease by adding the DMU-2000!

Enjoy the same displays that are available with the FT DX 9000 and FT-2000: Band Scope, Audio Scope, X-Y Oscilloscope, World Clock, Rotator Control, Extensive Transceiver Status Displays, and Station Logging Capability. These extensive functions are displayed on your user-supplied computer monitor.

Shown with after-market keyer paddle, keyboard, and monitor (not supplied).

DMU-2000
Data Management Unit (option)

For the latest Yaesu news, visit us on the Internet:
http://www.yaesu.co.uk

Specifications subject to change without notice. Some accessories and/or options may be standard in some areas. Frequency coverage may differ in some countries. Check with your local Yaesu dealer for specific details.

YAESU
Choice of the World's top DX'ers

Design Notes

SDR QRP plus a battery protection module

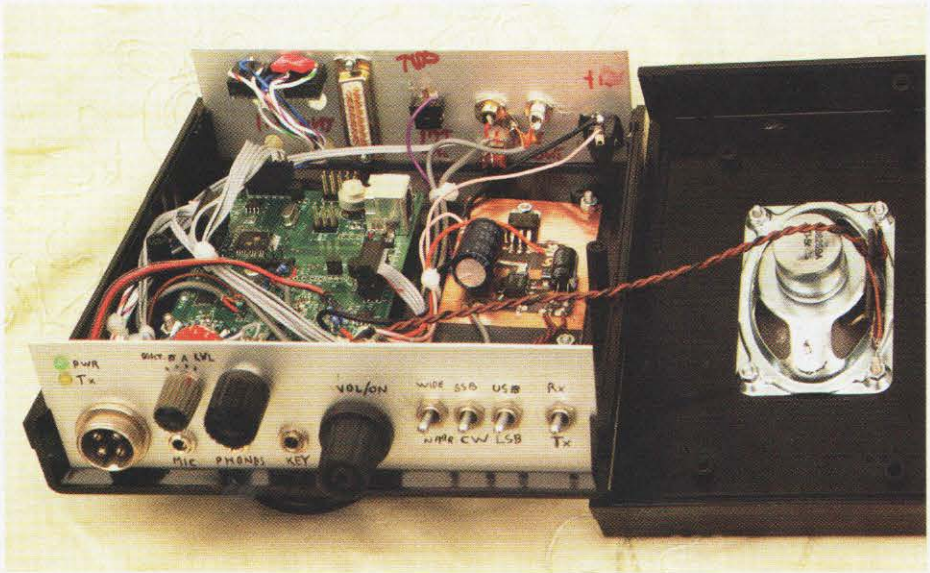


PHOTO 1: The stripped-down SDR2GO module (left side) installed in a box with peripheral circuits and front panel switches for controlling operations.

SDR2GO. The Austin QRP club is an active group with aims similar to the G QRP club. Homebrew and construction is high up their list of priorities, especially of receivers and transceivers. Several kits are available for constructors via their members [1]. One such kit is the SDR2GO. Its main purpose is to provide a back end for the SoftRock range of SDR radios and companion transmitter kits that use a quadrature sampling detector for I/Q mixer and a Si570 chip as the local oscillator. In its original form, the SDR2GO fulfils two completely separate tasks when used in conjunction with the SoftRock. A rotary encoder and LCD allow the centre frequency of the synthesiser to be set and tuned, just as if it were a stand-alone receiver or transceiver. But, uniquely, it also has a DSP-based audio processor to interface the baseband I/Q Tx and Rx audio streams to microphone and headphones respectively, with filtering and AGC on receive. A second rotary encoder is used for level control and I/Q balance. A laptop or PC is no longer required for a complete standalone SDR transceiver for low power portable operation using SSB and CW: just the SoftRock RF front end and SDR2GO back end.

I have for some time been toying with using the direct upconversion / downconversion route for the V/UHF to microwave bands, so when I saw the SDR2GO details just had to try it out. The kit was only $80 (about £50) and it arrived in a couple of weeks. I had no interest in the Si570 synthesiser control, so much of the design was not needed. In particular, the LCD module and one of the rotary encoder was superfluous. However, it would probably not have been possible to even source the components I did need in the UK, at that price, as well as having to program both the processors myself (the kit comes with them pre-programmed) and making a PCB. So, wasting a fair bit of the kit's capability and parts was still cost-effective.

Assembling the kit was straightforward, with a fully annotated PCB and components list – although it is aimed at those experienced in SMD construction. There are several ICs with sub-millimetre pin spacing, including one chip with edge mounting TQFP construction. In spite of looking difficult to solder (it was my first experience with this sort of package), this actually proved easier to mount than the more conventional gull-wing pads. Additional flux and a 'wipe' with a soldering iron along each side did the job perfectly! Apart from the LCD and one rotary encoder I did not bother trying to identify exactly which components were applicable to the DSP and which to the Si570 control; it was easier to just install all of them. Most of the components are common anyway. The unit worked first time, taking in I/Q signals from my 144MHz direct conversion receiver [2] and correctly demodulating and filtering SSB and CW audio. The latest version of the SDR2GO firmware includes a 500Hz wide CW filter on receive as well as a CW side tone on transmit. The Tx side was tested with my LF upconverter and, after setting up the phase and amplitude trimming, could manage 60dB sideband rejection.

Photo 1 shows the SDR2GO module, minus the not-used LCD and rotary encoder that would otherwise control the Si570 synthesiser, installed in a box. There's also a loudspeaker and LM386 amplifier, 5V regulator, control switches and input / output connectors. When connected to a suitable quadrature up/downconverter and local oscillator, a complete SSB / CW transceiver is the result.

TRANSCEIVER ON A CHIP. Chris, GW6KZZ comments on a chip he found: "here is possibly the most innovative system-on-a-chip (SoC) IC component invented this year. Freescale is in the process of finalising their MC13260 SoC two-way radio system. It integrates a software defined modem, audio converters and a fast ARM 9 processor on a single chip. It covers 60 to 960MHz (with an optional external LNA to take it up to 3GHz). The latter might encourage lots of people to use S Band satellites and it might even fit on a USB dongle. I saw these MC13260 articles, datasheet and video (listed at [3]) and thought of AMSAT and the many satellite projects due for launch 2011 and 2012, but also for those radio amateurs and experimenters that might be interested in developing their own equipment. Freescale says the MC13260 will be available in the second quarter of 2012, so we might see new handheld transceivers with built in modems and audio converters for sale by the end of 2012."

AUTOMOBILE POWER INTERFACE. Having recently changed my car, I discovered the power take off socket (which in less politically-correct days used to be called the cigar lighter socket) was wired differently. In the old vehicle, it was wired so switching off the ignition switched off power to the socket. I use this socket a lot and had a switch mode converter permanently attached. This was used to float charge a separate 12Ah lead acid battery that provided all my radio and other power supply needs when out portable. In the new vehicle the socket is permanently live and, to complicate things, there is also a second socket provided in the rear. My SMPSU float charger draws around 100mA quiescent and it would be only too easy to accidentally leave current-consuming equipment connected – potentially flattening the battery if left for extended periods. So, as I don't trust myself always to unplug accessories when leaving the vehicle, something had to be done.

I had to detect when the engine was

running and the battery charging. Without access to the engine computer interface and CAN bus codes, the easiest way was to just monitor the battery voltage itself. When it is charging, a typical car battery has a terminal voltage of 14.2 to 14.6V. When the engine is stopped, this drops to something less than 13V on a brand new unit and lower still on an older battery. Here was the solution. Monitor the voltage at the socket and use this to switch the power via a relay to my accessory battery. That would now be charged directly from the car's alternator – a better solution, in fact, than the SMPSU used previously.

Thoughts initially turned to using a PIC microcontroller with internal A/D converter, but this needs a 5V supply. This would mean a voltage regulator that would have to be powered from the vehicle's supply, with a constant drain of a few milliamps. An acceptably low drain perhaps, but not ideal. Then I remembered the TL431 three terminal shunt regulator chip used in the majority of mains-input SMPSUs. When more than 2.5V (defined by an internal reference) appears on the chip's input pin, the output goes from open-circuit to ground. The PSU output voltage is padded-down to 2.5V and the output from the TL431 used to switch the voltage controlling element. In mains-input SMPSUs this is usually done via an opto isolator to give the necessary high voltage safety barrier. Here, I could use the TL431 to switch my relay when input voltage reached 14V. The chip data sheet quoted typically 400μA quiescent current and 1μA reference input current, so the whole monitor would draw less than 0.5mA in standby – that's more like it! The switching capability of the TL431 is stated as being 100mA maximum so it could, just about, drive a relay directly, but this is not a useable solution. As soon as the relay pulls in, current would be drawn along the power connector and input cable, with a small (but significant) voltage drop. This would cause the relay to drop out, causing the voltage to rise, making the relay pull in and so on – a horrible oscillation that would go on for some time and probably damage the relay. The solution is to add hysteresis so the relay pulls in at a higher voltage than that needed for it to drop out. Hysteresis is introduced by adding positive feedback from the switched output to the reference input, so the padded-down voltage is altered as the device switches. To add positive feedback, an additional inverting buffer amplifier is needed.

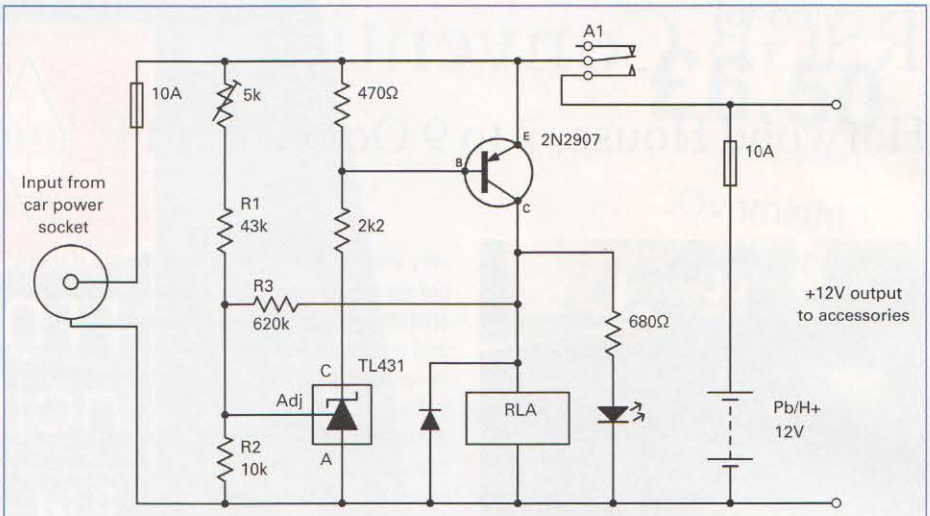


FIGURE 1: Power take off socket interface. This prevents the possibility of draining the car battery if accessories are inadvertently left plugged in.

Figure 1 shows the circuit adopted. A 2N2907 PNP transistor serves the dual purpose of relay driver and inverting voltage amplifier. R1 and R2 reduce Vin to a nominal 2.5V input to the TL431, but the actual switching threshold is modified by R3. When the relay is off (input voltage below the upper threshold), R3 is effectively in parallel with R2, increasing the input voltage needed to give 2.5V at the junction of these resistors. When the voltage rises and the modified threshold is crossed, the TL431 turns on, activating the transistor and relay and now placing R3 effectively in parallel with R1 – which reduces the input voltage now needed to turn off the chip. Just what we want.

The data sheet shows a range of 2.45 to 2.55V for the actual threshold voltage, so a preset resistor was included to allow the exact voltages for switching to be set. The value of R3 was originally calculated on the basis that 200mV of hysteresis would be adequate. It certainly wasn't! When powering a heavy load or a discharged battery, it was possible to get more than 0.7V of drop in the cable so the unwanted oscillation would start. In the end, I selected the values shown in Figure 1, giving around 900mV of hysteresis. If the auxiliary battery is partially discharged there is still the occasional bit of chattering for a second or two as the alternator voltage slowly rises when the engine is started, but this is probably acceptable. One way to stop this would be to insert a small value high power resistor, in the region of 0.03 to 0.1Ω, in series with the vehicle supply feed to the relay, to limit the instantaneous current; the additional resistance has to be after the voltage monitoring circuitry. Alternatively, the extra resistance could be in series with the battery and, here, connecting leads and even the inline fuse can be made to do the job. The unit is, of course, perfectly useable without the auxiliary lead-acid battery, just for protection against flattening the vehicle's battery. Make sure the relay is capable of comfortably carrying the peak charging or load current. A relay with 10A or higher rated contacts is ideal.

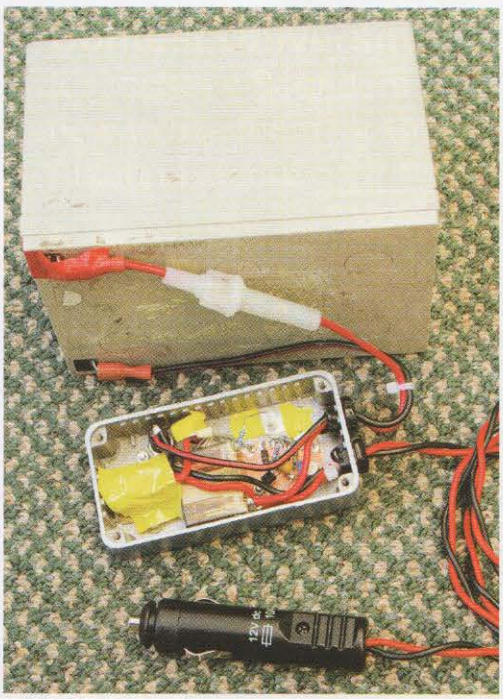


PHOTO 2: The prototype power take off device was built into a diecast box. 12V output is via sockets in the base of the box (which is the front panel when it's in use).

REFERENCES

[1] AQRP Club kits - www.qsl.net/k5bcq/Kits/Kits.html

[2] 144MHz SDR receiver - www.g4jnt.com/144MHzDCReceiver.pdf

LF Upconverter - www.g4jnt.com/LFUpconv.pdf

[3] Freescale data and information MC13260 SoC two way radio, modem, audio and processor - http://tinyurl.com/RCSEP11DN1 or www.freescale.com/webapp/sps/site/prod_summary.jsp?code=MC13260

Information on optional LNA to extend frequency range - http://tinyurl.com/RCSEP11DN2 or http://cache.freescale.com/files/rf_if/doc/prod_brief/MC13260PB.pdf

Review article on MC13260 - http://tinyurl.com/RCSEP11DN3 or www.radiolocman.com/review/article.html?di=89714

Press release on Freescale MC13260 - http://tinyurl.com/RCSEP11DN4 or http://media.freescale.com/phoenix.zhtml?c=196520&p=irol-newsArticle&ID=1537559

Freescale YouTube video on the MC13260 - www.youtube.com/watch?v=njhXZlor50s

RSGB Convention

Horwood House, 7 to 9 October 2011

Would *you* like to operate from a medium/large sized station in a contest? Visit Contest Exchange.

LECTURE PROGRAMME. The two day lecture programme is almost complete. Some 63 of a possible 65 lecture slots are filled, with a wide range of VHF/UHF, HF, microwave, technical and DXing subjects being covered. Whether you are looking to brush up your contesting ability, learn more about propagation, fancy trying digital modes or want to hear about some of the latest and best DXpeditions, there will be plenty to interest you at the Convention.

You can stay for the weekend on one of the many packages available or just come for the day – it's up to you. Day tickets are £6.50 and weekend packages start at £114.50. Many amateurs bring their partners to the event and we have a series of events for those not interested in the lectures. On Saturday we have a trip to the National Trust Stowe Landscape Gardens followed by some retail therapy and on Sunday we are planning a demonstration or a treasure hunt for partners.

To see a programme of lectures, check out the RSGB Convention website. More detail on the lectures will also appear in the October *RadCom*. Once again we will be holding hands-on sessions throughout the day where Richard, G3AAT will help you understand the workings of some basic test equipment for your shack. Whether you've never had the opportunity to try out the test equipment or would like to find out if there's more you can do, Richard will be able to help. These are informal drop-in sessions.

CONTEST EXCHANGE. Would you like to operate from a medium/large sized station to take part in a contest? Are you restricted with your home set up, perhaps by means of equipment, antennas or interference issues? Or, would you like to join a team to take part in a contest? Well, here is your opportunity!

This year, the 'Contest Exchange' offers a welcoming facility for you to meet radio amateurs that are willing to make available their stations to a guest operator. Of course, it is possible to do very well in contests with very simple stations, but sometimes it may be desired to experience operating a larger station offering towers, Yagis and amplifiers in order to be more competitive in certain contests/categories. We have built a team of willing hosts located in different regions of the United Kingdom and the Contest Exchange event is your opportunity to meet them, learn about their stations and, hopefully, provide a point of contact to agree a contest operation.

Contest Exchange will be taking place on Saturday 8 October at 2.45pm as part of the Contest University stream of events which have been sponsored by Icom UK. If you are interested, please pop along. If you have any further questions, contact Mark Haynes, M0DXR (mark.haynes@yahoo.co.uk).

CATERING. Following suggestions by visitors last year, the conference centre at Horwood House have organised some changes to the catering facilities during the day. For day visitors, Snack and Go breakfasts will be available first thing on both Saturday and Sunday. Coffee or tea, juice and filled croissants or bacon and sausage bap will be available in the Tempus lounge (cost £4.95). Then, at lunchtime, visitors can opt for the two course cooked lunch (£9) in the main restaurant or a Snack and Go lunchbox option (£6.50) in the Tempus lounge.

Friday and Saturday evenings will still be dominated by the Dinners. On Friday, the ML&S Dinner, sponsored by Martin Lynch & Sons, will also include entertainment from Alex Crow, a talented mind reader who will visit the various tables during the evening. On Saturday it is the DX Dinner, with your MC for the evening Jim Lee, G4AEH. If you would like to reserve a table (10 places) at either dinner for you and your friends, please drop an e-mail to elaine.richards@rsgb.org.uk.

G5RP TROPHY. The G5RP Trophy is an annual award to encourage newcomers to HF DXing. However, the award is not limited to youngsters or the newly-licensed: the HF DX bug can bite at any age or after many years of experience on other bands. If you are an established HF DXer and want to recommend someone to be awarded the G5RP Trophy for 2011, now is the time to send in your nomination. Your nominee should be an up-and-coming HF DXer who has made rapid progress in the last year and has some real achievements to show, for example, a good total of new countries worked or some serious HF DXpedition activity. This prestigious award will be presented at the RSGB Convention. Please send your nominations to Ian Greenshields, G4FSU, QTHR, or by e-mail to ian.greenshields@gmail.com to arrive no later than Friday 23 September.

MORSE ASSESSMENT. This year, Morse assessments will be available at the convention. Regional Manager Alison, G8ROG, will be on hand to assess any visitors wishing to take mark in a Morse assessment. All the necessary equipment will be provided and these can be booked on the day, although it will help with the planning if you could register your interest beforehand.

UK LICENCE EXAMINATIONS. The RSGB is offering those wishing to obtain a UK Amateur Radio Licence the opportunity to complete one, or more, of the required Radio Communication Examinations over the weekend of the RSGB Convention. Candidates must book their exams prior to the event and must provide evidence they have completed the required practical assessments. The contact for further information and for booking exams is the RCE Department at RSGB HQ on 01234 832700. Candidates for the Foundation or Intermediate exams must contact Brian Reay, G8OSN via g8osn.rsgb@gmail.com or on 01634 376516 so that their progress on practical assessments can be verified. If required, Brian can also advise on finding a local tutor to complete practical assessments in advance of the Convention. It is essential that Foundation and Intermediate candidates have their progress verified by Brian *before* the Convention.

RAFFLE. The RSGB Convention is known for its excellent raffle on behalf of the RSGB DXpedition Fund. This year we are pleased to announce that the prizes will be an Icom IC-7410 HF/6m base station transceiver, a Kenwood TS-590S HF/6 base transceiver and a Yaesu FT-450D HF/6m transceiver. Tickets will be on sale throughout the Convention and the draw takes place at 3pm on Sunday 9 October. Our grateful thanks to Icom UK, Kenwood and Yaesu UK for their generous donation of prizes.

RSGB 2011 Convention

Formerly known as **HFC**

7th - 9th October 2011

A packed day for only **£6.50** (for a day pass)

Overnight packages also available

2011 Highlights

Full Programme Online Now!

IOTA/SOTA
- DXpedition to Arran
- IOTA Contest forum

Technical
SDR In Action
The 2012 Olympics - Operating & Opportunities

Operating/Propagation
4W6A - Timore-Liste Dxpedition 2011
10GHz & 24GHz Earth Moon Earth communications

Contest University
Ionospheric Sounders - what they are and how to use them for Contesting
Antenna Modelling for Contesting

Something New
Introduction to digital modes on the HF bands
Instant Morse

Plus enter our **DXpedition Fund Raffle**

Great Prizes to be won!
- ▶ Icom IC7410
- ▶ Kenwood TS-590S
- ▶ Yaesu FT450D
- ▶ Plus many more!

Book Today

www.rsgb.org/rsgbconvention

or Tel. 01844 263950

Martin Lynch & Sons ML&S Principal Sponsor RSGB 2011 Convention

ML&S martin lynch & sons

The World's Favourite Ham Store

20 Celebrating Years ML&S

FRIENDLY, HELPFUL ADVICE

OUR ORDER HOTLINE

0345 2300 599

FT-950
Base Transceiver
£1265.00

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

Add the MyDEL MP-925 power supply for only £1369.95 combined.

FT-DX5000 HF Base Transceiver
The very best HF DX Radio
£4699.95

FT-DX5000D: £4999.95 FT-DX5000MP: £5399.95

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

Martin Lynch & Sons Principal Sponsor RSGB 2015 Convention

T32C

Principal sponsor for the RSGB convention & T32C DXpedition

Yaesu FT-2000
The DX Choice of 3B7C
£2249.95
2000D: **£2799.95**

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

FT-857D: £729.95
FT-857D + ATAS-120A: £999.95
FT-897D with AT-897Plus Auto ATU £924.95

New Yaesu FT-450D
£849.95

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 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 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 FT-60E
Twin band handie
£179.95

Yaesu VX-6E
2/70 handie
£259.95

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-7900
with FREE YSK7800
£239.95

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

Yaesu FT-817ND
All Band All Mode Portable Transceiver
£549.95

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!

Yaesu FT-897D
High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W)
Bundle Price: £CALL
(Rig only: £776.12)

Yaesu VR-160
Miniature communications receiver
£199.95

Yaesu FTM-350AEM
Dual-Band APRS Mobile FM with Latest firmware & FREE FGPS-1 GPS Module
£459.95

QUADRA (VL-1000)
1kW HF/6m Linear Amplifier with PSU & Auto-ATU **£4499.95**

Yaesu FT-857D+ ATAS-120A Package
The Ultimate HF Mobile Installation!
FT-857D £729.95
Package £999.95

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

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

MD-200a8x
Elite Deluxe base Station Microphone **£229.95**

MD-100a8x
Base Station Microphone
£139.95

YAESU ML&S

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

Yaesu Rotators

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

G-450C Medium duty rotator - available today.

Only £339.95

G-550 Elevation rotator for satellite operation £329.95

G-5500 Heavy-Duty PC Controlled Vertical rotator for satellite and EME applications £629.95

G-650C Medium duty with higher brake torque than the G-450 ..... £379.95

G-1000DXC This new, high-performance rotator is ideal for heavy-duty applications. Its slim-line constructions is ideal for many crank-up tower installations. Rotation range: 450°, with presets. £499.95

G-2800DXC Yaesu's top-of-the-line rotator is for extra-heavy-duty antenna installations. It includes Auto Slow Start and Auto Slow Stop features to avoid sharp jolts to the antenna array and tower. The G-2800A includes a mast clamp to simplify installation. Total rotation range: 450°, with presets. £949.95

GS-065 Mast Bearing £57.14

GC-038 Lower Clamps £34.95

Rotator Cable 25m with plugs fitted £69.95

Rotator Cable 40m with plugs fitted £123.95

Rotator Connector plugs £25.95

Got a Smart Phone?
Scan here for the unique ML&S QR Code

ACCESSORIES | AMATEUR RADIO | COMMERCIAL / PMR RADIO | AVIONICS | MARINE RADIO | RECEIVERS / SCANNERS | ANTENNAS

CONTACT US
Martin Lynch & Sons Ltd.
Outline House, 73 Guildford Street,
Chertsey, Surrey KT16 9AS
Web: **www.hamradio.co.uk**
E-mail: **sales@hamradio.co.uk**

OPENING HOURS
Monday to Friday: 9.00am to 5.30pm
Saturday: 9.30am to 4.30pm
Tel: 0345 2300 599

FRIENDLY HELPFUL ADVICE
We pride ourselves on our customer service. We believe that is has been instrumental in making us the number one choice for thousands of loyal customers.

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

MasterCard DELTA VISA

FOLLOW US ON TWITTER
HamRadioUK

ML&S martin lynch & sons

The World's Favourite Ham Store

20 Celebrating Years ML&S

FRIENDLY, HELPFUL ADVICE

OUR ORDER HOTLINE

0345 2300 599

Brand New Product!

KG-UVD1P/L
4m (66-88MHz) + 2m (136-174MHz)

ML&S Price: ONLY £99.99

The world's very first Twin Band Handie with the UK's two most popular bands in one!

Look at the frequencies in this display!!!

New KV-UV920R
Low cost Dual Band, Cross-band Repeat High Performance 2/70 FM mobile Transceiver with wideband receive, remote head etc. Due late 2011.

Wouxun KG-679E/2M 2m FM Handie
Also available for 70cm!

ML&S Prices:

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

Wouxun KG-UVPD1P
2/70 Full Dual Band FM Handie
ML&S Price: £92.99

wouxun

Wouxun KG-699E/4M
4m FM Handie
ML&S Price: £79.99
POST FREE!

Full range of Wouxun accessories are available.

The New Icom IC-9100
HF through to 23cms Base Transceiver

ML&S Price: £2899.95 available ex-stock
Or Plus 4 Pack only £3875*

Options:

UX-9100 23cm Module	£623.99
UT-121 D-Star Board	£180.00
FL-430 6kHz Roofing Filter	£60.00
FL-431 3kHz Roofing Filter	£60.00

*Plus 4 Pack includes all of the above.

ICOM

Full Icom range always in stock!

CANCELLED EXPORT ORDER!

ML&S have a limited supply of brand new 2 year warranty Icom IC-718 HF Base Station transceivers at a massive saving of £260 off RRP. Stock is very limited so ORDER NOW!

BRAND NEW Icom IC-718 100W Base station
RRP £690
ML&S £429.95 !!!

Icom HF Products

IC-718	£589.95 SEE OFFER
IC-7200	£829.95
IC-7000	£1189.95
IC-7410	£1699.00
IC-7600	£3279.95
IC-7700 DEMO	£4995
IC-7800	£Call!
IC-PW1Euro	£4699.95

Icom Receivers

IC-R9500	£Call!!

Icom V/U Products

IC-V80E	£105.00
IC-T70E	£158.25
IC-E80D	£329.95
ID-E880E	£439.10
IC-E90	£239.95
IC-E90/4m	£299.95
IC-E92ED	£388.95
IC-E2820	£485.95
IC-E2820 +UT-123	£699.95
IC-910H	£1296.96
IC-910X	£1549.95

New TS-590S HF/6m Transceiver
Latest HF & 6M FULL DSP Base Transceiver from Kenwood

AVAILABLE FROM STOCK
£1369.95

Add an MC-60A DESK MIC worth £118 for only £100!

TS-2000X
Flagship HF-23cm. All Mode Base Station
This really is a total shack in a box.

Only £1699.95!

KENWOOD

Kenwood Ham Radio Dealer of the Year 2010-2011

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

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

TH-D72E
New FM dual band transceiver
£429.95

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

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

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

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

TM-V71E 50W 2/70 Mobile
£299.95

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

MC-60A Deluxe Desk Microphone
£119.95

ML-5555
10m Multimode Transceiver
Available from stock:
£149.95

MODEL

Latest all mode 12 Watt 10m Transceiver. Simple to use, entire 10m Band in one small box at a very low affordable price.

ML-5189
20W 4m Mobile
Only £139.95
Includes FREE DTMF Mic

Solid State Amplifiers from RM!

RM ITALY

BLA-1000 Flagship 1kW key down all mode HF Linear Amplifier with built in PSU. **£2799.95**

NEW BLA-350!
300Watt output key down HF Linear Amplifier with built in PSU.
Only £649.95

Palstar

The combination of affordable pricing and high quality construction and performance makes this the tuner of choice for many Hams. **Only £449.95**

Palstar AT-2KP

AT-500	600W PEP Antenna Tuner	£409.95
AT-1500DT	1500W Differential Antenna Tuner	£449.95
AT-2KP	2000W Antenna Tuner	£449.95
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	£589.95
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

G3GIQ's obituary page: http://www.mlands.co.uk/G3GIQ.shtml

G3GIQ Silent Key. Henry Lewis, G3GIQ sadly passed away Tuesday evening, July 5th 2011. Henry was one of my oldest chums having the privilege of his friendship for over 43 years. He was my best man at my wedding to Jennifer and we named our youngest son Henry, after him. "Mr Famous" will be missed by many thousands of Hams around the world who spent most of his life dedicated to Amateur Radio. If you would like to send any words please do so, direct to G3GIQ@MLandS.co.uk. Our sympathies go out to Susan, his long term friend with whom Henry left Ealing in London to start a new life together in Devon in January this year.

Software Defined Receiver

RFspace

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

£489.95

Perseus VLF-LF-HF Receiver

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

Perseus-FM+

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

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

DV-AP-Dongle The New DVAP allows you to walk away from your PC and remote control via your D-Star handie. **£219.95**

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

WiNRADiO Excalibur Pro. WR-G33DDC

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

WiNRADiO

WiNRADiO WR-G31DDC EXCALIBUR

£699.95

For full details see web.

MFJ Products

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

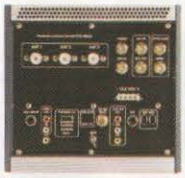
Lots more MFJ stocked! See web for details

Flex 1500
SDR Low cost SDR Transceiver.
£579.95

Flex 3000
With ATU 100 Watt SDR 160-6m with Auto ATU fitted. **£1299.95**

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

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



FlexRadio Systems

Flex 5000A-ATU
As 5000A but built-in Auto ATU. **£2745.95**

Flex 5000A-ATU+Twin RX
with second receiver
£3434.95

AirNav Systems

The Most Trusted Name In Flight Tracking

The New RadarBox is now available from ML&S!

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

Special Offer
Buy a new RadarBox 3D and add a BlackBox AirBand Receiver mk11 (RRP £79.99) for only £25!

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

See web site for full specifications

MyDEL

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

MyDEL MP-8230
13.8V DC, 25A power supply, switch mode.
£69.95

MyDEL MP-925
Linear PSU
£99.95

Ideal for FT-817ND or most handhelds.

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

Two-year warranty on all MyDEL PSUs

MyDEL PS-30SW11
Latest high performance switch mode PSU. 25amp.
£84.95

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

Ideal for TS-480HX or other 200W output radio.

MyDEL MP-9600
60A switch mode power supply.
£199.95

Alinco DM-330MW

30 AMP switch mode power supply. Lght weight and low noise.
£99.95

Yaesu FP-1030A

2 year Warranty

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

HF Linear Amplifiers

NEW Pioneer 1KW HF amplifier	£1595.00
Yaesu VL-1000 Quadra	£4499.95
Icom IC-PW1Euro	£4145.95
Ameritron ALH-811HXCE	£919.95
Linear Amp Ranger 811HXCE	£1295.95
Linear Amp Ranger 572B	£1395.95
Linear Amp Challenger Mk1V	£2449.95

Begali

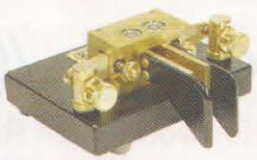
Begali Morse Keys

Magnetic Classic Gold

Camel Back Key	£129.95
Intrepid Semi-Auto Bug	£429.95
Magnetic Classic Iambic Paddle	From £199.95
Simplex Iambic Paddle	From £149.95
Simplex Mono Single Lever Paddle	£149.95
Sculpture Stainless & Carbon Iambic Paddle	£419.95

KENT KEYS Kent Keys

Hand Key Kit Build it yourself Straight key	£53.99
Twin Paddle Key Kit	£83.47
Single Paddle Key Kit	£61.20
Hand Key Wooden base	£71.44
Hand Key KT1 Steel base	£81.65
Twin Paddle Key	£89.95
Single Paddle Key	£74.50
Vail Key Correspondent replica	£199.95



Twin Key

ML&S are pleased to announce the famous Idiom Press range of CW Keyers and Digital Voice Keyers.

LogiKey K-5 An excellent fully iambic keyer with six active messages and 12 banked, 1530 characters in total. **£129.95.**

LogiTalker A stand-alone voice keyer with storage from 2 to 266 seconds. Can be configured for any radio. **£129.95.**

Idiom Press

Leads for any rig **£19.95.**

NEW Microbit RRC-1258mkIIS

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

NEW VERSION OLD PRICE £399.95

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

Tigertronics SL-USB

TigerTronics

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

From only £99.95

Call to discuss your rig-to-cable requirements.

MiniVNA pro
Pro-Antenna Analyser with Blu-Tooth.£379.95
SPECIAL OFFER £369.95

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

MiniVNA original still available
(without Bluetooth)
£259.95

OPENING HOURS

Monday to Friday: 9.00am to 5.30pm
Saturday: 9.30am to 4.30pm

Tel: 0345 2300 599

SAFE ONLINE SHOPPING

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

MasterCard DELTA VISA

ML&S martin lynch & sons

The World's Favourite Ham Store

20 Celebrating years ML&S

FRIENDLY, HELPFUL ADVICE

OUR ORDER HOTLINE

0345 2300 599

New!
GAP Antennas Available from stock

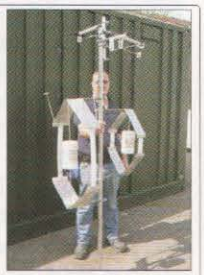
Eagle-DX 6-Band, 40-10m 2kW	Only £325.95
Titan-DX 8-Band, 80-10m 2kW	Only £345.95
Voyager-DX 4-Band 160-20m, 2kW 45ft tall!	£385.95
Challenger-DX 8-Band 80—2m (no 17)	£295.95

Isotron!

The most compact 1kW HF Antenna ever!

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

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



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

SAVE 10% AND free delivery on Isotron this month only. Call for details.

Hustler Antennas

HUSTLER

Base Station Range

Free standing, max 7.3m tall, 1kW

4-BTV	40/20/15/10m	£183.78
5-BTV	80/40/20/15/10m	£224.63
6-BTV	80/40/30/20/15/10m	£265.48

Mobile Range

200W or 1kW, both stocked. RM10 to RM-80 10M to 80m single-band whips. £24.95 to £56.95

The full mobile and base range and accessories available from stock, including the high power 1kW mobile range.

DX Engineering Products

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

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

DXE-363-SST Hi-quality bulkhead connector	£9.99
DXE-AOK-DCF Direct coax feed assembly	£26.99
DXE-BAL050-H10-AT High power transmission line transformer & baluns	£129.99
DXE-BDAB-1P Mounting kit	£27.99
DXE-CAVS-1P V clamp	£14.99
DXE-RADP-3 Stainless steel plate	£59.99
DXE-RADW-500KBD Bulk radial wire kit	£64.99
DXE-SAD-200A Saddle clamp	£12.99
DXE-VFCC-H05-A Vertical feedline current choke	£129.99

See www.hamradio.co.uk for the full DX Engineering range and technical information.

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

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

The UK's favourite rig-mounted antenna system

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

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

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

DIAMOND

Huge selection of Diamond products always available

Base Antennas

X-30	2/70, 3/5.5dB, 1.3m Long .. RRP £79.95	**SPECIAL £59.95**
X-50N	2/70, 4.5/7.2dB, 1.7m Long RRP £85.95	**SPECIAL £74.95**
X-300N	2/70, 6.5/9dB, 3.1m LongRRP £146.95	**SPECIAL £109.95**
V-1000	2/70/23, 8.3/11.7/13.7dB 5m Long RRP £149.95	**SPECIAL £99.95**
X-510N	2/70 Fibre glass 8.3/11.7dB gain. 5.2m long "N"	**£189.95**
V-2000	6/2/70, 2.15/6.2/8.4dB, 2.5m Long ..... RRP £149.95	**SPECIAL £109.95**

Mobile Antennas

NR-770R 100W, 2/70, 3/5.5dB, .98m Long	£39.95
NR-770RSP as NR-770 but spring loaded	£39.95
NR-770RSP As above but spring loaded	£44.95
NR-7900 2/70, 3.2/6.4dB, 1.46m Long	£69.95

Duplexers/Triplexers

MX-72N 1.6-150/400-460MHz Duplexer	£44.95
MX-62M1.6-56/140-470MHz Duplexer	£69.95
MX-610 HF/6+2+70 (for FT-8900)	£59.95
MX-2000 6/2/70 Triplexer	£91.95
MX-3000N 2/70/23 Triplexer	£86.95

Switches

CX-210A 2-way, SO-239 Die Cast	£53.95
CX-210N 2-way, N-Type, Die Cast	£82.95
CX-310A 3-way, SO-239, Die Cast	£89.95
CX-310N 3-way, N-Type, Die Cast	£114.95

SWR/PWR Meters

SX-100	1.6-60 MHz, 30W-300W-3KW	£144.95
SX-200	1.8-200 MHz, 5-20-200 Watts	£98.95
SX-1100	NEW MODEL 1.8-1300 MHZ, 5-20-200W PL-259/"N" (was SX-1000)	£249.95
SX-1000	1.8-1300 MHz, 5-20-200 Watts	£230.87
SX-40C	144-470MHz X needle Mobile Meter	£104.95
SX-20C	3.5-150MHz X needle Mobile Meter	£98.95
SX-240C	NEW MODEL 1.8-54MHz & 144-470MHz X needle 30W/300W/3KW (HF only)	£339.95
SX-27P	COMPACT 144/430, 60W Portable Meter	£45.93

NISSEI

One of the oldest names in Ham Radio

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

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

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

COMET

Comet SWR/Power Meter

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

Comet Antenna Tuner

CAT-300	300W Antenna Tuner	£194.08

Comet Wide-Band Vertical

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

Comet Rotary Dipole

H-422	4 Band trapped dipole	£275.82

Comet HF/VHF/UHF Base Antennas

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

Comet Handy Antennas

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

Comet Duplexers

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

Comet Triplexers

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

Miracle Antenna

Miracle Antenna **Hot new products!**

MMD-17 17M MIXED MODE DIPOLE,+ 5 BANDS with ATU	**£89.95**
MMD-20 20M MIXED MODE DIPOLE, OTHER BANDS with ATU	**£89.95**
MMD-30 30M MIXED MODE DIPOLE	**£99.95**
MMD-40 40M MIXED MODE DIPOLE	**£99.95**
Miracle Ducker iL HF-70cm Mini ATU with BNC	**£109.95**
Miracle Ducker HF-70cm with PL-259	**£109.95**
Miracle Antenna HF-70cm fitted with telescopic	**£109.95**

LDG

Factory appointed distributor with the largest stock of LDG outside the US.

THREE NEW SUPER MODELS FROM LDG

LDG Auto Tuner Range

NEW! YT-450	Auto Tuner for the FT-450 & FT-950	£224.63
NEW! YT-847	Want a really good Auto ATU for your FT-847? Here it is! £224.63	
NEW AT-600pro	600W Auto ATU	£299.95
AT-100proII NEW	Desktop tuner covering all frequencies from 1.8-54 MHz	£189.95
NEW AT-200proII	Designed for new generation of rigs	£209.95
AT-1000Pro	1kw 160m-6m (1.8-54MHz) High speed Auto ATU, tuning range 6-1000Ohms	£499.95
AT-897Plus	Bolt-on Alternative Auto Tuner for the FT-897. Wider tuning range and cheaper too! . £179.95	
IT-100	New version of the AT-7000	£159.95
YT-100	NEW AUTO ATU for FT-897/857 or FT-100 with additional Cat Port Control	£177.65
Z-817	Ultimate autotuner for QRP radios, including the Yaesu FT-817D	£119.95
Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£134.95
Z-11ProII NEW	Portable compact & tunes 100mW to 125W	£159.95
RCA-14	4-way DC Breakout Box	£52.12
KT-100	Dedicated tuner for Kenwood radios	£173.57
RBA-1:1	Probably the best 1:1balun out there	£35.69
RBA 4:1	Probably the best 4:1 balun out there	£35.69
FT-Meter	Neat Analogue back-lit Meter for FT-897/857. S-meter, TX Pwr, ALC Etc	£44.95
NEW FTL- Meter	Jumbo version of the famous FT-Meter	£79.95

CONTACT US
Martin Lynch & Sons Ltd.
Outline House, 73 Guildford Street,
Chertsey, Surrey KT16 9AS
Web: **www.hamradio.co.uk**
E-mail: **sales@hamradio.co.uk**

OPENING HOURS
Monday to Friday: 9.00am to 5.30pm
Saturday: 9.30am to 4.30pm

Tel: 0345 2300 599

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

MasterCard DELTA VISA

Crystal bridge

A balanced bridge for measuring quartz crystal parameters

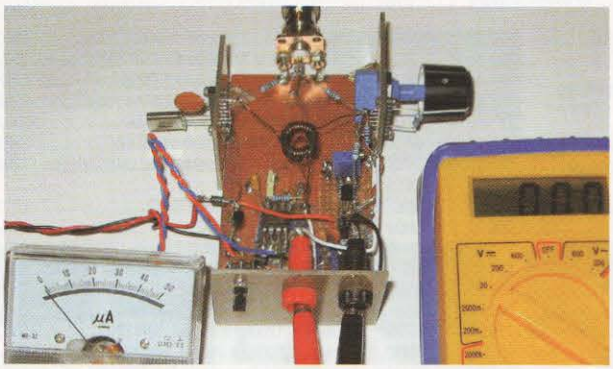


PHOTO 1: Prototype crystal bridge with associated meters.

INTRODUCTION. If crystal filters are to be designed with predictable responses, the crystals used must be accurately characterised. Many methods have been described over the years. These fall into two categories; one requiring a stable signal generator, the other using the crystal in an oscillator coupled to a frequency counter. An example of the first is the method specified in the IEC-444 standard, while an example of the latter is the oscillator scheme proposed some years ago by Dave Gordon-Smith, G3UUR, that appears in [1] and on many websites.

The oscillator method is attractive because good frequency counters are relatively inexpensive, while high quality signal generators are not. However, with the availability of direct digital synthesis (DDS) ICs and kits using these devices, high performance signal generators are now within the reach of many amateurs.

The equivalent circuit of the fundamental mode of a crystal is shown in **Figure 1**. It consists of a series tuned circuit consisting of the 'motional parameters' Cm, Lm and Rm, with a capacitor Ch in parallel, which is usually known as the holder capacitance. This is the capacitance between the areas of metallisation on either side of the quartz plate. The overtone modes add additional series LCR circuits in parallel with the fundamental, but these do not concern us and so will be ignored.

This article describes a method of measuring crystals based on a traditional bridge circuit. It uses a very sensitive detector and gives a direct read out of the motional resistance. By making a series of three measurements the series resonant frequency can be determined, the motional capacitance and inductance calculated and an estimate can be made of the holder capacitance.

THE BRIDGE CIRCUIT. The circuit of the bridge crystal measurement jig is shown in **Figure 2** and my prototype in **Photo 1**. One half of the bridge consists of R8 and a capacitor Cs in series with X1, the crystal to be measured. The other half of the bridge comprises R9 and the resistor Rs in series with the variable resistor R10. Very low resistance potentiometers are not readily available and so the right hand half of the bridge is at an impedance level of ten times the left side to allow a 100Ω potentiometer to be used. I chose a potentiometer with a linear carbon track, although a multiturn cermet track would probably be better. The total resistance in this arm of the bridge may need to be up to 500Ω to achieve balance, depending on the crystal motional resistance, and so a resistor Rs is fitted to increase the total resistance as required. Sections of turned pin IC sockets make satisfactory sockets for the crystal, the capacitor Cs and the resistor Rs.

A signal generator, terminated by R7, is connected to the bridge via C5. T1 consists of 10 turns on the bridge side and 5 turns on the detector side, wound opposite one another on a FT50A-43 core. It couples the centre points of the right and left arms of the bridge to logarithmic detector IC3. This IC consists of a series of amplifiers that limit progressively as the amplitude of the input signal increases. This method of operation is similar to that of a limiting amplifier in an FM receiver IF strip, but with the performance optimised for signal level measurement. The AD8307ANZ from Analog Devices is an ideal detector for this application and is very easy to use. It has a DC output that increases by 25mV for each 1dB increase in signal level, with a dynamic range of more than 80dB and a frequency response extending from audio to 500MHz.

Other detectors could be used, for example an RF voltmeter or an oscilloscope, but the logarithmic detector has the advantage of compressing the signal from the bridge to a DC voltage between about 0.5 and 2V, depending on the level of excitation to the bridge.

The output of the detector is buffered by IC1(b) and this drives an analogue meter, which is easier to use as a null detector than a digital multimeter. Switch S1 increases the sensitivity as the null point is approached. With no signal the output of this amplifier will be about 500mV, so to maximise the usable indicating range of the meter this voltage is subtracted from the output of IC1(b) by the circuit around TR3.

IC1(a) and TR1 form a constant current source, which is set to 1.00mA by means of the pre-set potentiometer R2. TR2 serves to isolate the current source from the bridge. The current flows to 0V through Rs and R10; the voltage across these two resistors is filtered by R12/C6 and monitored with a digital multimeter. The voltage in mV is numerically equal to the total resistance of Rs and R10 in ohms; it is ten times the motional resistance of the crystal when the bridge is balanced.

The crystal acts as a series tuned circuit and so the depth of the null of the bridge is very dependant the harmonic content of the signal source – harmonics need to be at least 60dB below the signal. Furthermore, the sensitivity of the detector is such that the series resonant frequency of many crystals can be determined to better than 1Hz. I built

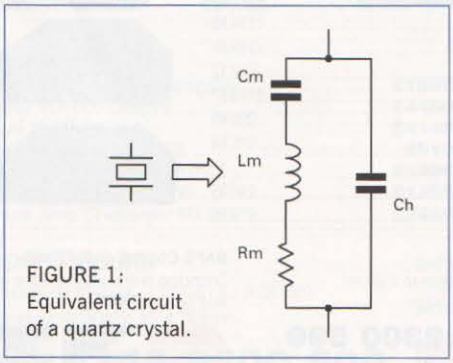


FIGURE 1: Equivalent circuit of a quartz crystal.

TABLE 1: MEASUREMENTS OF SEVERAL CRYSTALS

Frequency	10.00000MHz	10.00000MHz	4.91520MHz	4.91520MHz
Supplier	Farnell	Farnell	Farnell	Rapid
Part Code	971-3697	971-2356	971-2925	90-0205
Package	HC49/S	HC49/U	HC49/S	HC49/U
Fs	9,997,514Hz	9,997,482Hz	4,914,787Hz	4,914,125Hz
Cm	9.23fF	16.57fF	4.62fF	14.25fF
Lm	27.46mH	15.30mH	227.1mH	73.62mH
Rm	20.4Ω	9.1Ω	32.0Ω	13.8Ω
Qo	84,600	106,000	219,100	164,700
Cx	3.86pF	4.98pF	3.38pF	4.98pF
Ch	2.43pF	3.64pF	1.81pF	3.62pF

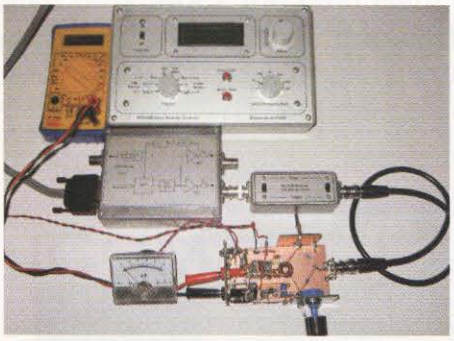


PHOTO 2: Crystal bridge with DDS signal source, band pass filter and meters.

a signal generator around an Analog Devices AD9834 DDS IC, controlled by a PICAXE processor. DDS-based signal generators inherently have a low harmonic content – my signal generator has a worst case second harmonic of -45dB – but I considered that this was insufficient and so I constructed band pass filters at the frequencies of interest to further reduce the harmonics. **Photo 2** shows the DDS with the crystal bridge and associated meters.

Conventional top-coupled band pass filters do not have particularly good attenuation characteristics above the filter pass band and so a filter design described by Wes Hayward, W7ZOI **[2]** was used. **Figure 3** shows the circuit diagram of a 10MHz filter with a 1MHz bandwidth and 50Ω input and output terminating resistances. The simulated response using SPICE **[3]**, with inductors with a Q of 90, is shown in **Figure 4** – the capacitance values used in the simulation are made up from standard values of NPO disc ceramic capacitors. The simulation shows that this design has an attenuation of 80dB at twice the design frequency. A filter was built using small off-the-shelf inductors with a tolerance of 10% and disc ceramic capacitors with a tolerance of 5% and had a measured response that was almost identical to the simulation.

DDS ICs also produce some low level spurious emissions. If it proves impossible to get a good null depth, the cause could be such an emission within the passband of the filter. Analog Devices has a design tool on the website that predicts spurious frequencies and amplitudes relative to the signal. For the measurements that I have made, the spurious frequencies were predicted to be -70dB below the signal and so could safely be ignored.

DDS kits are available that could form the basis of a signal generator. Alternatively, a VXO could be constructed, perhaps using one of the crystals from the batch to be measured. In this latter case a good band pass filter is essential to reduce the harmonics.

The current source can be set up by connecting a DMM in place of Rs and adjusting R2 to give exactly 1.00mA. There is no correction for the holder capacitance of the crystal – this was not found to be necessary.

D1 prevents damage in the event of reverse polarity. Series diodes have saved my circuits on more than one occasion!

CONSTRUCTION NOTES. My prototype is shown in Photo 1. I make no claims for neatness; it was put together using parts that were handy at the time. The only really important point to note is that the construction should be relatively robust, in that nothing must be able to move either during or between measurements.

USING THE BRIDGE. First of all, the series resonant frequency of the crystal, *Fs*, must be determined. Insert the crystal and put a link in place of *Cs*. Some experimentation may be necessary to ensure that a value for *Rs* is used that brings balance within range of the potentiometer; as a starting point I suggest 68Ω for crystals in HC49/U packages and 220Ω for those in low-profile HC49/S packages.

The signal generator should have an output about 0dBm (~200mV RMS) when terminated in 50Ω. This will give an output of about 2V from the logarithmic detector and a crystal dissipation of about 10μW.

The frequency of the signal generator and the potentiometer should both be adjusted to

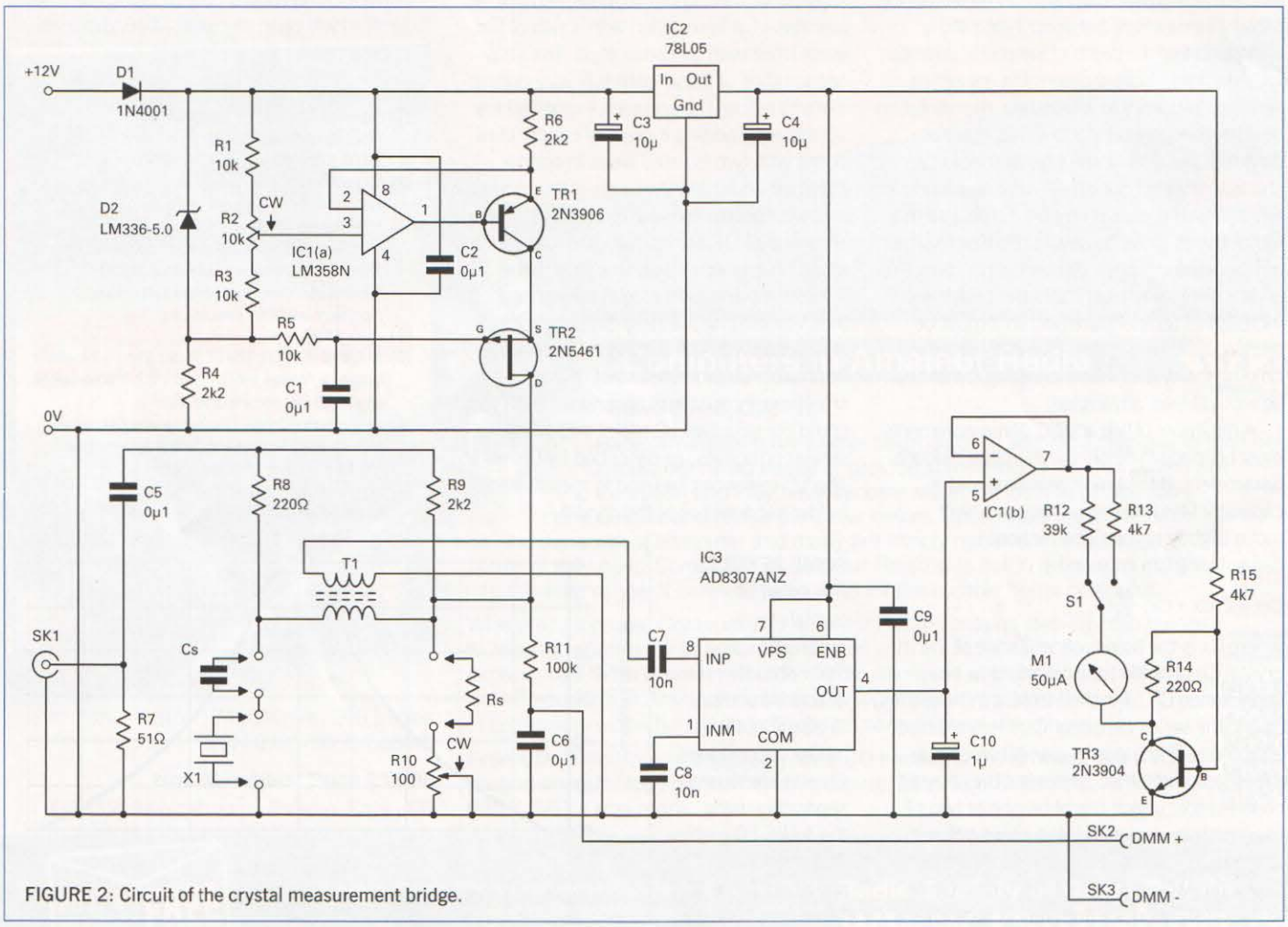


FIGURE 2: Circuit of the crystal measurement bridge.

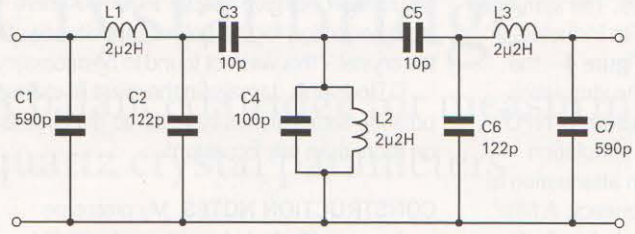


FIGURE 3: 10MHz, 1MHz bandwidth filter for 50Ω impedance.

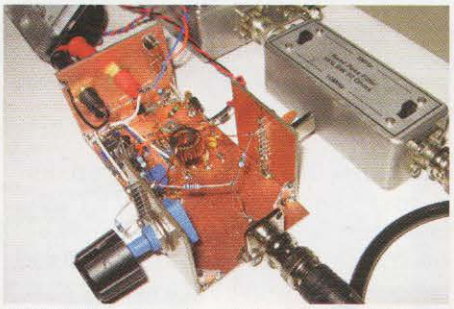


PHOTO 3: Another view of the prototype bridge.

obtain the lowest output voltage from the logarithmic detector. This will be at the series resonant frequency of the crystal. The motional resistance can now be read from the DMM by taking the voltage in mV and dividing by 10. The nominal frequency of most fundamental mode crystals is specified with defined load capacitances in parallel with the crystal, for example 30pF. The series resonant frequency will be a little lower than the marked frequency, usually somewhere between 1 and 4kHz.

I found that the depth of the null at balance was such that I could determine the series resonant frequency to within 1Hz, the resolution of my signal generator. However, there are some pitfalls. Firstly, the crystal should be shielded from air currents – moving around whilst making measurements can cause the frequency to move by several Hz due to small temperature changes. Secondly, handling the crystal in order to plug it into the bridge will increase its temperature and so it must be allowed time to stabilise. Some means of holding the crystal when plugging it into the jig would be an advantage.

A minimum of two additional measurements must be made to determine the other motional parameters. If the link is removed and a capacitor fitted, then the frequency will move slightly higher. The motional capacitance Cm is given by

$$Cm = 2\,(Cx + Cs)\,\frac{\Delta F}{Fs}$$

where Cx is the holder capacitance of the crystal Ch plus the measurement jig stray capacitance Cj; ΔF is the increase in frequency due to the series capacitor Cs. Here we meet a problem. The holder capacitance can be measured with an LC meter but the stray jig capacitance, which might be one or two pF in a carefully designed jig, is more difficult to measure reliably. Practical applications of crystals will add some stray capacitance to the crystal and so, arguably, a measure of Cx may be more useful than just Ch on its own. We need a procedure to derive a value for Cx.

If we make another measurement with a second value of Cs, then we have two equations with two unknown quantities and we can solve these as simultaneous equations. If we denote the two series capacitors as Cs1 and Cs2 and the changes in frequency caused by the addition of these capacitors ΔF1 and ΔF2, then Cm and Cx are given by

$$Cm = 2\,\frac{(Cs1 + Cs2)}{\left(\frac{1}{\Delta F1} - \frac{1}{\Delta F2}\right)}$$

and

$$Cx = \frac{Cs1\,\Delta F1 - Cs2\,\Delta F2}{\Delta F2 - \Delta F1}$$

For the best accuracy, Cs1 should be several times Cs2. 150pF and 33pF low temperature coefficient disc ceramic capacitors would be suitable. I used the low cost Multicomp MCCHU range, which is available from Farnell, as are most of the other components. I measured these capacitors with an AADE LC Meter II B [4]. This instrument is capable of measuring small value capacitors with a resolution of 0.01pF and has a zeroing facility to remove stray capacitance prior to measurement. As purchased, it is supplied with a pair of test leads fitted with crocodile clips. The stray capacitance of these leads will vary during use and reduce the accuracy. I modified my LC meter by adding a piece of copper clad board with two isolated areas of copper clamped under the terminals of the meter and with small crocodile clips and a section of turned pin IC socket soldered to the copper areas. In this way I was able to zero the instrument and then plug in capacitors, thus eliminating the stray capacitance associated with the test leads. If you do not have a suitable means of measuring small value capacitors accurately, then you could construct an LC meter that works on similar principles, as described by Carver [5]. The LC meter can be used to measure the holder capacitance of the crystal.

SOME RESULTS.

A number of crystals were measured using the method described earlier. In addition, the holder capacitance Ch was measured separately using the AADE LC meter. The results are shown in **Table 1**. The capacitors used for Cs were measured as 144.0pF and 33.0pF. The unit for the motional capacitance is fF (femtofarad). One femtofarad is equal to one thousandth of a picofarad (ie 10^{-15} Farad).

The jig capacitance Cj is the difference between Cx and Ch from Table 1 and is about 1.4pF. The accuracy of the motional capacitance is reliant on the actual values of the capacitors used in the measurements and, if possible, these should be measured rather than the marked values assumed. The above measurements agree well with other methods that I have used to measure these crystals. The highest frequency crystal that I have measured with the bridge is 10MHz.

I have used the bridge to measure crystals using up to nine values for Cs between 15pF and 440pF. If more than two capacitor values are used, I suggest using a spreadsheet to draw a graph of Cm plotted against Cs and then adjusting Cx by trial and error to give a horizontal line corresponding to a constant Cm; other values of Cx will give a curved line. This visual representation is much easier to assess than a list of numbers and the optimum value for Cx can be found very quickly.

The motional resistance of some crystals is known to vary with drive level. The resistance is usually constant for currents above about 20µA, according to [6], but rises at lower currents. The crystal current using this bridge method will be in the order of hundreds of microamps.

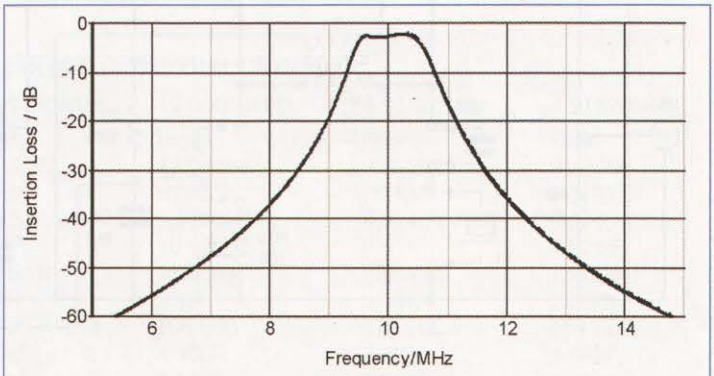
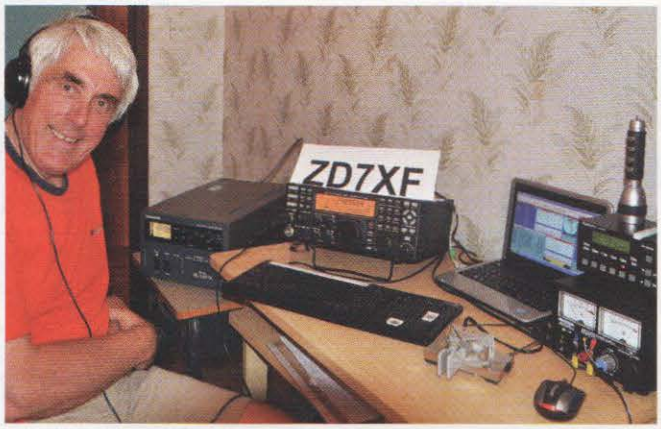


FIGURE 4: Simulated insertion loss of the filter.

WEBSEARCH
[1] *Experimental Methods in RF Design*, Wez Hayward, W7ZOI, Rick Campbell, KK7B & Bob Larkin, W7PUA, ARRL.
[2] *Mixed Form LC Bandpass Filter*, Wez Hayward, W7ZOI, w7zoi.net/mixed-bag/mixed_bag.html
[3] An evaluation copy of SPICE is available for download from www.simetrix.co.uk. This is fully functioning but with a limited number of nodes – this limitation is seldom a problem with filter simulations.
[4] www.AADE.com
[5] W Carver, K6OLG, *The LC Tester, Communications Quarterly*, Winter 1993, pp20 – 27. It is contained on the CD that accompanies [1].
[6] J Vig, *Quartz Crystal Resonators and Oscillators for frequency Control and Timing Applications* – A Tutorial, slide 150, www.ieee-uffc.org/frequency_control/teaching/vig/vig3_files/frame.htm#slide0332.htm

HF

A new entity and other news



Nigel, G3TXF operating on St Helena as ZD7XF (photo G3TXF).

SOUTH SUDAN ON THE AIR. The big news since last month's column was, as anticipated, the arrival on the scene of ST0R, operating from the newly-recognised Republic of South Sudan. In due course the ITU will no doubt allocate a unique prefix for the new country, but for the present they have been continuing to share the ST prefix with Sudan. As I write, the operation is in full swing and is expected to last until 10 August, though there appears to be at least one further team who have plans to operate from there in the near future and I daresay there will be almost continuous amateur radio activity for at least the next few years, by UN personnel if not by locals. Nevertheless, as expected, the initial demand was huge, with the world's DXers wanting to add this new one on as many bands and modes as possible. By the end of July, with over 60,000 contacts in the ST0R log, the leading UK chasers included G4CCZ and G4PWA, both with contacts on 9 bands (6 through 80) and three modes (CW, SSB and RTTY). There may well be others. For those who need the relevant background data for your logging program, it appears in the box. Wolf, OE1WHC of Vienna's Documentary Archives mentions that there is an overview page of Sudan's Amateur Radio history on the docufunk website.

I also want to commend the solo effort of Nigel, G3TXF to St Helena as ZD7XF, which netted some 12,000 CW contacts. Nigel did a great job and many UK stations were able to work him on 80 through 10 (he was not active on 160). Logs were updated daily both to ClubLog and LoTW.

MAJOR DXPEDITIONS. There are a number of significant DXpeditions to report this month, with organisers clearly wanting to cash in the better propagation that often occurs around the equinox. First, I must obviously mention T32C, Christmas Island, of which I will be a team member. Details have already appeared in *RadCom* so I will simply remind readers that we expect to be active from 1 to 23 October, all bands and modes, with 16 stations and 30 operators on site at any one time. Full details appear on our extensive website.

4W6A will be on from the rare Atauro Island (IOTA OC-232), Timor-Leste (East Timor), from 16 to 26 September. Activity will be on all bands CW, SSB and RTTY. The seven operators include Tim, M0URX, John, 9M6XRO (G3OOK), Anthony, MW0JZE and former *RadCom* editor Steve, 9M6DXX. QSL manager is M0URX, direct (SAE plus 1 IRC or $2), via the bureau, or LoTW.

YJ0VK will be the callsign of an international team operating from Vanuatu from 30 September until 12 October. Team members include VK3QB, VK3HJ, VK3BUF, VK3JDI, VK3GK, NQ7R, N6MUF and M0HLT. QSL via VK2CA.

A large team will activate Rotuma in the South Pacific from 27 September to 7 October. They will sign 3D2R and be active on all bands and modes but with an emphasis on the LF bands. There is also a report that HL5FUA and 6K2GCW will be on Rotuma earlier in September, on 80 through 10, all modes, with the callsign 3D2CJ, but when I checked there was no sign of the advertised website.

All in all, it looks like a good time to be pointing your antennas at the Pacific and hoping for minimal auroral activity which, of course, adversely affects propagation over the poles. It is to be hoped that the various expeditions that will be active concurrently will take care to avoid mutual interference. The good news in this day and age is that a DXpedition can turn up pretty much anywhere in a band and be guaranteed a healthy number of callers, as spots will appear almost immediately on the Cluster and Reverse Beacon networks. So don't necessarily expect the various operations to stick to the acknowledged DXpedition frequencies (21295, 28495, etc.) where one would have tended to look in the past.

OTHER DX NEWS. Phil, F6GNT, is on Mayotte Island for the next two years. He is using the temporary callsign FH/F6GNT but should have an FH call by the time this appears. He will be operating on SSB only on all bands.

Take, JG8NQJ, is now active as JG8NQJ/JD1 from Marcus Island in the Minami Torishima (OC-073) group until mid-October, but will return again in December. So far activity has been only 30 and 17. However, when Take returns to the island at the end of the year, he will be active on all bands. QSL via his home callsign, by the Bureau or direct to JA8CJY.

A group of 5 to 7 members of the Cambridge University Wireless Society (G6UW & M4A) will be active from Miquelon between 23 and 30 September on 80 through 10, possibly with some 160m operation. Look for FP/G3ZAY, FP/G4EAG, FP/M0TOC, FP/M0BLF and FP/M0VFC. There may be one or two additional operators.

New Zealand amateur radio operators may use the special prefix ZM during the months of September and October to celebrate the Rugby World Cup. In addition special Rugby World Cup (RWC) calls ZL6RWCN (Northern Districts), ZL6RWCC (Central Districts), ZL6RWCM (Midlands Districts) and ZL6RWCS (Southern Districts) will be active, as well as ZL4RUGBY from 19 August to 31 October.

Gab, HA3JB, has received his renewed licence to operate in Egypt as SU/HA3JB from 1 September until 30 November. He plans to be on CW, SSB, RTTY, PSK and some SSTV. Gab was there in 2010 using the same call and prefers no duplicate contacts (dupes) this year. Activity will be on all bands. QSL via HA3JB.

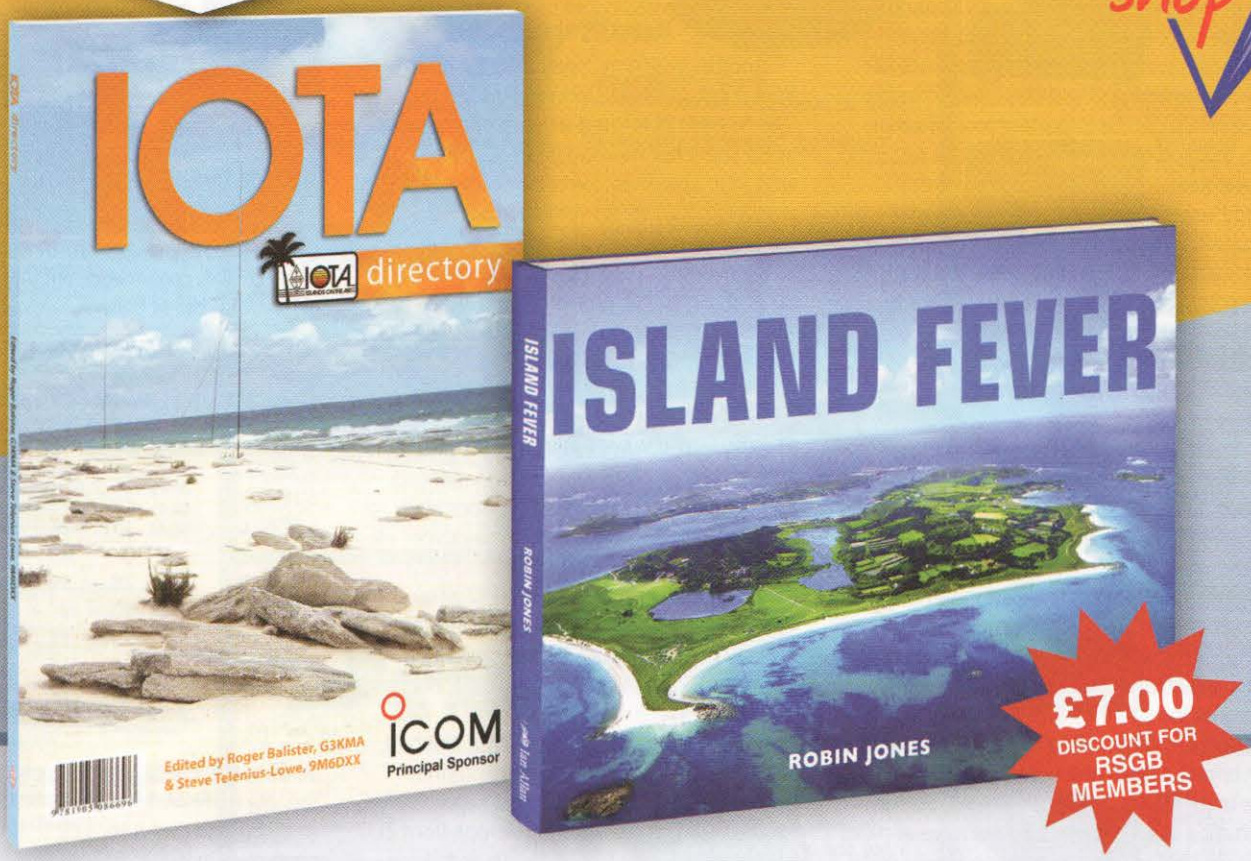
Arnold, WB6OJB, is reported to be heading back to Lesotho where he will be operating again as 7P8JK from 15 to 22 September. QSL via his home call.

ORGANISING AN EXPEDITION. There was a lot of discussion during the ST0R operation about the quality of the DXpedition operators. As usual, I got the impression that views about their ability changed the more band slots one had in the log! But it got me thinking about what it takes to make an effective DXpedition. Because it isn't simply about operator ability, even though, in an ideal world, all the operators would be top notch. Any expedition requires a lot of planning, which involves everything from negotiating skills (contracts with hotels and ships, getting the licence out of unresponsive third-world bureaucrats, etc) to fully-fledged project management.

There are human resources skills in putting together a team that will blend and work as one (I recall tales on some expeditions of splinter groups forming and doing their own thing). There are technical skills to ensure that the equipment (which increasingly means the IT side of things, especially with demands for online logs, instant LoTW, etc)

NEW

RSGB shop



IOTA Directory

from £10.19

Edited by Roger Balister, G3KMA & Steve Telenius-Lowe, 9M6DXX

The newly updated IOTA Directory is the essential guide to participating in the Islands on the Air (IOTA) award programme. This edition contains all the recent rule changes and island updates of this dynamic and exciting programme.

The *IOTA Directory* is the complete, official listing of IOTA islands but is much more than just a simple list. A colour section contains fascinating reports of several IOTA operations from "Ulituqisalik Island" in the Arctic, through to the romantically named "Flint Island" in the middle of the Pacific Ocean. Contesters will find the report and results of the 2010 IOTA Contest and details of the contest in 2011. There is much more besides with details of the latest IOTA Honour Roll, Golden List, etc. The *IOTA Directory* provides everything you need to participate in IOTA, from lists of islands, grouped by continent, and indexed by prefix through to application forms and masses of information and advice for island hunters, award applicants and DXpeditioners alike.

If the simple act of collecting QSL cards from around the world hasn't appealed before, the multitude of islands and the fascinating IOTA programme laid out in this book will change your mind. The *IOTA Directory* is a must have if you are already involved or simply just interested.

Size 210x297mm, 128 pages, ISBN 9781-9050-8669-6

Non Members' Price £11.99

RSGB Members' Price £10.19

ISLAND FEVER

from £12.99

By Robin Jones

If you have ever dreamed of mounting a DXpedition to a far flung part of the world, yet it has never come to pass, this book could easily be a trigger for something closer to home. Packed with potential IOTA activations, low noise enviroments, spots with a large body of salt water on the doorstep, *Island Fever* is a great book.

Britain is an island nation with hundreds of smaller islands off the mainland shores, each with its own distinct character. *Island Fever* provides an insight into the some the islands of England and Wales. There are forty chapters in this full colour hard back book covering hundreds of individual islands. Each chapter provides an insight into the islands covered in both text and pictures. From the Marconi's activity on Flat Holm in the Bristol Channel in 1897, through historic Lindisfarne, to the WWII Red Sands forts, this book is packed with interesting stories. The glossy pages host nearly 300 top quality photographs which highlight some of the well known and many lesser known scenic parts of the British Isles that may well tempt you into that DXpedition you have promised yourself.

At this special 35% discount for RSGB members *Island Fever* is fascinating and informative book and a great buy.

Hardback, Size 224x297mm, 160 pages
ISBN 9780-7110-3471-6

Non Members' Price £19.99

RSGB Members' Price £12.99 (35% off)

POST & PACKAGING FREE from ROW
See page 76 for full details

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

Radio Society of Great Britain
www.rsgbshop.org

all works together and flawlessly (most DXpedition locations are some way from the local electronics emporium!). Then there are antenna erection skills – many competent operators with decent home stations have never had the experience of erecting antennas Field Day style. Physical endurance can be important too, whether it is to stand the extreme cold of the Antarctic or the heat and mosquitoes of the tropics. And I've yet to mention raising financial support or, if you don't believe in expeditions asking for money, finding operators with deep enough pockets to take part, not to mention having the time available to jet off (or take a long boat trip) to places that Ryanair haven't even heard of, never mind fly to.

But these folk, who bring one or more of these estimable skills to the project, expect to be allowed to operate, too, even if they may not be the best pile-up operators in the world. Unreasoanble? I recall one huge contest effort in the Caribbean ending up second in CQWW multi-multi because some of the antenna gurus (who had put in huge effort, and given up time and money too, just the same as everyone else) expected to have some operating slots, which ended up bringing down the overall rate. Should the team leader (assuming there was one – that's a whole different issue) have allowed this, or should he have sidelined them once the antennas were up?

In some ways it's a wonder any of these expeditions succeed at all! Neville, G3NUG occasionally reminds me that I was the one who likened our FSDXA trips to the proverbial swan, appearing to swim serenely along but paddling furiously under the surface. It is relatively easy for a two- or three-person team to work effectively together, but they won't be able to be on all bands 24 hours a day. Roger, G3SXW has noted that the Voodoo contest group trips seem to work best when the team is limited to 7 or 8. Get much beyond that and sub-groups start to form. But to do a major all-band 24/7 operation takes more operators than that. The website suggests that STOR had 14. At T32C we will have 41, though not all on the island at the same time. The management task is immense and it is hardly surprising that things go pear-shaped from time to time, whether by way of equipment failures, health problems (exhaustion and dehydration are by no means uncommon), team arguments and sloppy operating. Thank goodness it's only a hobby!

CORRESPONDENCE AND TABLES. Les, GM3ITN writes to tell me that he currently heads the DXCC standings for the UK with 383 all-time confirmed. He says he wanted to let a few of his competitors know where he was and that he was still in there chasing! Les says that although he suffers a bit these days from back pain and arthritis he still enjoys his daily dose of RF and a wee whisky! He has a website dedicated to supporting DX and DXers.

Another welcome 'snail mail' letter arrives from John, G3BDQ. John makes the point that he has never used a beam of any sort in 65 years but has had great success with wire antennas. He is currently using a novel linear-loaded vertical with two 20ft top loading sections, also linear-loaded. In the evenings (between 2000 and 2100) on 20m he has recently worked (all CW) XU7SSB, BV2DU, BV100, 7N1PRD/0 (Japan), R0QA, VR2KP, HS0ZEE, 5X1VJ, OA1F, CO6RD, PZ1DV, OX3XR, CX5BP, CX5DW, 5N6/YL2SW, 6D5RV/4 (Mexico), ZP6CW, 6Y5WAA, ZF2UQ, HI3TT and HL1/WX8C plus many PY and JA stations. John expects to have an article about his antenna published in another magazine later in the year.

Chris, G4UDG writes that he took his Icom 7200 and Super Antennas MP1 on holiday near Aberystwyth and managed to work 37 countries including EX2, RA9, 5N6, H77, VU2, PY, JA1, 4Z5, 4L4, 4K6 and W1, mainly with 50W of CW, Not bad, as he says, for a 6ft multiband antenna!

Peter, G3HQT congratulates Nigel, G3TXF, for the way he handled the pile-ups from ZD7 and reports contacts this month as follows: 30 CW ZD7XF, 5C12M, PY0FO and YW5LR (SA035), 30 PSK YV7MAE (SA012), 30 RTTY JX5O, 17 CW FS/K9EL, V5/ZS6AYU, A25/ZS6AYU and 5T0JL and on, 12 CW, BY1RX/4 (AS160) and FP/VA2WA.

Graeme, G6CSY asks the question that is on everyone's mind, "When will the bands improve?" He tended to focus on the WARC bands and on 30 CW reports contacts with OJ0/SA5BJM (EU-053) for a new island, with the JX5O expedition on EU-022 for an all-time-new entity and LX/ON5QRP/P in WFF area LXFF-038. 17 accounted for ZP6CW for an all-time-new as well as TA1C/2 and HG0WFF in WFF area HAFF-009. Also doing good business was the Tour de France special event station TM98TF.

John, G3SAO writes, "I am now active again after about 15 years away from the bands and operate QRP only using an FT-817 into a tuned doublet antenna. In spite of the relatively poor conditions and increased local noise levels when compared to a few years ago I am having fun and managing to work some DX. My best so far is RU9UC and recent log entries have included UN8LWF, OX3XR and ZA/Z35M/P, all on 20 CW. I've been pleasantly surprised by what can be achieved with less than 5W and a simple antenna".

SILENT KEYS. I want to record the recent passing of Henry Lewis, G3GIQ. Henry was a long-time DXer, a personal friend, and compiled the all-time tables for this column since well before I took over from the late G3FKM. Henry was first licensed in 1950 and had 336/371 (current/total) confirmed in the ARRL DXCC standings. He was a founding member of the Chiltern DX Club, The UK DX Foundation and a member of the GMDX Group. I well remember Henry hosting get-togethers for visiting DX operators at his London home in the early 80s. As far as the future of the 9-band tables is concerned, my initial thoughts are that they might usefully be migrated to the RSGB website and I have agreed this in principle with the Acting GM. But I will take over their compilation, so please send me your updates at the earliest opportunity, so that I can at least have a good starting point.

I was also saddened to hear of the passing of Jens Sperling, DL7AKC, at the young age of 45. He was an excellent and active CW operator as well as always being good company and was with us on two of our FSDXA DXpeditions.

G4DYO (left) exchanges XY0RR QSLs with G3GIQ in 1991. This confirmation put them both on top of the DXCC Honor Roll.

2011 TABLE

(starting 1/1/11, WARC bands and all-band)

Call	30m	17m	12m	ALL
MU0FAL	65	54	69	142
G3HQT	152	135	52	
G3SED	17	16	40	
G4DXW	0	69	21	
G4XEX	28	38	19	88
M0BVE	25	9	4	137
G6CSY	29	12	2	43
M0VKY	0	15	1	164
G4FVK	4	12	1	75

THANKS. Special thanks go to the authors of the following for information extracted: OPDX Bulletin (KB8NW), The Daily DX (W3UR) and 425 DX News (I1JQJ). Please send items for the November issue by Saturday 17 September (*please note, roughly a week earlier than usual as I will be heading off to Christmas Island*).

WEBSEARCH

3D2R: http://www.yt1ad.info/3d2r/index.html
4W6A: http://www.4w6a.com
Dokufunk (Sudan): www.dokufunk.org/sudan
GM3ITN: www.gm3itn.co.uk
YJ0VK: http://yj0vk.vkham.com

nevada radio warehouse

Ecoflex®

New Ecoflex Low Loss Cables & Connectors at Nevada!

New range of cables & connectors at Nevada! Flexible with PE-LLC dielectric and gas content of over 70% for very low loss and use up to 6 GHz

Ecoflex 15

Specification
- Diameter: 14.6mm
- Loss per 100m: 2.81dB @ 100MHz, 1.96 dB @ 50MHz

Price: £5.99 per metre, **£539** per 100m drum

Ecoflex 15 Connectors
- **PL259** connector (Part: 7350) **£8.95**
- **N type** connector (Part: 7395) **£9.95**

Ecoflex 10

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

Price: £2.89 per mtr, **£260** per 100m drum

Ecoflex 10 Connectors
- **PL259** connector (part: 7378) **£5.95**
- **N type** connector (part: 7367) **£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

Aircell

Aircell range is a highly flexible coaxial cable for use up to 6 GHz. The low losses in relation to the diameter and the small bend radius of the cable make it perfect for the Radio Amateur.

Aircell 5

Specification
- Diameter: 5.0mm
- Loss per 100m: 9.4dB @ 100MHz, 6.61dB @ 50MHz

Price: £1.39 per mtr, **£125.00** per 100m drum

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

Aircell 7

Specification
- Diameter: 7.3mm
- Loss per 100m: 6.28dB @ 100MHz, 4.52dB @ 50MHz

Price: £1.99 per mtr, **£179** per 100m drum

Aircell 7 Connectors
- **PL259** connector (part: 7390) **£2.65**
- **N type** connector (part: 7392) **£5.25**
- **BNC type** connector (part: 7371) ...**£5.25**

Aircom Plus

Operating up to 10 GHz, this semi Air spaced cable has a massive oxygen free copper inner conductor covered with a thin film of PE to prevent corrosion permanently

Aircom Plus

Specification
- Diameter: 10.3mm
- Loss per 100m: 3.8dB @ 100MHz, 2.6 dB @ 50MHz

Price: £3.65 per mtr, **£328.00** per 100m drum

Aircom Plus Connectors
- **PL259** connector (part: 7378) **£5.95**
- **N type** connector (part: 7367).....**£6.50**
- **BNC type** connector (part: 7379) ...**£6.50**

MFJ Accessories

MFJ 16C06...4 pack Ceramic Insulators	£5.95
MFJ 259B....HF/VHF Analyser	£259.95
MFJ 260C....300W Dummy Load	£45.95
MFJ 269.....HF/VHF/UHF Analyser	£349.95
MFJ 260C....300W Dummy Load	£45.95
MFJ 550.....Practice Morse Key	£16.95
MFJ 557.....Morse Key With Oscillator	£45.95
MFJ 901B....Portable 200 Watts ATU	£109.95
MFJ 912.....Remote Balun Box	£79.95
MFJ 931.....Artificial Ground	£114.95
MFJ 941E....300W Versa-Tuner II	£139.95
MFJ 949E....300W 1.8-30Mhz Antenna Tuner	£179.95
MFJ 969.....300W HF + 6m Antenna Tuner	£219.95
MFJ 971.....200W Portable AntennaTuner	£122.95
MFJ 993B....300W Fast Automatic Tuner	£254.95
MFJ 1025....Noise Canceller/Enhancer	£184.95
MFJ 1026....Noise Canceller + Active Antenna	£204.95

Anytone AT-5189D
- 4m (70MHz) FM Transceiver
- Up to 25 Watts output
- Includes optional DTMF hand microphone

£148.95

Anytone AT-588
- 2m (145MHz) FM Mobile Transceiver
- 10/25/60 Watts selectable power output
- Includes QHM-03 DTMF multifunction microphone

£149.95

NEW

Anytone AT-5555-N
- 10m (28MHz) All Mode Mobile Transceiver
- Up to 21 Watts PEP SSB
- Fully programmable with optional pack

£149.95

Anytone AT-5555PC
- Control Software Disk & USB Lead Kit
- Programs the AT5555 from 25-30MHz

£14.95

Anytone AT-5189PC
- Control Software Disk & USB to modular plug lead kit
- Programs the AT5189 70MHz Transceiver

£14.95

Large selection of QUALITY USED EQUIPMENT in stock! Visit our web for latest details

AirNav RadarBox Pro	Real Time Virtual Radar 299	Kenwood TS-570	DG.5-100w Base/Mobile HF TX 589
Bearcat UBC-800XLT	6000 Ch Desktop Scanner 225	Kinetics SBS-1	Real-Time Virtual Radar RX 299
Bearcat UBC9000XLT	500 Ch Desktop Scanner 199	MFJ 784	Advanced Tunable DSP Filter 229
Icom IC475H	70Cms All Mode 75W TX 399	Yaesu FT2000	HF/6m 100w all mode TX 1399
Icom IC-575A	Classic 28/50Mhz All Mode TX 425	Yaesu FT1000MP	HF+DSP/ATU/PSU Boxed 1199
Icom R75	1-60Mhz Comms RX with PSU 499	Yaesu FT450AT	HF/6m Portable/Base TX Boxed 599
Icom IC-7800	Flagship HF/6m TX immaculate 5495	Yaesu FRG-100	Desktop Communications RX 329

NEVADA – Cable Specialists

Westflex 103

100 metre drum	£139.95
75 metre length	£106.86
50 metre length	£71.24
Price Per metre	£1.50

RG-213U – Mil Spec

100 metre drum	£116.00
50 metre length	£62.50
Price per metre	£1.29

RG-213tm – Economy version

100 metre drums	£99.00

RG-Mini 8 (Super XX)

100 metre drum	£59.95
Price per metre	£0.65

RG58/CU – Mil spec

100 metre drum	£39.95
Price per metre	£0.45

450 Ohm Twin Feeder

100 metre drum	£89.00
Price per metre	£0.99

300 Ohm Twin feeder

100 metre drum	£76.50
Price per metre	£0.85

Flexweave Antenna Wire

100 metre drums	£49.95
Price per metre	£0.55

Coated Flexweave Antenna Wire

100 metre drums	£88.00
Price per metre	£0.98

Antenna Collection

VHF/UHF Base Antennas

Comet	
GP1 .....145/433MHz 3/6 dbi 1.25m	59.95
GP3 .....145/433MHz 4.5/7.2dbi 1.78m	69.95
GP6 .....145/433MHz 6.5/9.0dbi 3.07m	99.95
GP15N....50/145/433MHz 3/6.2/8.6dbi 2.42m	99.95
GP98 .....145/433/1200MHz 2.94m Length	139.00
CA-52HB4..High-Gain 4 Ele Beam 50MHz (6M)	119.00
Diamond	
V-2000 ..50/144/430 MHz 2.5m	127.67
Nevada Professional Series	
WDM8010-Pro.....132' MiL Spec Kevlar Windom Antenna 80-10m 1kW	79.95
WDM4010-Pro.....66' MiL Spec Kevlar Windom Antenna 40-10m 1kW	69.95
Sirio	
CX4 .....70MHz (4m) 4.15dBi 2.9m Length	69.95
SY68-3....70MHz (4m) 3 Element Yagi Beam	79.95
Gainmaster...Fibreglass 10m (28MHz) Vertical	129.95
Tornado ..Vertical Base Antenna 50MHz (6m)	49.95
Vector **NEW** 4000 Big 10m (28MHz) Vertical	89.95
2008.....High Gain 10m (28MHz) Vertical	89.95

HF Base Antennas

Comet H-422....40/20/15/10m Dipole	269.95
Comet CHA-250BL...6 to 80m Vertical	299.95
Sirio SY27-3...3 Element 28 MHz Yagi	74.95
Sirio SY27-4...4 Element 28MHz Yagi	89.95
Moonraker GP-2500...6-80 mtr Vert	199.95

HF Wire Antennas

Van Gorden.....G5RV 40-10mtrs	21.95
WDM3....40/10mtr Heavy Duty Windom	69.95
WDM4....80/10mtr Heavy Duty Windom	89.95
WDM-8010.....Std. 80/10 Windom	44.95
WDM-4010.....Std. 40/10 Windom	39.95

PALSTAR® Power Supplies

SPECIAL PRICE!

PS 8250
25 Amp Switch Mode Supply
- Twin meters for current and Voltage
- Lightweight
- Fully protected

~~£99.95~~ **£79.95**

SPS-9600
60 Amp Switch Mode Supply
- Variable output voltage
- Fully protected

£199.95

PS-50
50 Amp (peak) Bench Supply
- Fully protected
- Voltage and Current metering

£199.95

PS-30M
30 Amp (peak) Linear Supply
- Variable Voltage
- Fully protected

£99.95

Other Palstar supplies

PS-04	4A 13.8V DC supply	£24.95
PS-06	6A 13.8V DC supply	£29.95
PS-15	15A 13.8V DC supply	£59.95
SPA-8230	23A 13.8V DC Switch Mode	£59.95

LDG Tuners
Popular Models
NOW in STOCK!

AT100 Pro II	(160-6m) 125 Watts	£189.95
AT200 Pro	(160 - 6m) 250 Watts	£204.95
AT600 Pro	600W Auto Antenna Tuner	£299.95
AT897 Plus	for Yaesu FT897	£179.95
AT1000 Pro	(160 - 6m) 1kW	£499.95
IT100	for Icom Models 125 Watts	£159.95
YT100	for Yaesu Models 125 W	£179.95
YT450	for Yaesu FT450/950	£224.95
Z11 Pro2	(160 - 6m)125 Watts	£159.95
Z817	QRP for FT817 160 - 6m	£119.95
FTL	Meter for FT857, FT897	£79.95
Balun 1:1	200 Watts	£34.95
Balun 4:1	200 Watts	£34.95

Icom IC-7000
All Band HF/VHF/UHF

NOW £1189.95

Kenwood TS590S
Latest HF/6m

NOW £1339.95

Kenwood TS480SAT
100 Watts HF/6m

NOW £779.95

Kenwood TH-D72E
High performance handheld

NOW £429.95

Yaesu FT450D
HF/6m with ATU/DSP

NOW £849.95

Yaesu FT817ND
Low power HF/VHF/UHF portable

NOW £549.00

Yaesu FT857D
Mobile HF/VHF/UHF all modes

NOW £699.95

Yaesu FT897D
All mode multibander

NOW £799.95

Yaesu FT7900E
New twinband mobile 2m/70cms

NOW £249.95

NEW

TYT-UVF1
Dual Band Transceiver
- 2m/70cms
- 128 Memories
- C/w re-chargeable battery pack, drop in charger, power supply +more!

£99.95

NEW

TYT-800
VHF 2 Metre 5W Handheld
- 199 Memories
- Steps: 5, 10, 12.5, 20, 25, 30, 50kHz
- 50 CTCSS codes
- VOX time-lapse

£49.95

For unbeatable deals online 24hr shopping 7 days a week

www.nevadaradio.co.uk

PHONE **023 9231 3090**

Unit 1 Fitzherbert Spur Farlington Portsmouth Hampshire PO6 1TT email sales@nevada.co.uk showroom hours Monday to Friday 9.00 - 17.30

VHF/UHF

An extraordinary Sporadic-E opening to Israel on the 144MHz band

PHOTO 1: The VHF antennas at the QTH of Dave Edwards, G7RAU.

PROPAGATION EVENTS. As expected Sporadic-E (Es) openings were reported every day on the 50MHz band throughout July. Even so the intensity and duration of these events did not seem as good as has been experienced in previous years. However transatlantic openings to North and South America, some in excess of 7,000km, were reported on many days – as were openings to the Middle East. On one occasion there was an opening to the Far East with contacts being made up to 11,300km away. E-layer propagation was also prevalent on the 70MHz band with openings to much of Europe being reported on most days during the period. The experimental 70MHz beacon, WE9XUP (USA, FM07), was also heard on two occasions in both England and Wales over 6,000km distant. Propagation was surprisingly good on the 144MHz band with a healthy number of Es openings being reported during July. An extraordinary contact was achieved between England and Israel and 4X-stations were also heard in Wales, some 3,766km distant! A few brief auroral and auroral-Es openings on the 50MHz band were also reported during the month by Scottish stations. Tropospheric propagation was reasonably favourable for 144MHz and 432MHz operators with occasional openings into Scandinavia, central Europe and the Iberian peninsular. Some 144MHz stations in Cornwall also reported contacts into the Canary Islands, with tropo paths approaching 2,700km.

THE 50MHz BAND. With the exception of just one day, Es openings were reported every day during June, with contacts being made all over Europe and far beyond. What was a surprise is the number of 50MHz transatlantic openings to North and South America, with such events occurring on 25 days during June. Many of these openings were quite weak, as is the nature of this type of multi-hop propagation. It is therefore quite possible that many UK stations missed out on working new DXCC countries because they have the mindset of only listening out for the loudest SSB signals. The real DX is often quite weak and invariably uses CW!

Some of the DX contacted from the UK during June included the stations of 9Y4D, 9Y4VU (Trinidad and Tobago), FG5FR, FG5GP (Guadeloupe), FM5AA, FM5WD (Martinique), FS/K9EL (French Saint Martin), HI3TEJ, HI8LAM (Dominican Republic), HR9/WQ7R (Honduras), KP4BJD, KP4EIT (Puerto Rico), P43L (Aruba), PJ2BVU, PJ2LS (Curaçao), PJ4E (Bonaire), PJ6D (Saba), PJ7MF, PJ76 (Sint Maarten), PV8ABC, PV8AZ (Brazil), V25DR (Antigua), V44KAI (Saint Kitts and Nevis), VO1DJT, VY2ZM (Canada), W4DR, WZ8D (United States), XE2OR (Mexico), YV5ESN and YV7RCM (Venezuela). To add a bit of spice to the mix there was also a good opening to the Far East on 28 June and contacts were made from southern England with BA4SI (China), DU1GM, DU7/PA0HIP (Philippines), JE1BMJ (Japan) and VR2XMT (Hong Kong). The opening, by the way, occurred between 0930-1030UTC, around the normal time for such contacts over this path. Propagation at times was excellent: Neil Carr, G0JHC (Lancashire, IO83) reported that he heard the station of DU7/PA0HIP with CW signals peaking 599 over the 11,314km path.

Welcome to John Plenderleith, 9M6XRO (Sabah, East Malaysia), who sends in his first report of 50MHz activity from his part of the world. When he is active he often monitors 50.110MHz using a Yaesu FT-920 transceiver, a Quadra 400W amplifier and a 3-element Quad mounted on top of his apartment building. John mentions that good DX openings have been few and far between this season, even to East Asia (China, Japan, South Korea). Local activity is virtually non-existent and working Japan is not local, JA being 4,000-5,000km away. He reports that there was a good opening to Europe on 24 June when he worked the stations of 9A2SB, ER0FEO, HA7TM, LZ1QI, OE4VIE, S57TW, SP8AWL, UK8OM, YO3BL and YU1AU. He actually contacted quite a number of 50MHz operators from each of those countries, all of them new DXCC, plus other southern Europeans.

On 1 July there was an even better opening with 9H1BT, A45XR, CT1HZE, EA7HG, OK7XX, T77C and VU2RBI, again all new ones, getting in the 9M6XRO log. Almost at the end of the event he contacted CT3HF on the island of Madeira at a distance of 13,444km. During the opening John also worked DL1YM (Germany, JN59) which was as close as he got to the UK although he was informed later that a G-station did hear him peaking S2 for a brief time. For the remainder of July the only other Es of note was on 16 July when he contacted over 80 Japanese stations some 4,000km distant plus the occasional stations in Taiwan (BV) and South Korea (HL). John mentions that he has now worked 42 DXCC entities on 50MHz, which he thinks is not too bad considering that there are very few countries within easy reach to push the score up.

Propagation in the UK during July was quite good with Es openings being reported every day throughout the month. Some of European and nearer African DX available included the stations of 4Z5LA (Israel), 5C12M (Morocco), 7X2VX (Algeria), EA8YK (Canary Islands), EA9IB (Ceuta), J48YA (Greece), ST0R (Sudan), SV5/G0TSM (Dodecanese), SY9VHF (Crete) and TA7OM (Turkey). It did appear though that the best

DX paths were to the west of the UK with 17 days of transatlantic openings to North and South America being reported between 1-22 July. The DX contacted was very similar to the June listings with stations in 9Y, FG, FS, HI, KP4, PJ2, PJ6, PJ7, PY, VE, W, YV being worked as were the stations of HP3TA (Panama) and OA4TT (Peru). Contacts were also made to the Middle East region with A45XR (Oman), A65BP (United Arab Emirates), A71EM (Qatar), A92GR and A92IO (Bahrain).

THE 144MHz BAND. Considering there were only three days of Es openings during June I really had given up hope that events would improve during July. However I was wrong as this form of exciting propagation took a significant turn for the better with a total of nine days during July when long-distance contacts could be made on the 144MHz band.

Three periods of Es activity occurred on 1 July, the first between 1355-1430UTC to Russia and Ukraine, a small blip around 1555UTC to Croatia and a much more extensive and exciting opening between 1735-1915UTC to stations situated in south-eastern Europe. The first opening of the afternoon, at 1355UTC, saw a few operators in southern England making SSB contacts with stations that included UU4JMG (KN85), UU5AI (KN65) and UC6A (KN84). Later that afternoon at 1555UTC the Croatian radio club 9A1CRS (JN95) was reported being heard in West Yorkshire but no other 144MHz stations were apparently heard at this time. The main opening of the day occurred in the early evening with stations throughout much of England and Wales making contacts into Hungary (HA), Slovakia (OM), Italy (I), Croatia (9A), Slovenia (S5), Bosnia-Herzegovina (E7), Montenegro (4O), Serbia (YU), Bulgaria (LZ), Greece (SV), Dodecanese (SV5), Crete (SV9), Turkey (TA) and surprisingly into Israel (4X), around 3,600km distant!

According to Zeky, 9A5ST (Croatia JN83) conditions towards the UK were excellent between 1752-1850UTC when he contacted the stations of G1KAW/P (JO00), G4HGI (IO83), G4KIY (IO92), G4KWQ (IO92), G4MKF (IO91), G4PBP (IO82), G4REP (IO91), G4RUW (IO91), G4SHF (IO92), G6HKS (IO92), G8HGN (JO01), G8JVM (IO82), G8TIC (IO82), G0CUZ (IO82), G0GMB (IO92), G0HVQ (IO81), G0LGS (IO81), G6HKS (IO92), M5BFL (IO91), 2E0UAC (IO92), 2E0UOG (IO83), GW7SMV (IO81) and GW8JLY (IO81).

Kev Piper, G0CHE (West Sussex, IO90) reports that he worked the stations of E730 (JN95), YU1EV (KN04) 9A1CRS, 9A5CY (JN85) and also heard LZ3RX. He was particularly pleased to make these contacts as he only runs 50W into a Comet GP15 vertical antenna.

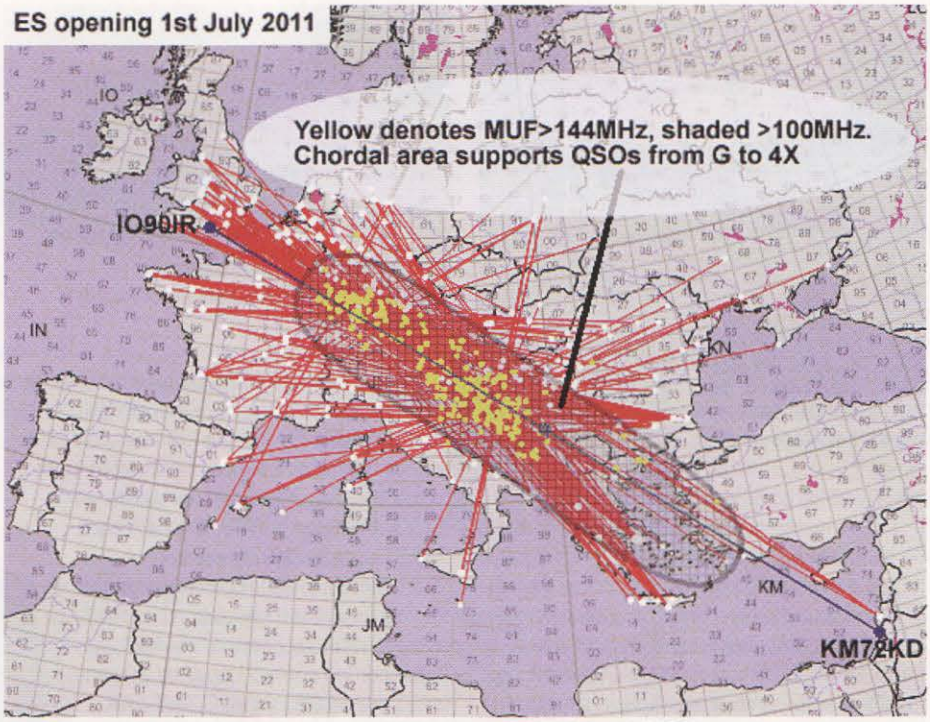


FIGURE 1: The 144MHz opening between the stations of G7RAU and 4X1GA.

Ian Goodier, G0UWK (Staffordshire, IO83) mentions that he was enjoying a BBQ at home when he received a telephone call from a local radio amateur, 2E1INY, who informed him that he was copying SV1OAA on an indoor dipole! Rushing up to the shack, Ian found the Greek station calling CQ on 144.290MHz with no-one replying. The amplifier takes 3 minutes to warm up so he called barefoot with just 10W and a contact was made, at a distance of 2,612km. Moving up the band to 144.315MHz and with the amplifier on, Ian then made contact with SW1KWG (KM18), some 2,597km distant. He comments that it is rare to hear Greek stations at his QTH and in 8 years he has only ever worked one such station, SV8CS, via Es propagation. His system, apart from the Yaesu FT-2000 transceiver, is all home-made, consisting of a 28/144MHz transverter, GS31b linear amplifier and a 10-element BVO Yagi.

Darrell Moody, G0HVQ (Gloucestershire, IO81), running an Icom IC-7400 transceiver, 100W and a 9-element Vargarda Yagi, made SSB contacts with 9A2BW, 9A5ST, 9A6R, E73LM, I7IWN/7 at 2,049km and SV1OAA at 2,559km distant. That was the first time in 30 years that Darrell has heard an SV station on the 144MHz band.

Other operators reporting new DXCC contacts on the 2m band included David Storrs, G8GXP (West Yorkshire, IO93) who worked SV9CVY (Crete, KM25) at 2,923km distant and Jonathan Constable, M5FUN (East Sussex, JO00) who made it to the station of SV1EN (Greece, KM18) some 2,338km away. Located in Athens, Greece, Yiannis Giannarak, SW1MNE mentions that he worked the UK stations of G4AEP (IO91), G4SWX (JO02), G4PBP (IO82) and G4UWK (IO93) whilst running only 5W from an FT-817 transceiver.

Working Greece, Crete and the Dodecanese Islands on the 144MHz band is undeniably very exciting but just imagine working even further distances into the Middle East. Dave Edwards, G7RAU (Isle of Wight, IO90) reports that he had just come back from a school fête, walked into the shack at 1800UTC, turned on the radio and heard three, yes three, Israeli stations calling CQ! The first station heard on 144.300MHz was 4X1ZQ (KM72) but unfortunately there was tremendous QRM from other SSB stations all calling CQ at the same time. The station of 4X1ZQ, some 3,603km distant, was only running 10W into a vertical antenna! Dave also heard 4Z5LY (KM72) calling CQ on 144.303MHz at 3,561km but again with intense interference that drowned out any possibility of a contact. Then the CW station of 4X1GA (KM72) was heard on 144.300MHz at a distance of 3,600km. Dave mentions that he doesn't like using CW on the SSB calling frequency but there are times when moving away is not an option. Despite the incessant calling from SSB stations the two-way CW contact was achieved at 1805UTC with signals varying from S9 right down to the noise level. Just for the record the 144MHz system at the station of G7RAU consists of an FT-757 transceiver, 400W amplifier and a 12-element Yagi (**Photo 1**). After that remarkable contact with Israel was completed G7RAU then went on to make SSB contacts with E730, S59GS, 3 x LZ, 6 x YU and 10 x 9A stations.

Arcady Grabois, 4X1GA (Israel, KM72) mentions that he first became licensed as UO50BT in 1987, then relocated to Israel,

PHOTO 2: The 'field-day' style balcony shack at the QTH of Arcady Grabois, 4X1GA.

initially obtaining the callsign 4Z5DB and in 1999 upgrading to the extra-class licence 4X1GA. In April 2011, Arcady and his family rented an apartment on the 8th floor of a block of flats near to Tel Aviv. Because of this situation he has to operate field-day style with a dual-band 144/432MHz 5-element Cushcraft Yagi fixed to a self-standing aluminium support located on the balcony (**Photo 2**). The station consists of either a Kenwood TS-2000X or Yaesu FT-897D transceiver and laptop computer, assembled daily on a nearby table. Two solid-state Mirage amplifiers, one for VHF (180W) and one for UHF (110W) are also available if conditions seem enhanced.

During the evening of 1 July the equipment in use consisted of the FT-897D (the final amplifier improved with an RD70MVS1 MOSFET) running about 60W output power into the small 5-element beam. The radio was tuned to 144.300MHz and at 1730UTC he heard a local station 4X1ZQ calling for DX contacts. Monitoring the frequency more carefully, Arcady heard YU1EV calling CQ and a quick SSB contact was achieved over a 1,876km path, followed by a contact with LZ2DP some 1,405km away. Around 1800UTC 4X1GA switched over to CW, calling CQ on 144.300MHz and was answered by the station of G7RAU. At first the signals were quite weak peaking 539 and he incorrectly received the call as GW7AU. Within seconds though the CW signals came up to 579 and reports, locators and RRRs were exchanged. It was all over within a minute, an incredible 3,600km contact! Arcady mentioned that he finished his pint of beer, raised his glass and exclaimed 'God bless England'.

"'Superb' is the only thing I can think of" remarked Jamie, GW7SMV (Gwent, IO81) who heard a 4X-station, presumably 4X1ZQ, at a distance of 3,766km and 4Z5LY at 3,723km. Using an Icom IC-910H, 400W and a 12-element M2 Yagi he also worked two new DXCC when he contacted SV2JL (Greece) and SV5BYR/5 (Dodecanese), these contacts being particularly pleasing as SV has never been heard before at his QTH in 17 years.

Lyndon Leach, GW8JLY (Glamorgan, IO81) was amazed to hear a very weak 4X

PHOTO 3: The 144MHz station of Arcady Grabois, 4X1GA.

station on 144.300MHz, quite exciting as the distance is around 3,760km. Surprisingly he didn't hear any SV stations although GW7SMV, who is only 15km away, managed to work two of them. Lyndon did manage to work E730, YU1EV, YU7PAA, 9A2WA and 9A5ST by way of compensation.

Incidentally, although very rare, this is not the first time that a UK station has made an Es contact into Israel on the 144MHz band. The first recorded contact occurred 30 years ago on 11 June 1981 when G3VYF (JO01) made an SSB contact with 4X4IX (KM72) over a path of 3,515km. The next opening (and I cannot find reports of any more since then) took place 13 years ago on 3 June 1998 when G4FUF (JO01) contacted 4X4MO (KM72) at 3,500km and 4Z5BS (KM71) over a 3,590km path.

At the time when these contacts were reported in 1998 Geoff Grayer, G3NAQ surmised that the propagation to the Middle East was via a double E-layer refraction with a chordal-hop between the two reflection points. He supported this theory as the distance involved is not correct for conventional two-hop Es. Chordal hops are shorter than those involving a ground reflection and they allow propagation above the normal maximum usable frequency (MUF). Geoff mentioned that he didn't hear any single-hop contacts being made to highly populated areas in northern Italy where one would expect the intermediate ground reflection point to be.

Dave, G7RAU also prefers the chordal-hop theory and he has produced a diagram (**Figure 1**) that depicts his 3,600km contact with 4X1GA. He suggests that events such as this seem to be related to a high MUF spread over a much larger geographical area than the traditional Es opening. Recent 3,000km openings to the Canary Islands (EA8) and Russia (UA) seem to fit in with a mini chordal-hop over a high MUF region rather than the alternative tropo link extension theory. Last year Dave heard the station of RA6HHT (Russia, LN04) at 3,400km distant and in this instance the area of high MUF was considerable and located in the correct position.

DEADLINES. Next month I'll hopefully catch up with your 70MHz and 144MHz reports as long as there is not another huge opening! Good luck and if you do hear or work any DX stations on the VHF or UHF bands or have any other news then please send your reports to g4asr@btinternet.com to reach me before the end of each month. Alternatively you can send letters to Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP.

Book review

It's *Yearbook* time again!

RSGB Yearbook 2012

Edited by Steve White, G3ZVW

Updated and revised throughout, *the RSGB Yearbook* is the central reference for amateur radio.

Most people are amazed when they read the *Yearbook* for the first time; few have any idea of the sheer breadth of information that it contains. The RSGB provides a wide range of services for its members through a small staff at Bedford and a country-wide force of skilled, dedicated and knowledgeable volunteers. One of the major roles of the *Yearbook* is to provide a consolidated guide to all these services and, most importantly, give the contact points so that you can access them most easily.

There are seven main sections to the *Yearbook*, which group the information together in logical sense. The first of these concerns the RSGB itself. It includes details of Abbey Court, GB4FUN, GB2RS, how to use the QSL bureau, planning advice, Morse broadcasts and much more. Did you know, for instance, that the RSGB now maintains a lively technical form, RSGBtech, as a Yahoo Group? It's your first port of call for technical queries – and full details are in the *Yearbook*. Another very useful part of the RSGB section lists all the equipment reviews that have appeared in *RadCom* since January 1990.

Clubs are the lifeblood of amateur radio. Many national and local clubs are affiliated to the RSGB, which brings a wealth of benefits including discounts on book purchases and automatic third party liability insurance for club events such a field days. Many are featured in the *Yearbook* with a short write-up on their recent or planned activities; many more are featured on the CD that accompanies the *Yearbook* (of which, more later).

It is always useful to know where to turn for local help and the next section, Local Information, explains the RSGB's structure and representation via Regional Managers and Deputy Regional Managers. There is also a list, by Region, of clubs, emergency comms groups, plus where to find training courses, amateur radio exams and even where to get EMC help.

2012 is going to be a very full year for Britain and a Very Special Events section outlines plans for amateur radio's celebrations of Her Majesty The Queen's Diamond Jubilee in June and the Olympics and Paralympics in July-August.

And yet... all this only brings us to less than half-way through the non-callsign content! The remainder of the information section includes, among other things, comprehensive repeater and beacon data, features on contests, ARDF, datacomms, locators, microwaves, IOTA, a large section on EMC and even information on operating abroad.

Then, of course, there is the comprehensive list of all UK and Republic of Ireland callsign information. This has been substantially revised and updated with the latest information from Ofcom. The biggest change is the way it now treats 'details withheld' callsigns. These have now been removed from the main listing and consolidated into a single section. The advantage is that these callsigns now take up much less space, leading to a noticeably slimmer, easier-to-handle volume – despite listing nearly 70,000 callsigns.

But that's not all! Accompanying the *Yearbook* is a free CD that includes the full text of the Information section in fully-searchable PDF format, a greatly-expanded version of the Featured Clubs section of the *Yearbook*, over 30 pieces of software of interest to amateurs and sample chapters from a number of RSGB books. There is over 600MB of information in all!

The *RSGB Yearbook 2012* is the book that no discerning radio amateur should be without.

ISBN 9781-9050-8673-3
210 x 297mm, 576 pages
Non Members' Price £19.99
Members' Price £16.99

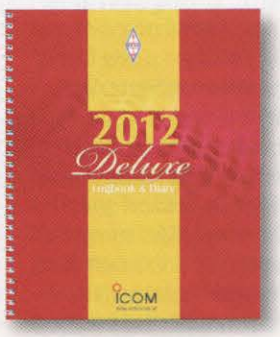
Callseeker Plus 2012 CD

Callseeker Plus is a fantastic resource that contains comprehensive callsign listings for the UK, Republic of Ireland and 18 other European countries. It is very easy to use and requires no installation or disk space – the software runs straight from the CD. Navigating results is quick and easy and you can output results in a variety of formats, including address labels.

The CD also contains a large bonus selection of amateur radio related software – over 30 packages, many of which have several features such as new operating modes or facilities. Best of all, it also includes the full Information section of the *RSGB Yearbook 2012*!

CD format
Non Members' Price £15.99
Members' Price £13.59

Deluxe Logbook & Diary 2012



What lies flat on your desk, contains a wealth of information, lets you log your contacts and will never let you down with a flat battery? No, not a laptop – the *RSGB Deluxe Logbook & Diary 2012*! Featuring its celebrated lay-flat spiral binding, this easy to use book contains a wealth of carefully selected essential operating and reference information. This includes band plans, a full prefix list (with a handy tick-when-you've-worked-them band grid), QSL Bureau information and much, much more. The log section comprises around half the book; there's plenty of space to record your important QSOs. Canny members will also be delighted to note that the Deluxe Logbook is the same price as the standard logbook, yet it contains so much more information.

210 x 255mm, 80 pages
Non Members' Price £4.99
Members' Price £4.24

GHz Bands

Some microwave news from outside the UK

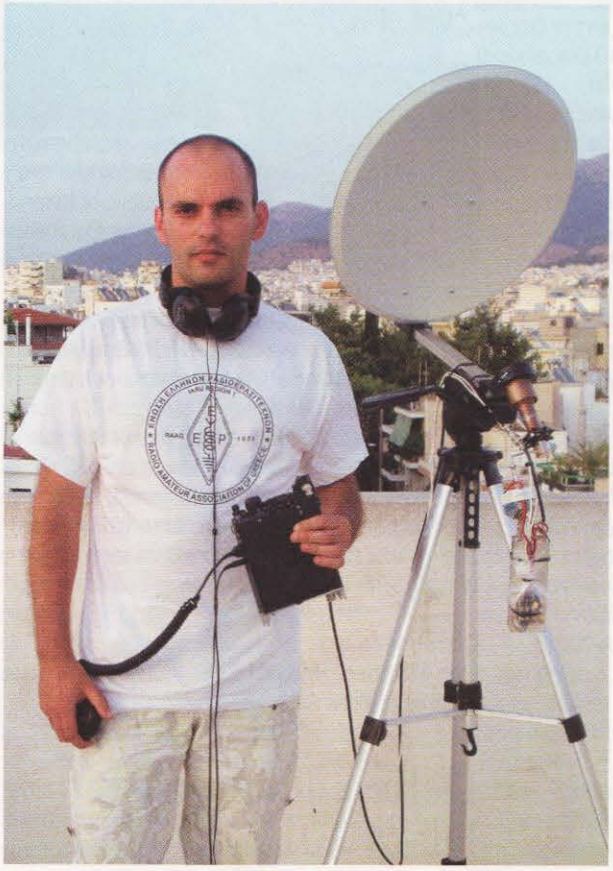


PHOTO 1: George, SV8GXC working SY9VHF on 10GHz from mainland Greece.

PHOTO 2: SV1BJY working SV8GXC/1 for the first SV1-SV9 10GHz QSO.

CONDITIONS. Early summer in the UK has been rather damp with the dry spring now being balanced by above-normal summer rainfall. Microwave activity levels have been moderate, but mainly confined to contest periods such as the Tuesday UKAC contests. Although rainfall has been up and much of this has been due to thunderstorm activity, there have been few storm super-cells in evidence and hence not a great deal of long distance rain scatter propagation, unlike in previous years. There have been no big lifts for several months. Indeed, a succession of low pressure systems from the Atlantic have contributed to much of the rain.

Rain scatter (RS) on 10GHz has been in evidence, although the lower altitude of the rain has tended to limit ranges to a few hundred km. 10GHz beacons GB3SEE and GB3CAM have both been heard here by RS.

The North Sea super refraction season has continued, but with just a few beacons audible here in East Anglia. G3LQR has consistently been copying the PI7RTD (Rotterdam) 10GHz beacon during late June and into July.

I think many microwave operators will now be looking forward to the prospect of those big autumn tropospheric high pressure systems and lots of DX on the higher bands.

ACTIVITY OUTSIDE THE UK. Time to take a look at some activity outside the UK. First a report from Lloyd, NE8I, who lives in Michigan in the USA and sends a report on his recent rover activities around the Great Lakes.

Lloyd reports that from near Lake Michigan (EN74at), at 450ft (140m) or so above lake level, he can normally see the lake. But on 15 June dense to heavy fog obscured the view. There was not much wind. Visibility varied from 3 miles maximum to under 300ft (91m) and, at times, he could not see the top of the 200ft (61m) cell tower across the road.

From the weather charts, he determined that winds from the SW were pushing the fog up the lake and over the top of the dunes. He could see the changes in density and layers of the fog. Inland, the fog formed low clouds. The lake temperature was about 50-odd degrees Fahrenheit (~10°C) with air temperature about 70°F (21°C). Cold Lake Michigan, warm wet air.

Lloyd tried to work Ron, W9ZIH, across the lake on 1296MHz. He could not hear Ron's 300W. They had the same results the last couple of tries during fog. Don, WW8M, could hear Ron, across the Lake, off the side of his array. When Lloyd aimed inland at Don, he could hear his 18W at S1. This seemed to indicate that the south end of the Lake was giving better conditions.

Lloyd comments that during fog, don't expect much in the way of microwave propagation. He has to travel some distance down the Lake in order to find microwave propagation across towards the Chicago side. He also comments that when there is fog but you can see blue sky straight up, signals on 24GHz are often stronger than 10GHz, and 47GHz was stronger than 24GHz.

My thanks to Lloyd for his report. It is good to hear what is happening on the other side of the Atlantic. If any other USA microwavers are reading this, please send me any microwave reports to the address at the top of this page.

There is a lot of amateur microwave activity in the Michigan area if [1] is anything to go by. [2] shows some of the portable locations around the Great Lakes area.

FIRST 10GHz CONTACT BETWEEN SV1 AND SV9. The first 10GHz QSO between mainland Greece and Crete took place on 4 July at 1800UTC between George, SV8GXC/1

FORTHCOMING MICROWAVE EVENTS 2011/2012

Weinheim, 10-11 September. Details at www.ukw-tagung.de.

Crawley Microwave Round Table, 11 September. No details available at present.

RSGB Convention, 7, 8, 9 October, Horwood House, Milton Keynes. Details at www.rsgb.org/rsgbconvention.

Microwave Update, 13-16 October, Enfield, Connecticut, USA. Details from Bruce Wood, N2LIV, n2liv@arrl.net.

Scottish Microwave Round Table, 5 November, The Museum of Communications, Burntisland, Fife, KY3 9AA. Details at www.rayjames.biz/microwavert.

15th International EME Conference, 16-19 August 2012, Cambridge, UK. Details at www.eme2012.com.

PHOTO 3: Mansueto, 9H1GB's portable 10GHz system set up in the back of his vehicle.

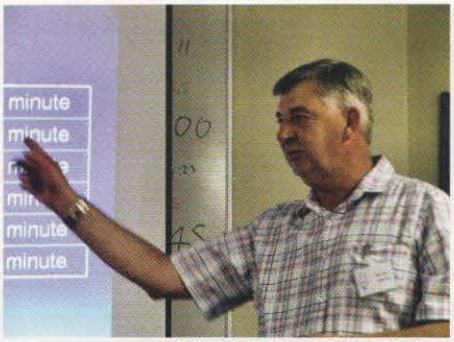


PHOTO 4: Ray, GM4CXM, talking on the subject of aircraft reflection at the Finningley Microwave Round Table.

(KM17) and Yiannis, SV1BJY, operating as SY9VHF (KM15) from SV9 (Crete Regions).

The equipment on both sides was homebrew. SV8GXC used a DB6NT design transverter with 45cm offset dish and SV1BJY used a KH6CP design transverter with a 90cm prime focus parabolic. According to George, seen in **Photo 1**, the 288km QSO was achieved with reduced transmitting power levels. SV1BJY (**Photo 2**) used 30mW and that gave good signals while the 10mW from SV8GXC peaked 56 in SSB and 59+ in FM.

The microwave collaboration between George and Yiannis goes back to 2008 when they started radio experiments. On 2 March 2010 they achieved the first QSOs on the 10 & 24GHz bands within Greece, using WBFM. George comments that amateur microwave operation in Greece is strictly limited. After 30+ years of the SV Band Plan being in existence, many of the most popular microwave bands remain as secondary allocations (and completely closed in practice) because the Ministry of Communications does not give NOV permits. The only amateur band that was opened from secondary basis, through NOVs, was 10GHz in March 2010 after negotiations by the Radio Amateur Association of Greece. The 3.4GHz band doesn't even exist while 5.6, 47 and 76GHz remain closed to ham operation.

Both SV8GXC and SV1BJY continue to work on improvements to their stations and they hope in the future to achieve contacts outside Greece.

CRETE TO MALTA. From Mansueto, 9H1GB, on Malta we hear that there is activity on the microwave bands from this historic Mediterranean island **[3]**. During the June DXpedition to Crete by Yiannis, SV1BJY, an attempt was made to work from Crete to Malta. They were audible in Malta (JM75) from KM15 on 144, 432 and 1296MHz, resulting in a first between 9H1GB and SY9VHF on 23cm. This was immediately followed by a contact between Joe, 9H1VW and SY9VHF. Tests on 10GHz were unsuccessful although signals were heard briefly from SY9VHF.

Manseuto was using a homemade 118mW 10GHz system with a 45cm dish. Joe used a 10GHz transverter and 1W amplifier by Kuhne Electronics (DB6NT) with a 50cm dish. Mansueto plans to upgrade his system and try again in the future. Mansueto's 10GHz portable system can be seen in **Photo 3**.

Mansueto mentions he was contacted by a group on Sicily (IT9) who informed him that they would be active for a forthcoming contest on 144, 432, 1296MHz and 10GHz. He says, "This is also very good news for 9H as, although there are about 4 stations active on microwaves, there is hardly any activity by our neighbours and finally, after years and years, activity seems to be on the rise".

You can see some of Mansueto's and SY9VHF activities for yourself on YouTube **[4]**.

Thank you for the report Mansueto. I wonder how you got on with the IT9 station in the contest?

FINNINGLEY MICROWAVE ROUND TABLE. Each year the Finningley Amateur Radio Society **[5]** hosts a microwave round table (RT) at their Hurst Communications Centre in Sandtoft, North Lincolnshire. This is a two day affair and this year was held on 9 and 10 July. There were 46 pre-registered names on the attendance list, but I know that there were several more who hadn't managed to register beforehand.

The packed programme included, on the Saturday, a beginners' workshop that included practical demonstrations around the Hurst Centre, a talk on second-user microwave power meters and power meter accuracy by Bryan Harber, G8DKK; two talks on lightwave communications – the first by G0EWN and G8AGN, followed by G8CYW. This was followed by a demonstration of lightwave communications around the club grounds.

On the Sunday the programme continued with Bernie, G4HJW, talking about the frequency reference to be used with the Finningley 10GHz beacon G0GHK/B, which will shortly become GB3FNY. This was followed by Andy, G4JNT, talking about PICs in amateur radio **[6]**, together with a demonstration on PICs in the workshop.

For many of us the talk on aircraft reflection (AR) propagation by Ray, GM4CXM, was eagerly awaited and didn't disappoint. This really is a fast-maturing technique that allows some otherwise 'impossible' contacts to be made on the higher bands, such as 23 and 13cm. Ray is seen in **Photo 4** explaining some of the finer points of AR.

Kevin, G3AAF, talked on surface mount construction techniques, in which he demonstrated several useful tools for holding down SMD parts ready for the soldering operation.

During the two days of the RT there were a number of useful workshop activities including noise figure measurements, conducted by G8FEK and an antenna test range for 1.3 to 47GHz run by David, G6GXK. Bernie, G4HJW, ran a 3cm converter building workshop where a number of his now well-known 'Bernie box' converters were assembled.

Throughout the event there were plenty of surplus goodies available to browse and purchase. The highlight for me was the surplus 3G power amplifiers capable of over 200W output on 2320MHz and on sale for as little as £30. Easily converted from 2140MHz to 2320MHz, with lots of conversion information available, these should give a big boost to any 13cm station. I bought one to convert and hope to report back on the results in a future column.

Together with the Saturday evening dinner at the nearby Reindeer public house, camping facilities on the club grounds for those wanting to brave the elements and good food in the club house, this has to be one of the best UK Microwave Round Tables to attend both for established microwavers and those thinking about having a go at something different.

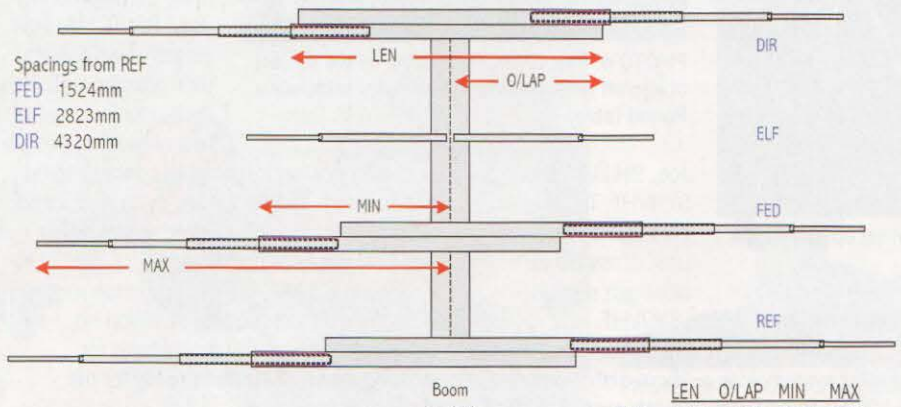
My thanks go to the Finningley Radio Society for organising yet another excellent event. At the time of writing we have the RAL, Crawley and Scottish Microwave Round Tables to look forward to.

WEBSEARCH

[1] Michigan amateur radio – www.oocities.org/wb8tgy/stations.html
[2] Great Lakes area radio amateurs – www.oocities.org/wb8tgy/sites.html
[3] Malta – www.9h1mrl.org/10ghz.htm
[4] 9H1GB Youtube – www.youtube.com/user/9h1gb
[5] Finningley Amateur Radio Society – www.g0ghk.co.uk/
[6] G4JNT talk – www.g4jnt.com/Publications.htm
[7] VK6WG – www.vk6uu.id.au/VK6WG.html

PICaYAGI

Part 3: the mechanics



	LEN	O/LAP	MIN	MAX
DIR	4140	2020	2120	5218
FED	4000	1455	2545	5503
REF	4300	1660	2640	5898

FIGURE 9: PICaYAGI main element lengths - viewed from above.

OVERVIEW. This part describes the mechanical construction. **Figure 9** gives a perspective on the lengths and spacings and **Figure 10** shows a half element in more detail, emphasising the wall thicknesses, diameters and the dielectric coupling. The four tubes are lettered for reference. The table in Figure 9 defines the differences between the three elements, ie the length (LEN) and overlap (O/LAP) of the fixed tube D. Figure 10 defines the length of tube B by element. MIN and MAX follow by arithmetic.

MODULAR CONSTRUCTION. For the boom, I used 3 x 1500mm lengths of 17/8" OD tube with 16 SWG wall. Two of the lengths are swaged, which gives a net length of 4360mm - and plenty of rigidity with one exhaust clamp per joint. I bought this tube as a 'seconds' mast set. The 44.37mm ID is *just* enough to accommodate the screwdriver. But were I doing it again, I would buy 5000mm of 2" OD x 16 SWG and use some 21/4" OD x 16 SWG with exhaust clamps to externally sleeve the boom joints and the stub mast attachment point. See **Figure 11** for both strategies — and a summary of the drive train wiring that penetrates the boom.

The virtue of this modular approach is that each element can be built and tested in turn – and separated in the event of any problem. This is important in practice because although one such module might go in your garage (but for the other stuff), three joined together almost certainly won't.

All my elements are secured to the top of the boom with standard TV boom/mast clamps.

CONSTRUCTION SUMMARY. The basic sequence is as follows:

- Build 6 identical half-elements
- Assemble them into 3 pairs
- Attach them to their boom as REF, FED, DIR
- Build the 3 identical screwdriver assemblies
- Integrate them with their boom/element modules and add the braid drive cords
- Test each element for IN/OUT functionality
- Integrate the 3 boom/element modules
- Add the linear resonators and matching system
- Add the ELF
- Add the Controller - and you have your PICaYAGI.

Ah yes, not forgetting the software – this adds much to the functionality but little to the weight!

TUBE STOCK. This design makes efficient use of 4m or 5m standard length round tube stock. It is just capable of spanning 14.00-29.40MHz. At the time of writing, no one supplier in the UK stocks all the aluminium needed at a plausible price. There is a *huge* (eg 2:1 variation) in delivered aluminium tube prices available over the internet. However the supplier I used two years ago **[1]** is still easily the best bet in the UK as of early 2011 – though unfortunately they don't stock quite everything you need. I note that they now sell some tube in 5m lengths, which gives more frequency span.

The structural element tubing, ie all but the tips, should be heat treated to 6063T6 or similar.

UNITS. I need to make an early apology for mixing dimensional units. In the 84 years since Yagi and Uda we have had 'standardisation' – as a result of which, most suppliers in the UK now sell aluminium tube in metric lengths with SWG wall thicknesses and Imperial diameters. Amazing! For purchasing consistency, I have elected to use these units – though they are certainly not the easiest to work with if you need to adapt for either pure metric or USA standard sizes.

ALUMINIUM SHOPPING LIST. Starting at the element tips and using the references in Figure 10:

A 9 off, 6mm OD x 4mm ID x 1000mm. From various web suppliers – but also sold in 1m lengths by most UK DIY shops. You need 8 x 1m element tips and ~1m for the matching unit.

B 6 off, 3/8" x 16 SWG x 5000mm (OD 9.525, ID 6.273mm). You need one per half element. The offcuts are used for screwdriver coupling, linear resonators, the ELF and the matching unit.

C 3 off, 1/2" x 18 SWG x 4000mm (OD 12.70, ID 10.26mm). 3 off – cut into 2 – gives 6 x 2000mm.

D 6 off, 3/4" x 16 SWG x 5000mm (OD 19.05, ID 15.80mm). You need one length (= LEN) per half element.

To complete the aluminium order you also need 1 off, 6mm dia rod x approx 1000mm, 1 off, flat bar 20 x 3 x approx 2000mm, 1 off, square tube 7 x 7 internal x 1000mm. You will also require a boom of your choice, see Figure 11.

As of January 2011, shopping carefully and only from UK sources, the above came to about £160 including shipping and VAT.

BUILDING THE SLIDING TUBES. The initial task is to build 6 identical sliding inner tubes using as-supplied tube B length and no tips. It takes about 3 days - including glue and epoxy setting times. The process is the result of much trial and much error and re-work – and required several builds to optimise it. I'm convinced that the process is completely repeatable – mostly because I repeated it myself twelve times. Both the detail and the exact build sequence are important. If you are using the same tube sizes then I commend it to you. If different, then I commend the principles and construction tips. The detailed process is on the project website **[2]** and the result is shown in **Figure 12**. Some comments about the ingredients:

Aluminium foil. The kitchen foil used here is from Lakeland™. It is very high quality, ie soft, malleable, thick and, critically, unembossed. It comes in 45cm and 50cm widths. I preferred 45cm. 50cm is useable but more difficult to handle.

Heatshrink. I used Rapid Electronics' 03-1125 that comes in 1.2m lengths. It has a K of 2.5, a 3:1 shrink ratio and 0.85mm nominal shrunk wall thickness. You need 6 off (plus some spares).

The remainder of the sliding tube is also shrouded in heatshrink to ensure it never touches the inboard tube at *any* extension. I used Rapid Electronics' 03-0346, which is specified as 12.7mm but just fits over the 12.7mm OD tube with a little silicone grease and lots of elbow grease. It also shrinks onto the 6mm tube tips. Fit this heatshrink before attaching the braid.

For shrinking, I used a hot-air paint stripping gun. This is somewhat excessive but is fine so long as you stay well back from the heatshrink and keep it on the move. It is also perfect for lighting real BBQs. If you need to buy something, I commend this as very much cheaper and more versatile than the official tool.

Silicone grease. You need to apply this liberally to all the rubbing surfaces, eg the outside of the heatshrink and the inside of the boom.

Nylon screws. These are cheese-head crews. You need both M3 and M4. I used stainless steel nuts where required. My thanks to Ray, G4TZR for the idea for these as bearings. I can see absolutely no evidence of wear after 2 years of hard use.

Twin pack epoxy resin. This is used to locate the nylon screws. It does not bond effectively to nylon but it does capture the thread and locate the head. Cleanliness is everything.

Pop rivets. These are countersunk type and 3mm diameter. You need about 40 of them in total. Keep the shanks for pinning the drive chain.

Penetrox™. This is an aluminium loaded grease by Burndy. It is used throughout this project on each and every metal-to-metal mating surface.

Braid. After much trial and error, I settled on Moss Green Fireline braid from Berkley. You need 80lb (36.3kg) breaking strain. A 300yd reel (way too much) costs about £28. I used cheaper 1mm Kevlar for the anti-droop braid, for which either will do fine.

INTEGRATING THE PAIRS.

Measure the capacitance between the 6 fixed and sliding tubes to give 3 closest match pairs. The pair with the most capacitance should be assigned to the FED, followed by REF and then DIR in that order. The tubes can now be cut to length and the tips fitted.

Next, some GRP fabrication. This is based on the glassfibre tube 25.4 OD x 19.4 ID x 1000mm mentioned in Part 2. This material is not pleasant to machine. Wear a mask and gloves and work outside if possible. It is used for three purposes:

- Tips for the inboard tubes
- Centre insulator for each main element
- Centre insulator for the ELF, discussed later.

GRP tips. There are 2 per element, bonded to the outer ends of the fixed inboard tubes (see **Figure 13**). These tips have three purposes:

1) to locate two M4 nylon screws that act as a support for the sliding tube,
2) to retain the anti-droop braid ends and
3) to retain some 5mm stainless steel bar as a captive roller, which is used to reverse the braid direction.

Cut 6 lengths of GRP tube 60mm long. For the OUT-braid tip, the roller goes on the bottom but for the INTER-braid tip it goes on the side. The alternative positions are illustrated in Figure 13 – but this is only determined when the nylon screws and tips are actually fitted.

Hacksaw and file a tapered slot to capture the roller in the thickness of the GRP wall - just protruding into the ID of the GRP tube. Then file a further notch to pass the braid.

Main element centre insulators. First, you need to cut along the length of the GRP tube with a hacksaw, tangential to the ID as in **Figure 14**. When finished, you need 7 lengths each about 150mm long.

The best way I could find of doing this by eye is to start the cut and then use this to draw two parallel lines on the outside to act as cutting guides. When you have the 7 lengths, set aside 1 for the ELF centre insulator and pair up the others. Each pair forms a central shroud over the middle of a main element to insulate it from the boom — and to prevent the boom to element clamp from crushing the element.

Photo 10 shows the finished result. Using two tubes as templates, apply some polish to the aluminium to act as an epoxy resist, slide on the 2 halves, clamp it all in a vice and stick the 2 halves together with a minimum of epoxy resin.

When this has cured, check that it releases before applying layers of GRP mat and resin to integrate the two halves. At the same time, you need to integrate a vertical rod to hold up the centre of an anti-droop bracing cord.

I used 15mm hardwood dowel about 350mm long with a V-notch to retain the braid. Wrap the dowel with a layer of mat and then resin and, when it has part-cured, bond it in the middle of the tubes. Then strengthen the joint with more GRP, tapering it off over the first few cm of the dowel. This process is best completed with the boom to element clamp in place, laminating around it.

Grease the inside of the GRP and insert the tubes, adjusting the overlap. Clamp them together with stainless steel hose clips, 6 per element, with 1 hose clip each side of the GRP to prevent the tubes from pulling through. Then fit the GRP tips and their nylon screws, rubbing down their heads to wedge-shaped along the direction of element movement – and just proud of the ID of tube D.

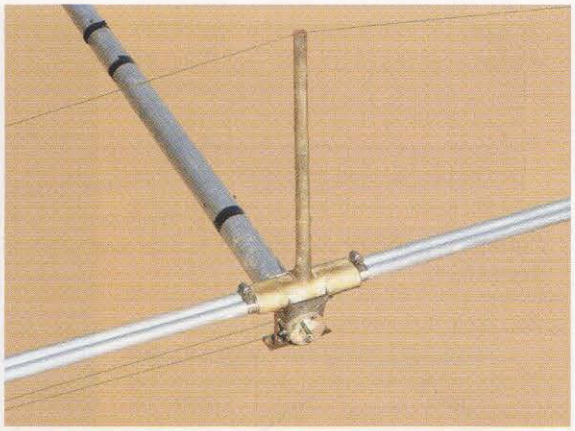


PHOTO 10: Showing a central insulator with its vertical support for the anti-droop braid.

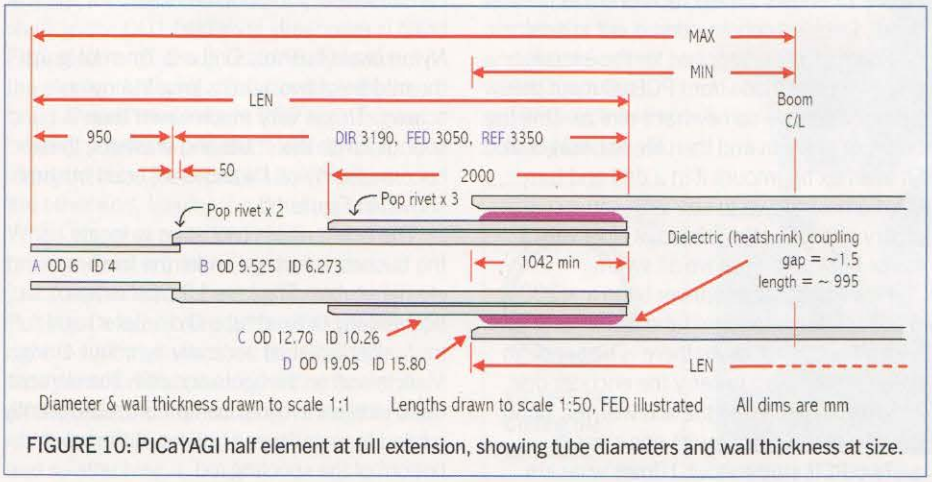


FIGURE 10: PICaYAGI half element at full extension, showing tube diameters and wall thickness at size.

MOVING THE ELEMENTS.

The FED, DIR and REF mechanisms are identical. **Figure 15** shows the scheme of things. There are 3 braids that all have their directions reversed near the ends of the fixed tubes. To expand the element, the OUT-braid is spooled onto the spooling rod and the left hand element

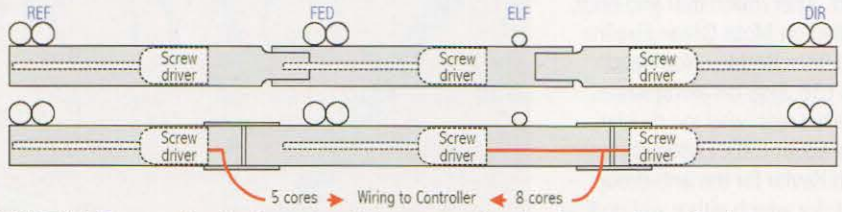


FIGURE 11: Boom and main element modular construction showing two alternative boom arrangements.

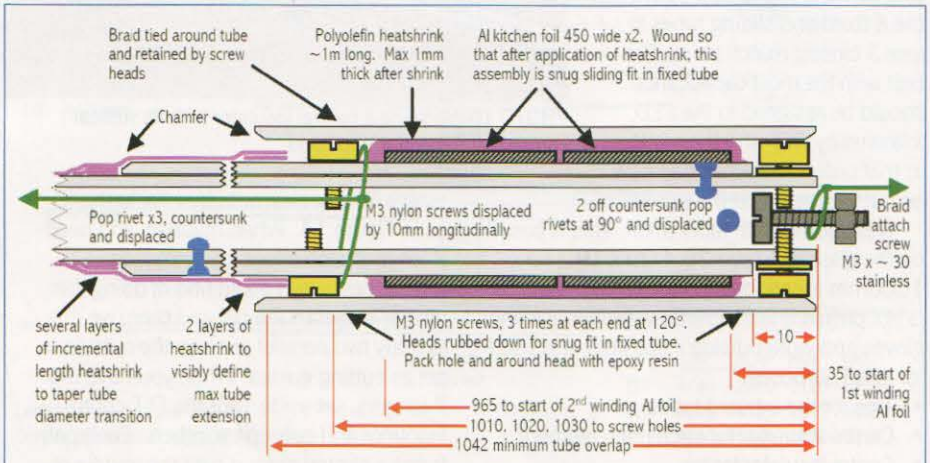


FIGURE 12: Details of assembly to form a dielectric-filled gap between fixed inboard and sliding tubes with minimal trapped air. Also shown are nylon bearings (M3 screws) to hold the sliding tube straight and true within the fixed tube. All dimensions are mm.

PHOTO 11: Braid tensioner made from a PVC pipe clip.

goes out. The INTER-braid transfers this out motion to the right hand element, which also moves out – and takes up the IN-braid slack as it is spooled off. And vice versa to retract.

The spooling rod is 6mm diameter, 18.85mm circumference. So to move the element by 3000mm requires about 160 turns. To avoid the braid piling up and altering the effective diameter, the spooling rod is driven longitudinally by an M6 thread. This has a 1mm pitch and so travels 160mm for 160 turns. The drive mechanism is shown in **Figure 16**. The essential feature is a sliding square drive. My thanks to Dave, G3SUL for the idea. It is implemented as a square PVC rod sliding in a square aluminium tube. That PVC rod and the two PVC circular bearings are cut from a self-healing kitchen chopping board - available from all good supermarkets. None of the lengths is critical; there's no problem if everything is a bit longer than theoretically required.

SCREWDRIVER ASSEMBLY.

This comprises a screwdriver motor and hex bit, a photo-interrupter IC, a few components and some PCB tracking. **Figure 17** shows the electrical and mechanical detail. Detailed construction is not critical.

Figure 18 is a template for the encoder disc, which is made from PCB. Cut out the 28mm dia circle somewhat oversize. Drill the hex hole at 6mm and then file to hexagonal. Fit to a hex bit, mount it in a drill and turn the diameter down to size with some coarse emery cloth. Cut the 32 radial slots with a junior hacksaw. Remove all swarf.

Fit a Phillips screwdriver bit to a ~200 x 6.27mm ID aluminium tube by banging it in with a hammer. Ensure there is just enough of the bit showing to carry the encoder disc *and* fully insert it into the screwdriver. Bond the disc to the hex bit with epoxy resin.

Two PCB strips about 10mm wide are bonded to the case of the screwdriver on opposite sides to locate it and to give an easy sliding fit in the boom. One of the PCB strips is scored (or etched) to provide three longitudinal tracks on which to mount the components and to interface the wiring back to the Controller.

Fabricate the PCB tracking. Then remove the battery pack, switches etc from the screwdriver and solder two generous 5A wire tails to the motor wiring. The recommended screwdriver is far from a round section, so trim off any surplus style bumps etc from the casing until a) it is a sliding fit inside the boom with the PCB strips and b) the motor axis is central in the boom.

Bond the screwdriver to the PCB with epoxy resin while sliding it into the boom with the bit and disc to check that the axis of the screwdriver is centred in – and parallel to – the boom.

Solder in all the components, adjusting the leads of the photo-interrupter so that the encoder disc sits centrally in its slot.

INTEGRATING DRIVE TRAIN, BRAID AND ELEMENT.

Starting with an element pair lightly clamped to its boom section and a completed screwdriver drive train, the task is to couple these up to the IN, OUT and INTER-braids, ending up with a fully working expandable element, as shown in Figure 15.

The first task is to learn to tie a 7-turn Grinner knot. It is a popular fishing knot that minimises the reduction in braid breaking strain inherent in tying any knot. There are countless descriptions on the web, though I suggest you avoid the videos and find a step by step illustrated sequence. Some say you should use cyanoacrylate glue to secure the knot. For this application you don't need it and, because it is a slip knot, you can loosen and remove it without undoing it.

Another early task is to pre-stretch some braid. Hang up a long length and load it to about half breaking strain. A bucket full of water and some house bricks is useful. Leave it at least overnight. But be very careful where you put it because this braid is essentially invisible.

Nylon braid bushes. Drill a 0.7mm hole up the middle of two 10mm long M4 nylon screws. This is very much easier than it sounds. With their nuts and washers, these become the nylon IN and OUT braid bushes shown in Figure 16.

The boom needs two holes to locate the bushes, which go under the fixed element tubes. They are 19.05mm apart horizontally (a fixed tube D diameter) and mutually displaced vertically by about 4mm. Mark this off on the boom and drill. The element – and element to boom clamp – are subsequently rotated to 'point' these bushes at the top and bottom of the spooling rod.

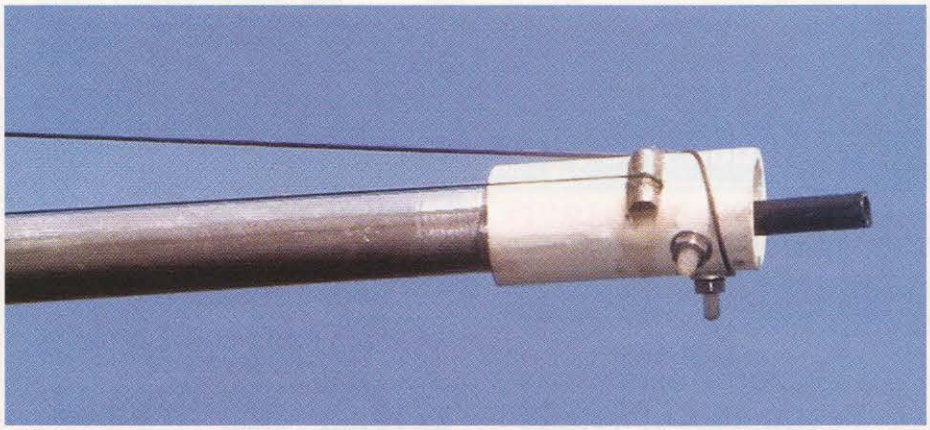


PHOTO 12: GRP element tip showing the two nylon screw bearings, anti-droop braid above – and INTER-braid with roller on the side.

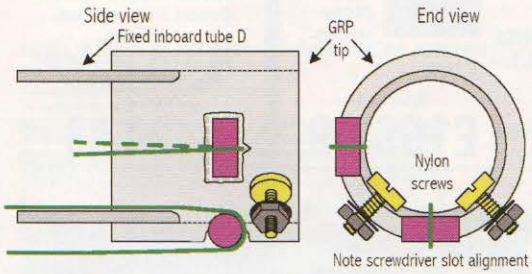


FIGURE 13: GRP tip showing both roller positions.

Braid tensioner. This is used to take up any slack in the IN-braid. It is made very simply from a standard PVC wall mounting pipe clip for 22mm central heating pipe. This is one of the rare but happy occasions where they package them in threes and that is what you want. It clips to the element tube – and a length of 5mm roller (same as the GRP element tips) fits into what is normally the hole for screwing the pipe clip to the wall. The body of the clip may need to have some protruding flanges shaved off so that a hose clip fits neatly around it and sits flat. See **Photo 11**.

Drill a 1m hole both sides of the roller hole and also remove the PVC behind the roller hole so that the braid will go in, round the roller and back out again. Fit the braid first, then the roller. Check that the braid runs freely and is not trapped. Then clip it to the boom and tighten the hose clip to secure it. At any time its position may be adjusted to take up any slack in the IN-braid and also modest slack in the OUT-braid.

Fitting the anti-droop braid. Fully retract the elements. Using a Grinner knot, tie the braid around the element GRP tip using the bearing screws to prevent it sliding back along the tube (see **Photo 12**). Repeat at the other end, leaving the braid just slack. When you now raise the middle of the braid and slot it into the V-notch it should just bow the fixed tubes slightly upwards. Putting it another way, getting the tension right is a bit trial and error. But you can easily shorten the braid by sliding one end off the tube and then looping it through a steel nut (a few times and/or through several nuts) and re-attaching it.

Locating the drive train. Drill the hole in the spooling rod for the IN-braid. Drill it 1mm and then, hand-holding a 2mm drill bit, soften the sharp edges on both sides. Repeat with a 3mm drill bit. Do not drill the OUT-braid attach holes at this stage.

Rotate the M6 nut on its hardwood disc until it is 10mm from the screwdriver end of the stud. Lay the drive assembly next to the boom and position it so that a) the IN-braid spooling hole is opposite the IN-braid bush hole in the boom and b) the sliding drive has 170mm of exposed PVC drive rod showing. The drive train is now in the fully OUT position, with some margin for error.

On the boom, lay off and mark the positions of the securing screws for the hardwood disc, the PVC bearing nearest the screwdriver and the screwdriver itself.

Select 6 short, sharp, tapered, self-tapping fully threaded wood screws. Drill holes in the boom at a diameter that will take the full diameter of the screw; 1 for the screwdriver, 2 for the PVC bearing on opposite sides of the boom and 3 for the hardwood disc, approximately equally spaced around the boom.

Secure some coarse emery to a broom stick and use it to remove any internal rough edges or swarf from all the holes inside the boom.

Lightly grease the end of the inside diameter of the boom and insert first the wiring, then the screwdriver into the boom. Now grease also the circumference of the PVC bearing, the hardwood disc, the M6 stud thread and the spooling rod.

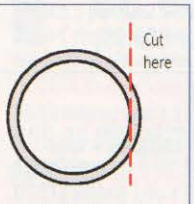


FIGURE 14: Cutting the GRP tube.

Insert the assembly by pushing on the spooling rod. A word of caution: never pull on the wiring or from the screwdriver end since you risk pulling the bit out of the bit-holder and smashing the shaft encoder disc.

As soon as the hardwood disc has passed the IN-braid bush hole, fit the bush, washer and nut and loosely tighten. Pull the spooling rod out a little, pass the end of the reel of braid through the bush, through the spooling rod IN-braid hole and fasten it to the coupling pin with a Grinner knot.

Continue pushing the assembly into the boom until the PVC bearing reaches its screw holes. (Once the screwdriver has cleared, put the shank of a pop rivet in the hole so you can see when the PVC first arrives.)

Fit the screw in the screwdriver casing but only 1 of 2 in the PVC bearing. Now pull the spooling rod back out until the hardwood disc lines up with its screw holes. Fit only 2 of those 3 screws at this stage.

Drill and self-tap the outer PVC bearing to take a couple of long large wood screws, but don't fit them. They can be fitted later to give something to pull on should you ever need to extract that bearing. Fit that outer PVC bearing, pushing on it until it reaches the IN-braid bush. This bearing also has the secondary use of helping to prevent crushing of the boom by the element clamp. Now fit the OUT-braid bush – again, loosely tightened.

Fitting the drive braids. Lay off the IN-braid length – via the braid tensioner – to the attachment screw position on the inner end of the fully extended right hand tube. Cut the braid length.

Push the end of the braid up through the hole of the OUT-braid roller on the left hand tube and then out of the tube end. Pull out the sliding tube until it is just more than fully extended and with the bushes showing. Using a Grinner knot, tie on the OUT-braid as per the left hand end of Figure 12. Then push the element all the way back in and a

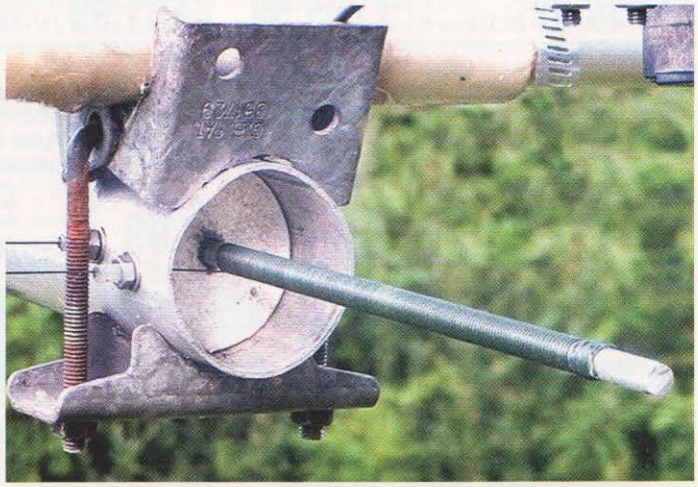


PHOTO 13: OUT-braid – spooled via braid bush.

SHOWROOM & MAIL ORDER:
Unit 1, Purfleet Industrial Estate, Off Juliette Way, Aveley RM15 4YA

★ WANTED: USED EQUIPMENT FOR CASH OR PART EXCHANGE ★

Haydon Communications

LOCAL TO GLOBAL

TEL: 01708 862524
FAX: 01708 868441

Mail Order & showroom open:
Mon-Thurs: 10.00am - 4.00pm
Friday: 10.00am - 3.00pm.
Our showroom is 5 mins from "Dartford River Crossing"
E&OE
(next day delivery available)

TO ORDER ON-LINE SEE www.haydon.info

To contact our sales dept.
E-mail:- admin_@haydon.info

PayPal SWITCH VISA

HF TRANCEIVERS

TEN-TEC EAGLE 599

£1730.00
With ATU fitted £1935.00

JUPITER 538B

£1539.00
With ATU fitted £1835.00
This model accepts standard keyboard

FT-2000D

FT-2000D (200W) £2579.99
FT-2000D + SP-2000.....£2725.99
MD-100A8 + FT-2000D.....2679.99

FT-2000

FT-2000 (100W HF + 6m)
£1975.99

FT-950
HF + 6m IF DSP

Superb "I.F." DSP Rx
OUR PRICE £1199.99

FT-897D
Includes DSP

OUR PRICE £759.99
OR FT-897 + MS-1228 £819.99

FT-857D DSP

HF + 6m + 2m + 70cm.
OUR PRICE £659.99
OR FT-857 + MS-1228 £719.99

NEW FT-450D

This is the latest IF DSP marvel from Yaesu. HF + 6m (500/300 CW filters as standard). New design + ATU.
THE DSP ON THIS RECEIVER IS AMAZING! £789.99

FT-450

Amazing Rx front end performance. (IF DSP). HF + 6m (100W)
£629.99
or FT-450AT (+ ATU)..... £725.99
One customer claimed, "this is the best kept secret of the communications industry".

FT-817 ND

HF + 6m + 2m + 70cms. Incl's battery/charger + antennas. Optional case £22. Extra spare battery £49.99.
OUR PRICE £519.99
STAR BUY - FT-817ND + extra battery + case.....£579.99

MD-200

Broadcast quality dynamic mic. It sounds & looks superb. Fits 8-pin round & 8-pin modular radios. (Optional 6-pin modular adapter £19.99)
SALE PRICE £235.00
Yaesu MD-100A8X....£129.99

TS-590S
HF + 6m

AMAZING RX PERFORMANCE USUAL KENWOOD QUALITY
£1359.99
TS-480SAT.....£775
TS-480HX.....£869.99
Second hand TS-2000E (immaculate).....£1149.99

YOU KITS

HB-1A-Mk3 40/20. 40/20m coverage. SSB/CW/AM. P/O: 3W battery 5W 13.8V.
Ready built
£199.99

DIAMOND SD-330

L: 1.85m. Freq: 3.5-30MHz (200W SSB) 12V DC supply required. (Included 3-way mag mount). Auto tuning.
Type: 1/4 wave - centre loading. Super mobile 'Screwdriver' antenna.
£439.99

PSUs

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear. Dim'ns: 256(W) x 135(H) x 280(D)mm.
A truly professionally made unit built to outlast most PSUs.
30 AMP/12 VOLT PSU
TRUE 'LINEAR' PSU
OUR PRICE £169.99

NISSEI MS-1228

28A at 13.8V yet under 2kgs. (H 57mm, W 174mm, D 200mm approx). Fully voltage protected. Cigar socket & extra sockets at front/rear. Ultra slim.
NISSEI HAVE BECOME RENOWNED FOR PUTTING QUALITY FIRST, YET MAINTAINING A GOOD PRICING STRUCTURE. A TRULY SUPERB POWER SUPPLY UNIT
'Smallest version to date' now with cigar socket.
QUALITY MADE PRODUCT £89.99

DIAMOND GZV-4000

Includes built-in extention speaker
40AMP/13.8V P.S.U.
SALE £149.99
GZV-2500 25 amp version of above. Sale price £129.99

DIAMOND GSV-3000

"Linear power supply". 30A @ 13.8V. 1-15V variable. Diamond quality PSU
OUR PRICE £169.99

WATSON PSU

Power-Mite NF 22amp.....£69.95
Power max (25A).....£89.95
Power max (45).....£125.00
Power max (65).....£225.00
W-10AM 25A (linear).....£59.95
W-25AM.....£89.95

VHF/UHF TX

YAESU VX-7R

6m/2m70cm + wide RX. An amazing 6W water proof hand-held. Case £19.99. Spk mic £32.99. Cigar lead £24.99. BNC adapter £6.00.
Silver £249.99

YAESU VX-8E

6m/2m/70cm. "APRS" with Rx:- 0.5-1GHz. Incl's battery & chgr.
SPECIAL VX-8 + EXTRA BATTERY £319.99
£299.99

YAESU FT-60

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

YAESU FT-8900 R

10m + 6m + 2m + 70cm. (up to 50W).
INCLUDES WIDEBAND RECEIVE AS STANDARD (PLUS DUAL RECEIVE) £369.99
INCLUDES DTMF MIC. OPTIONAL DETATCH KIT £39.99

YAESU FT-7900 R/E

Latest commercial built 2m/70cm mobile + wide Rx. (Incl's DTMF mic) £239.99
FREE YSK-7900 DETATCH KIT THIS MONTH

YAESU FTM-350

2m/70cm Tcvr with APRS & dual Rx (50W O/P). Includes wideband Rx. Includes DTMF mic. £449.99
INCLS FREE GPS ANTENNA UNIT WORTH £70

YAESU FT-2900 R/E
THE GOLIATH OF MOBILES
2m FM (75W)

£135.00

ML-5189

Compact FM mobile. 4m/25W
Incl's DTMF mic £149.99

GIZMOS

NEW SANGEAN ATS-909X

The ultimate all-mode portable shortwave + FM (76-108). Fully coaded portable with improved Rx thanks to a "dsp" tuner. Includes PSU.
£239.99 Del £10

ETON SATELLIT 750

0.1-30MHz SSB/AM 88-108MHz (FM stereo) 118-137MHz airband/rotary antenna. 1000 mems/ rotary tuning/wide-narrow filters & more. + FREE HD-1010 headphones
£299.99

QUANSHENG TG-UV2

2m/70cm hand-held (SW O/P) VOX/CTCSS/DCS 200 channels. Dual watch. Incl's battery and drop in charger.
IN CAR CHARGER.....£24.99
SPEAKER MIC.....£16.99
£81.99 P&P £5.00

ALINCO DJ-596E

2m + 70cm Handie. Includes nickle metal N.M.H.I and charger.
Includes free speaker mic
£149.99

TH-F7E

£235
2m/70cm + wide Rx
Free mic

WOUXUN HANDIES

Post £5.00

KG-UV01P (2m/70cm)...	£92.99	Car chgr	£9.99
6766Z (2m)	£58.99	Spkr/mic	£15.99
New 4m2m	£99.99	Spare batt	£19.99
USB lead + s/ware	£21.00	AA batt box	£11.00
BNC adapter	£6.00	SD-239 adapter	£6.00

All Wouxun handies come complete with battery/charger/antenna, etc.

ANTENNAS

DIAMOND CP-6

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

ATAS-120A

Military spec mobile antenna – superbly made. Covers HF + 6m + 2m + 70cm. *Fully automatic. (*certain Yaesu radios).
OUR PRICE £299.99

NEW INTRUDER III

13 band (80-10/6/2). PL-259 fitting. Includes WARC bands. 13 band version of Intruder II.
£59.99 (2 for £89.99)

INTRUDER II

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

DIAMOND V-2000

6m + 2m + 70cm. 2 section (2.5m long) PL-259 fitting.
Superb quality
£134.99

ACCS

MFJ-949E

£179.99
● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun + dummy load.

MFJ-993B INTELLITUNER

Fully automatic (1.8-30MHz). 300W SSB.
Easy to use ATU.
£249.00

MFJ-259B ANALYSER

1.8-170MHz
£259.99
Case 259B £29.99

MFJ-269 ANALYSER

1.8-170MHz + 70cm
OUR PRICE £339.99
Dip Coils 259/269£29.99 Case 269B £29.99

MFJ-269 pro version	£339.49
MFJ-260C 300W dummy load	£49.99
MFJ-901B ATU	£109.99
MFJ-969 Rollercoaster ATU (300W)	£219.99
MFJ-962D 1.5kW (metered) antenna tuner	our price £279.99
MFJ-994B (600W) intelli tuner	£319.99

SGC


SGC MAC-200	£275.00
SGC-239	£199.99
SGC-237	£309.99
SGC-230	£449.99
SGC-Smart lock	£69.99

LDG PRODUCTS

YT-847	£225.00
AT-1000 PRO II	£184.99
AT-200 PRO II	£209.99
AT-1000 PRO	£499.99
AT-897 plus	£179.95
YT-100	£177.95
Z-817	£119.95
Z-100 plus	£134.95
Z-11 PRO II	£159.95
FT-Meter	£44.95
FTL-Meter	£79.95

LIMITED STOCK

10m PNEUMATIC MAST

We have a small quantity of "military spec" pump-up masts (part of a Government order). All brand new in a crate and supplied with cover (close HT – 6 foot). Anodised green finish.

40m guy kit pack £49.99
Ground fixing spikes (3-off) £35.00
2 foot all ground fixing kit £99.99
(Can be hand operated or by compressor/foot pump)

Del £40 10m MAST, ONLY **£1199.99**

HEAVY DUTY 24ft SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 6 foot that slot together.

SPECIAL BUY

£79.99 each. Del £10 THREE FOR £179.99 DEL £15.00

NEW SWAGED MAST SETS

24 foot mast. 1½" – 4 sections (6ft long). (Swaged)
£49.99 OR 2 SETS £84.99

24 foot mast. 1¼" – 4 sections (6ft long). (Swaged)
£46.99 OR 2 SETS £78.99

H/DUTY CAR BOOT MAST SET

18 foot (1½" dia).
18 foot – 6 x 3 foot (1½") slot together ally sections.

£49.99 each. TWO FOR £79.99 DEL £13.00

NEW CAR BOOT MAST SET

Superb 18 foot (6 x 3 foot sections) that slot together.
Dia: 1¼" ideal to take anywhere. **£39.99**

2 for £74.99 del £13.00

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc.

Simply close shut over cables and notice the difference! Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £14.99 / 5 for £34.99 (P&P £4.00)

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling.
(Fits up to 2" mast) **£13.99** + P&P £4.50

30m pack (4.4mm) nylon guy rope £15.00
132m roll 4.4m nylon guy (480Kg b/f) ..... £45.00 Del £7.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£13.99 + P&P £4.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on WALL BRACKET £2.99 P&P £1.00

30m pack (4.4mm) nylon guy (480kg) £15.00
132m (4.4mm) nylon guy (480Kg) £45.00

HANGING PULLEY

Heavy duty die-cast hanging pulley. Hook and go!

£24.99

BARGAIN WINCH

500kg brake winch. BARGAIN PRICE

£89.99 Del £10.00

(Now includes cable grip)
Winch wall bracket £22.99

BUTTERNUT VERTICALS

HF-2V (80/40m) £279.99
HF-6V (80/40/30/20/15 /10m) £375.00
HF-9V (as HF-6V + 17/12 & 6m) £425.00

TONNA YAGIS

22089 9ele 2m £79.99
220811 11ele 2m £109.99
220817 17 ele 2m £139.95
220818 9ele 2m XD £129.95
220921 21ele 70cm £109.00
2208938 9ele 70cm XD £135.99

LOW LOSS PATCH LEADS

£4.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	£11.99
PL-259 - PL-259	1m	£14.99
PL-259 - PL-259	4m	£19.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£12.99

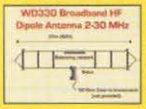
MT-3302

Heavy duty universal mount.
Includes 5m cable **£29.99**

MT-6601

Adjustable roof rack/window bar mount
£19.99

NEW DIAMOND WD-330



Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else. Japanees quality made product WOW **£219.99**

NEW DIAMOND BB6W

2-30MHz (250W) 6.4m long. End-fed wire antenna. Icludes matching balun. Sling up & away you go.

£199.99

CUSHCRAFT BARGAINS

Delivery £15.00

MA5B	Mini beam 10, 12, 15, 17, 20m ..... WOW	£499.99
A4S	4 ele beam (10 - 20m)	£675
A3S	3 ele beam (10-20m) ..... WOW	£599.99
R-8E	Vertical (40 - 6m) "special"	SPECIAL £525

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

SEND SAE FOR LEAFLET **£219.99**

NEW Wire Penetrator 50ft long (1.8-70MHz) £189.99

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end) ..... £34.99 P&P £4.00 (a pair)

TRAPS BACK IN STOCK

BALUNS & TRAPS (1kW)

Baluns 1:1 or 4:1 or 6:1 ..... £39.99 each P&P £4
Traps 80m or 40m or 20m or 15m ..... £39.99 pair P&P £5

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W) ..... £79.95 P&P £6.50
RS-102 1.8-150MHz (200W) ..... £59.95 P&P £6.50
RS-402 125-525MHz (200W) ..... £59.95 P&P £6.50
TM-3000 1.8-60MHz (3kW) Incls mod meter ..... £69.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR ..... £34.99 P&P £5
DL-30 diamond dummy load (100W max) ..... £29.99 P&P £5

D-308B DELUXE DESK MIC

(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£19.99 each). Replacement foam windshield £3.00 + P&P.

Back in stock – 8-pin modular 8-pin round Yaesu adapter £19.99 **£79.99**

W-8010 DIAMOND SHORTENED DIPOLE

80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.

£184.99

GENUINE COAX SWITCHES (P&P £6.00)

2 way CX-201 (0-1GHz) SO239 ..... £24.99
2 way CX-201 'N' (0-1GHz) 'N' £29.99
4 way CX-401 (0-500MHz) SO239 ..... £79.95
4 way CX-401 'N' (0-500MHz) 'N' £89.95

WATSON COAX SWITCHES

(POST £4.00)

CX-SW4N DC-1.5GHz (5xN) £59.99
CX-SW4PL DC-800MHz (5 x SO-239) £56.95
CX-SW3N DC-1.5GHz (4 x N) £49.95
CX-SW3PL DC-800MHz (4 x SO-239) £41.95
CX-SW2N DC-3GHz (3 x N) £32.95
CX-SW2PL DC-1GHz (3 x SO-239) £26.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF ..... £22.00 P&P £3
DC-2 Standard 2-pin/15A fits most VHF/UHF .... £10.00 P&P £3
DC-3 Fits Yaesu FT-7800/8800/8900, etc ..... £17.50 P&P £3

YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round) ..... £44.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) ..... £39.99 P&P £5
MH-31A8J 8 pin modular ..... £39.99 P&P £5

COAX BARGAINS

True military spec real UK coax

RG-58 Military spec x 100m.
£69.99 or 2 for £100.00
Coax stripping tool (for RG-58) £4.99

RG-213 Military spec x 100m (10mm dia).
£199.99/100m or 2 for £300.00

Q-TEK TRI-MAGMOUNT

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

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box

WOW **£319.99** or £369.99 with 25m cable/plugs

G-650C extra heavy duty rotator. ..... £359.99 or £419.99 with cable
G-1000DXC extra heavy duty rotator. ..... £459.99 or £519.99 with cable
G-2800DXC The goliath of rotators £845.99
GS-065 thrust bearing £59.99
GC-038 lower mast clamps £35.99

AR300XL

Quality rotator for VHF/UHF. Superb for most VHF-UHF Yagis, 3-core cable required. 3-core cable £1 per mtr.

GS-050 stay bearing £39.99 OUR PRICE **£89.99**

DIAMOND YAGIS

No tuning required

2m/5 element — No tuning required SO-239 feed £47.99
2m/10 element — No tuning required SO-239 feed £84.99
70cms/10 element — No tuning required SO-239 feed £54.99
70cms/15 element — No tuning required SO-239 feed £69.99
6m/2 element — No tuning required SO-239 feed £89.99

Q-TEK COLLINEARS (VHF/UHF)

Del £10.00

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

DUPLEXERS & TRIPLEXERS

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

MOBILE ANTENNAS

Del £10.00

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

RH-9000 BNC

40cm flexible whip for the ultimate in gain. **£32.99** P&P £5.00
Tx:- 2m + 70cm (Rx:- 25MHz-2.9GHz).

RH-9090 SMA

40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm. Rx:- 25MHz-2.9GHz **£36.99** P&P £5.00

EP-300

Over the ear earpiece. **£9.95** P&P £4.00

RH-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.

£59.99 P&P £5.00

TWIN FEEDER/ LADDER LINE

300Ω Twin Feeder £1/mtr £70/roll
450Ω Ladder £1/mtr £70/roll (100m)

EARPIECE/BOOM MIC

Over ear earpiece + boom mic. Available in Kenwood version or Yaesu/Alinco/Icom.

£24.99 P&P £4.00

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £14.99 P&P £4.00
12 for £24.99 P&P £5.00
30 for £49.99 P&P £10.00

COPPER ANTENNA WIRE ETC

Hard drawn (50m roll) ..... £40.00 P&P £7.50
New: 50m roll, stranded antenna wire ..... £16.99 P&P £7.50
Flexweave (H/duty 50 mtrs) ..... £44.99 P&P £7.50
Flexweave H/duty (18 mtrs) ..... £21.99 P&P £7.50
Flexweave (PVC coated 18 mtrs) ..... £24.99 P&P £7.50
Flexweave (PVC coated 50 mtrs) ..... £59.99 P&P £7.50
Special 200mtr roll PVC coated flexweave ..... £180.00 P&P £10.00
Copper plated earth rod (4ft) + wire clamp ..... £16.99 P&P £8.00
Copper plated earth rod (4ft) as above + wire ..... £27.99 P&P £8.00
New RF grounding wire (10m pack) PVC coated ..... £14.99 P&P £5

METALWORK & BITS (Del Phone)

2" mast-floor base plate £16.99
6" stand off brackets (no U-bolts) £8.99
9" stand off brackets (no U-bolts) £10.99
12" T & K brackets (pair) £19.99
18" T & K brackets (pair) £24.99
24" T & K brackets (pair) £29.99
U-bolts (1.5" or 2") each £2.00

All our brackets are of high quality, British made and galvanised.

8mm screw bolt wall fixings £1.70
8-nut universal clamp (2" to 2") £8.99
2" extra long U-bolt/clamp £7.49
2" crossover plate with U-bolts £16.99
15" long (2") sleeve joiner (1.5" also available) £18.99
3-way guy ring £7.99
4-way guy ring £9.99
Heavy duty guy kit (wire clamp, etc.) £49.99
Set of 3 heavy duty fixing spikes (~0.7m long) £29.99
30m pack (4.4m) 480kg B/F nylon guy £15.00
Roll of self-amalgamating tape 25mm x 10mtr £8.99
Special offer:- Self-amalgamating 3 rolls £20.00

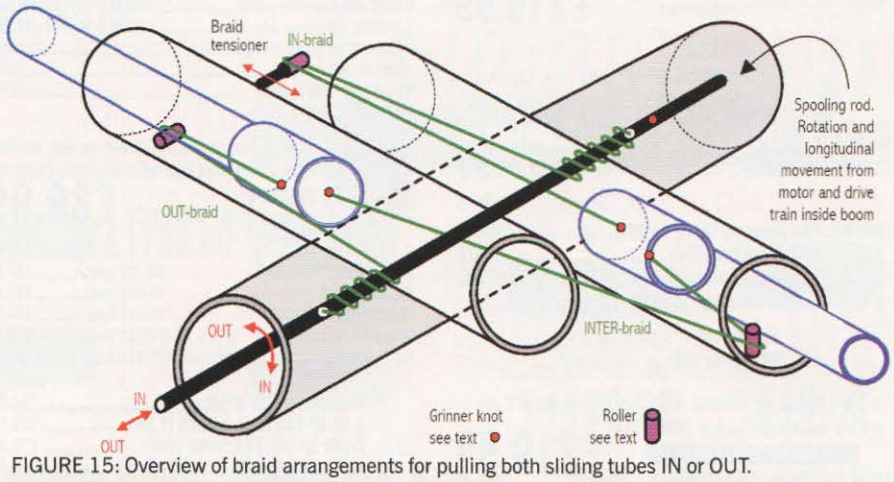


FIGURE 15: Overview of braid arrangements for pulling both sliding tubes IN or OUT.

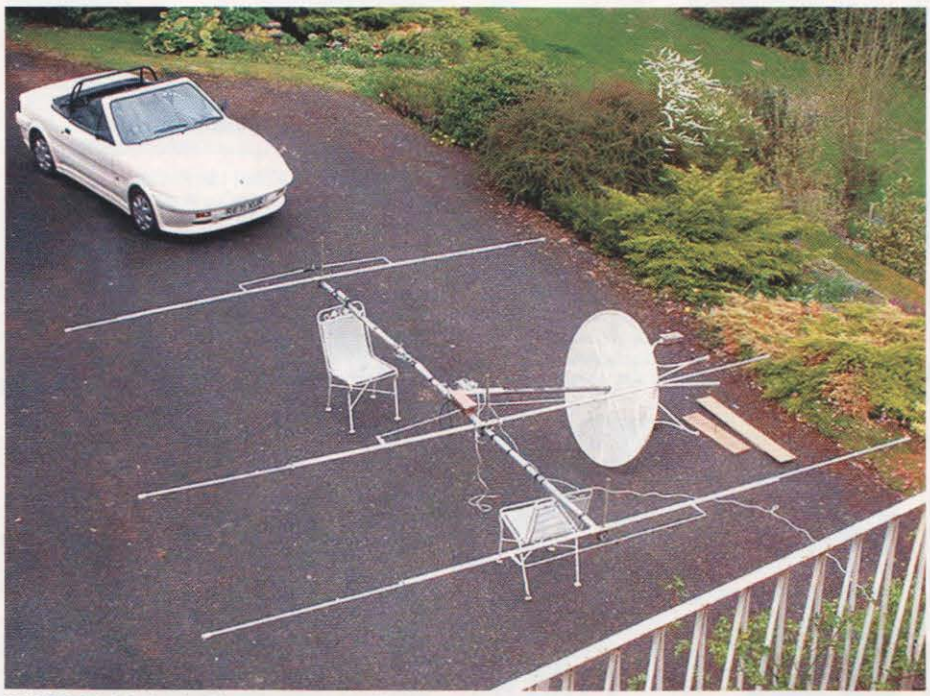


PHOTO 14: Mechanical integration trials. Elements are fully parked.

bit more – until it is sticking out of the far end by about 10mm. Lay off the OUT-braid to the spooling rod and with a generous 200mm further allowance, cut that length.

Push the end of the braid through the hole of the INTER-braid roller on the right hand tube and then out of the tube end. Pull out the sliding tube until it is just more than fully extended and with the bushes showing. Using a Grinner knot, tie on the INTER-braid as per the left hand end of Figure 12. Then push the element all the way back in and a bit more – until it is sticking out of the far end by about 10mm. Lay off the INTER-braid to the attachment screw of the other inner tube and with a generous allowance, cut the braid length.

All 3 braids are now attached at one end only. With both tubes fully retracted, attach the IN-braid via the braid tensioner.

With both tubes protruding by some small but equal amount, attach the other end of the INTER-braid using a Grinner knot – as per the right hand end of Figure 12. I used a stainless steel nut and no washer. Get the braid taut using the nut to alter the tension, taking any gross surplus as turns through a steel nut as necessary.

Now pull out both elements to full extension and take up *most* of the IN-braid slack using the braid tensioner. Leave 60mm of slack length.

You now need the screwdriver motor, for which you will need some electricity. I used a 6V battery with a 10A series diode. A 5V 5A PSU would be fine, or even 4 of the batteries that came with the screwdrivers (if you can arrange to charge them).

Rotate the element around the boom until the IN and OUT braid bushes are 'pointing' at the top and bottom of the spooling rod respectively. Then tighten the element to boom clamp.

Reel in the IN-braid and both elements using the motor. You *must* verify that the spooling rod is rotating clockwise, so just dab the power on briefly first time. Reel it fully in – and about 10mm more. Take this opportunity to re-adjust the length of the INTER-braid as necessary.

You now need to drill the hole in the spooling rod to attach the OUT-braid. See **Photo 13** for the finished appearance of the OUT-braid and its attachment to the spooling rod.

The hole goes opposite the nylon OUT-braid bush but 5mm further out. Mark the spooling rod where the hole is to be drilled. To gain access to drill it, drive the motor out while manually pulling the surplus IN-braid from the boom. When you have enough room to work, drill the hole 1mm diameter – and a further hole about 20mm nearer the end of the spooling rod. Remove sharp edges both sides of both holes and cut off any surplus spooling rod length.

Pull out both elements to take up all the IN- and INTER-braid slack. Drive the elements in again until they are once again over-retracted by 10mm.

Thread the free end of the OUT-braid through its bush, then wind on 4 turns anti-clockwise as tight as you can – then through the first hole in the spooling rod. A pair of long-nosed pliers or tweezers is useful. Pull the braid taut and tape it to the spooling rod. Drive the elements out once again until you have enough access to secure the OUT-braid properly. Wind any surplus braid tightly between the holes and pass the braid through the second hole twice. Whittle a match stick to secure the braid in the second hole. This match is only replaced with multiple overhand knots when all the lengths are fully stable.

Exercising the element. First fit the remaining self-tapping screws in the boom and tighten them all. You now need to drive the element fully IN and fully OUT about 15 times until the braid lengths stabilise. This is mostly just knots tightening and bedding in. Make sure you never drive the elements further out than fully out!

After every OUT, take up any slack in the braid tensioner. After every IN, check the length of the INTER-braid. This carries half the load of the other two braids so tends to settle down sooner.

After about 5 cycles and with the elements over-retracted by 10mm, slacken off the braid tensioner, pull both elements out to give some slack in the OUT-braid, remove the match stick and pull through about 10mm more OUT-braid and resecure it. Readjust the braid tensioner.

THE ELF. The middle of this element is made from two 1700mm lengths of 9.525 x 6.273mm tube and a centre insulator. The centre insulator is approximately 150mm of the sliced GRP tube.

Flatten one end of the aluminium tube. Drill and attach some multi-strand insulated wire tails with stainless hardware. Repeat for the other half. Place them in the sliced GRP tube with a small gap between, seal the ends

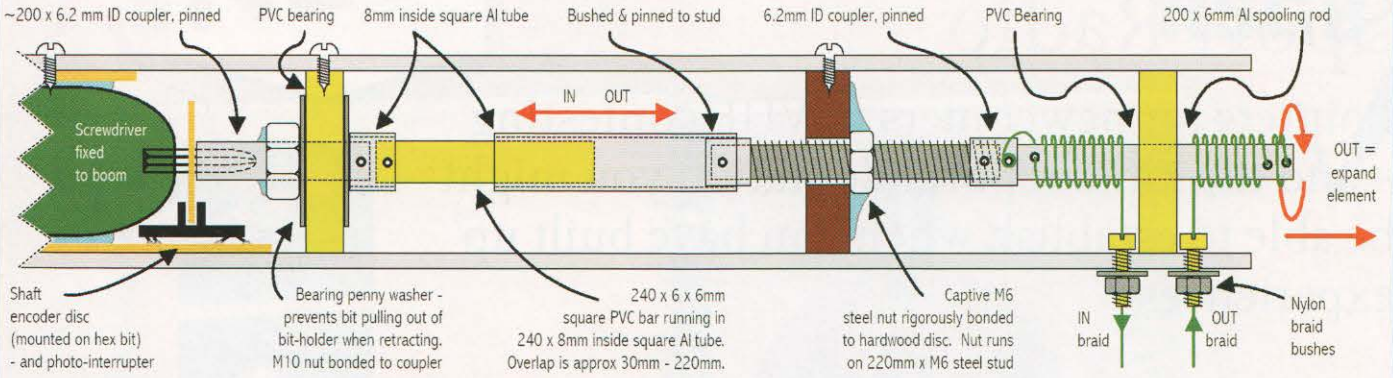


FIGURE 16: Spooling mechanism, not to scale. Entire assembly is approx 1000mm long. Viewed above, ie the OUT braid passes under the spooling rod.

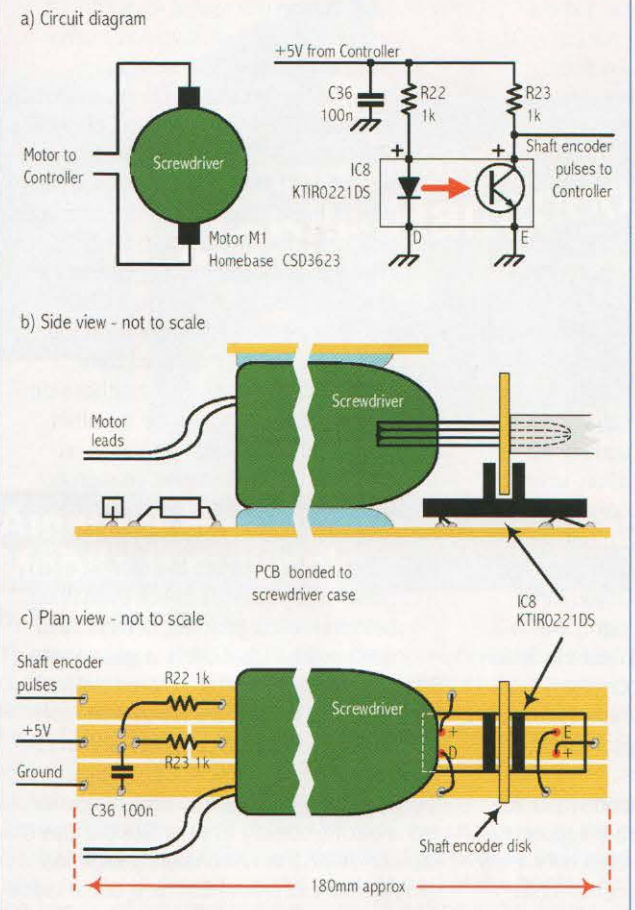


FIGURE 17: Screwdriver electrical and mechanical details.

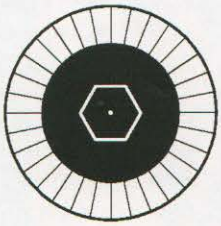


FIGURE 18: Disc template.

temporarily and stuff the GRP tube with mat and resin.

The ELF tips are each a 1m length of 6mm OD, 4mm ID tube, which telescopes for adjustment. Slit the inners and secure with size 00 hose clips.

Fit the element to the boom with a standard TV clamp. Clip on the ELF stub relays adjacent. Solder the element tails to those from the stub relays.

DELTEE MATCH. To my knowledge, this matching system is something new and very useful. It looks like a cross between a Delta match and a Tee match. Hence the name, DelTee match (or δT-match for short). It is the only way I know to feed a Yagi element that cannot be split over 5 bands (ie more than an octave). I arrived at the design by much tentative NEC modelling and then even more trial and error in practice. See **Figure 19** for the detail.

The δT-match arms are screwed to some phosphor bronze strip (draught excluder or fingering) that in turn is soldered to the Controller feed-through washers.

I'm not entirely sure exactly how it works so if you have any ideas, I would love to hear them. My own thoughts are as follows. Having tuned the Yagi on any given frequency for every aspect of performance except SWR, there remains a reactive and a resistive component to remove. Both these components can be removed by altering the length of the FED and changing the value of the series capacitors (in the Controller). This requires all the other element lengths to change as well to maintain the performance, so the process is highly iterative. There are several combinations that give a good match and some sort of performance but, according to NEC, only one combination that delivers it all.

Over the whole frequency span, the result is a Yagi that – if its driven element were split – would have a natural feed impedance between about 20Ω and 60Ω. Not split, it presents 200Ω at the balun terminals. There is very little variation in Yagi performance over that impedance range.

NEXT TIME. The user interface, tuning and achieved performance details will be described. Meanwhile, **Photo 14** shows the first time the complete PICaYAGI was assembled for trials. The car gives a feel for scale. Nostalgic observers will note the same steel garden furniture that was featured on the front cover of the RSGB *Radio Communication Handbook*, 7th edition...

An amateur video showing the workings of PICaYAGI has been posted to YouTube at http://www.youtube.com/watch?v=GAxJLIOvKDM.

WEBSEARCH

[1] www.aluminiumwarehouse.co.uk

[2] http://uk.groups.yahoo.com/group/PICaYAGI

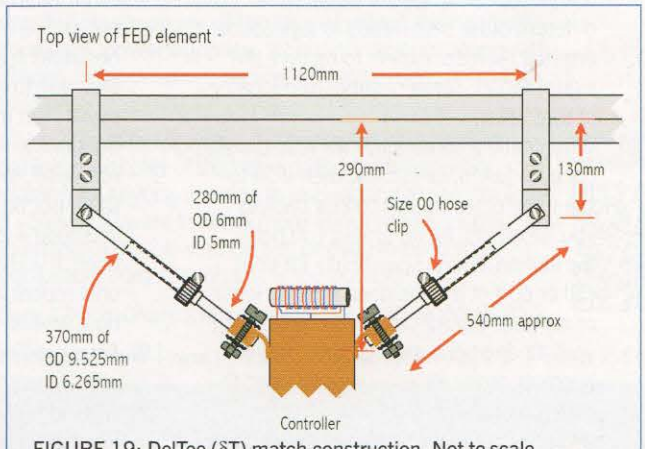
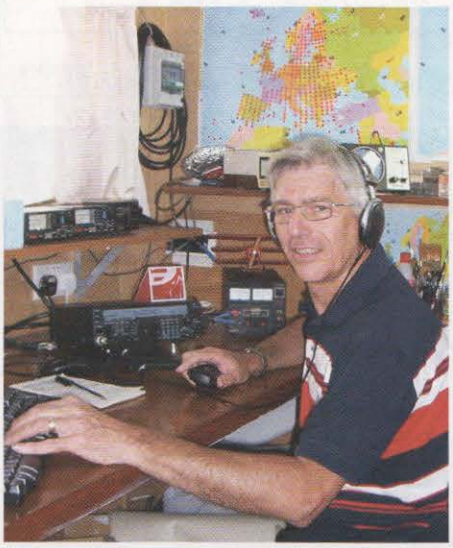


FIGURE 19: DelTee (δT) match construction. Not to scale.

Sport Radio

Pointers for newcomers to VHF contesting – and the kind of portable station you might be able to establish when you have built up experience



Bob Harrison, G8HGN is his shack.

VHF CONTESTING AND OPERATING POINTERS. Bob Harrison, G8HGN, wrote to say, "With the upsurge in entrants to the VHF UKACs and then going on to make QSOs in the bigger contests, it was thought a few tips wouldn't go amiss to make things easier and more enjoyable for entrants. Some tips aren't contest specific, but will help you along.

"First and foremost, put yourself in the other station's position. What does he/she want for a quick and successful QSO? With that in mind, my suggestions are:

1) Give the signal report, serial number and locator in that order. Why? Because most times the operator will be using a keyboard to enter info and will be in a rhythm. Sending your details in a different order often leads to repeats or errors. Likewise, expect to receive the signal report, serial number and locator in that order.
2) When calling someone, give your callsign once, in full, phonetically, then wait to see if the other station comes back to you. Don't call again unless you hear the station asking specifically for your call or part of it. If he doesn't say a letter or number in your call, he's not working you. If conditions are marginal and the operator does call you, you will need to give your callsign three or four times while he/she peaks the antennas. A quick fire 'G9ABC' won't help him, her or you.
3) Know the Locator map by heart. In that way you'll know where to beam and, if you misread a locator, you'll know whether it's impossible or not (eg IO01 for JO01, IO01 being way out in the Atlantic – a bit of a trek for a contest).
4) Know who is likely to be on the band(s). Regular operators make up 85% of the contest participants, so get to know the regular callsigns. Then you'll know where to beam if the signal is initially weak, or where to find that missing multiplier.
5) Don't automatically read back what you've received. If you feel you've copied info incorrectly, ask specifically for the part you need. If 'Roger' is heard the other station is likely to QSY or call CQ again.
6) The other station doesn't usually want to know your name or location, unless you don't know your Locator square. You do know it, don't you? If not, go to http://no.nonsense.ee/qthmap and find it before the next contest. If you input IO92LL in the box on the right, that will get you roughly to the middle of the British Isles. You can pan and zoom from there. By clicking on the map where the cursor is, you'll get the exact locator square. Use the first six characters.
7) Be aware of propagation and where the better paths are – and that propagation can change during a contest, even over a few minutes. See www.dxinfocentre.com/tropo_nwe.html for a guide to upcoming conditions.
8) Be aware that with sharp beams you could be co-channel with another station and not realise it. This could be why you're not making as many QSOs as you would like, due to being masked by a stronger signal. You may have to QSY to find a clear frequency.
9) Above all, take control of your end of the QSO, but be guided by the other end. If you need a repeat, be clear as to what you need. If you are asked to repeat something, only repeat what you are asked for, but do it several times.
10) Always expect the unexpected. Propagation will sometimes throw you a curveball with something out of the ordinary. For example, an Italian calls you on 144MHz. Be prepared for this, even though it's not likely. If you go through the contest exchange methodically, the other station will realise it's a contest and is more likely to give you a serial number without you having to ask.
11) Try to be conversant with French, German, Italian and Spanish numbers, phonetics and basic phrases. For many stations English isn't their first language, so learn a bit of theirs. This can be the difference between making a QSO and not.
12) Please do not use the calling frequencies to call CQ contest or conduct QSOs. This is specifically mentioned in the General Rules on the CC website, www.rsgbcc.org/vhf, 5kHz either side is a guard band too. There are other spot frequencies used by specialist activities to avoid as well. Remember that not everyone is a contester. Others may just want to have a normal QSO.
13) Read the rules before the contest and make sure you cross check everything before entering your log, because you don't want all that effort to go to waste.

OK, there's a lot to absorb and more don'ts than do's, but with a little experience most will come naturally. Be confident and enjoy."

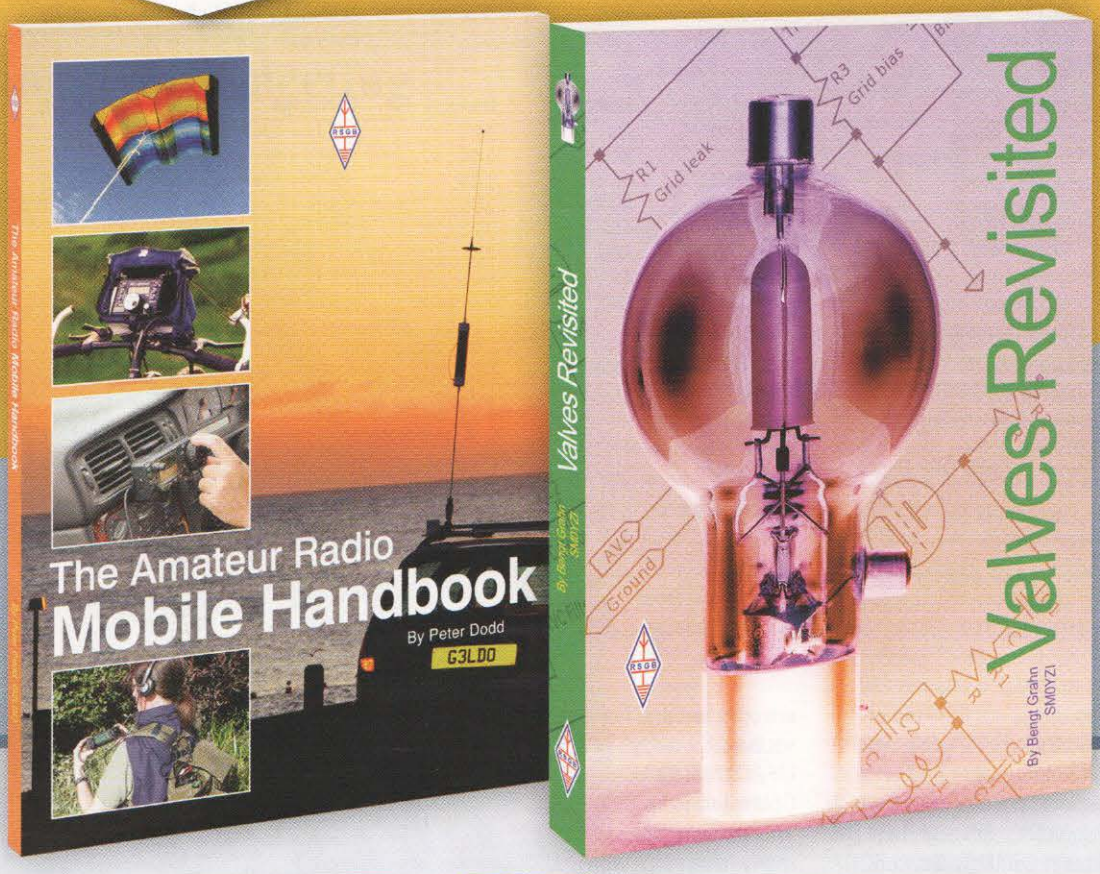
So what do you think of Bob's guidelines? If you can think of others to add, please let me know. Personally, I rather like the idea of someone who has no contesting experience getting their foot on the first rung of the ladder by sitting in with someone who is already experienced, listening and then being given the opportunity to operate. Of course, this is not possible in a single op event, but watching and listening will certainly help. Even just visiting the shack of an experienced contester and seeing how the station is laid out can be helpful.

SERIOUS SINGLE-OP ANTENNAS. Dale Harvey, G3XBY sent some photos of his single-op station on Exmoor in the September 2010 2m Trophy Contest. He says; "The equipment was located in the Passat (which also doubled as bed for the night). The antenna took five hours to put up and four hours to take down! The top 17-ele was at 55ft. Erection was by 'falling derrick' and was at the limit (my limit anyway) for a single op."

Erecting a 55ft mast solo is indeed quite a feat, let alone a 55ft mast with two long

NEW

RSGB shop



Amateur Radio Mobile Handbook

from £10.19

By Peter Dodd, G3LDO

The fascination of taking a radio away from home and making contact with stations both near and far is an enduring one in amateur radio circles. Written by acknowledged mobile expert Peter Dodd, G3LDO *Amateur Radio Mobile Handbook* is for those who regularly "go mobile" or simply want to start doing so.

Mobile operation can offer a great escape from EMC problems or restricted home operation and provide the challenge of the quest for that really good operating location. This book is designed to cover all these aspects of this popular part of the hobby. From the basics of amateur radio mobile, installing radio equipment and antennas in a vehicle, maritime mobile, bicycle mobile to pedestrian mobile you will find it all covered here. In addition, this fully revised and extended second edition of *Amateur Radio Mobile Handbook* contains a chapter on antenna measuring equipment and how to use it. You will even find the use of kite or balloon supported antennas and the experimenting with unconventional antenna arrangements described. There are also guides to the possibilities of APRS and D-Star operation.

In spite of a greater use of electronics and the lack of space in modern vehicles, the availability of lightweight, comprehensive radios means that it has never been easier to become a mobile operator. The *Amateur Radio Mobile Handbook* provides the essential reading for all those who want to get the most out of amateur radio mobile.

Size 240x174mm, 128 pages, ISBN 9781-9050-8671-9

Non Members' Price £11.99 **RSGB Members' Price £10.19**

Valves Revisited

from £14.44

By 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, including microwave ovens and some transmitters. There are hi-fi enthusiasts who argue that valve audio amplifiers give a more accurate and pleasing sound than those using semiconductors.

Valves Revisited is a wide ranging book that provides the basics of how valves work through to how to build your own. There are details of the use of valves in domestic radios, test equipment and amateur transmitters. There are also detailed descriptions of the use of valves in amplifiers, receivers, power supplies, signal generators along with guides to modulation, receiver design, measurement, fault finding and much more.

Valves Revisited provides the principles and practice behind every part of the valve radio and is essential reading for anyone wanting to understand the technology. If you simply want to know more about valves, or plan to restore a classic vintage set, or even to build valve equipment from scratch this is the book for you.

read a sample online
www.rsgbshop.org

Size 174x240mm, 272 pages, ISBN 9781-9050-8670-2

Non Members' Price £16.99 **RSGB Members' Price £14.44**

POST & PACKAGING FREE FROM
See page 76 for full details

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

Radio Society of Great Britain
www.rsgbshop.org

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Sep 3-4	SSB Field Day	1300-1300	SSB	3.5-28	RS + SN
Sep 14	80m Club Sprint	1900-2030	SSB	3.5	Both calls + SN + name
Sep 29	80m Club Sprint	1900-2030	CW	3.5	Both calls + SN + name

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Sep 3-4	144MHz Trophy*	1400-1400	All	144	RS(T) + SN + Locator
Sep 4	5th 144MHz Backpacker	1100-1500	All	144	RS(T) + SN + Locator
Sep 6	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Sep 11	2nd 70MHz	0900-1200	All	70	RS(T) + SN + Locator
Sep 13	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Sep 20	1.3GHz UKAC	1900-2130	All	1.3	RS(T) + SN + Locator
Sep 27	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Sep 27	SHF UKAC	1900-2130	All	2.3-10G	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Sep 3-4	*All Asian DX*	*0000-2359*	*SSB*	*1.8-28*	*RS + age (YLs send 00)*
Sep 3-4	IARU 144MHz	1400-1400	All	144	RS(T) + SN + Locator
Sep 10-11	*WAE DX SSB*	*0000-2359*	*SSB*	*3.5-28*	*RST + SN (Eu works non-Eu only)*
Sep 18	WAB 144MHz QRP Phone	1000-1400	SSB/FM	144	RS + SN + WAB square
Sep 18	BARTG Sprint 75	1700-2100	RTTY	3.5-28	SN
Sep 24-25	CQWW RTTY DX	0000-2359	RTTY	3.5-28	RST + Zone (UK=14)
Sep 25	PW 70MHz	1200-1600	All	70	RS(T) + SN + Locator

Italics indicate that only provisional information was available.
*HF Championship event +VHF Championship event.
For all the latest RSGB contest information and results, visit www.rsgbcc.org.

Yagis bolted on it, so this is not the kind of activity I would recommend to anyone who does not have appropriate experience.

"The antenna is shown pointing south, which produced the strongest DX, although best DX was to the East through Dunkery Beacon, which was 40m higher than my location."

Running 100 watts, Dale's effort put him into third place in the Single Operator Open section, immediately behind the stations that were running full legal power.

THIS MONTH'S EVENTS. Once again it's not a packed month for RSGB HF events, but the first is a big and popular one, namely SSB Field Day. With Open and Restricted sections, it runs for 24 hours over the weekend of the 3rd-4th. Participants will find it useful to have a suitable number ready to give Asian stations that are taking part in the All Asian DX Contest (see later). Following that we move into the second month of the 80m Club Sprints. This month it's SSB on the 14th before CW on the 29th. Once again the requirement is to exchange both callsigns, a serial number and your name (ie no signal report).

The 144MHz Trophy is the first RSGB VHF event. Running for 24 hours over the 3rd-4th, there are five sections to choose between, depending on how much time you can devote, whether you're at home or away, and single- or multi-op. The last three hours of the 144MHz Trophy coincides with the first three hours of the fifth and final 144MHz Backpackers' Contest, which continues for one hour afterwards. In the Backpackers' there are 10 watt 'Hilltopper' and 3 watt 'Backpacker' sections. Those who operate from – or use power from – a vehicle, can only enter the Hilltopper section. For those unfamiliar with backpacker contesting, there are antenna and height restrictions in both sections. Two days later, the first of the month's UKACs takes place on 2m. The 2nd 70MHz Contest runs for three hours on Sunday 11th. This event is a straight race to accumulate as many kilometres worked as possible, with no multipliers. After that it's back to the UKACs for the remainder of the month, 70cm on the 13th, 23cm on the 20th, 6m and SHF on the 27th.

The SSB leg of the All Asian Contest takes place for the entire 48 hours of the weekend of the 3rd-4th. Exchange a signal report and your age (YL ops may give '00'). Only QSOs with stations in Asia count for points, the multipliers being Asian prefixes. Running for the same 24 hours as the 144MHz Trophy Contest is the IARU Region 1 144MHz Contest. If you take part in the RSGB event there will be no need to enter the IARU one, because your log will be submitted for you by the Society. Next comes the All Europe DX SSB Contest that lasts the whole 48 hours of the 10th-11th. Organised by the German national society, DARC, there are sections for Low Power (100W max), High Power (>100W), Multi-op and SWLs. For stations in Europe, the multipliers are non-European DXCC entities. Additional points can be achieved by QTCs, which is the report of a contest QSO back to a European station. For an explanation of this, see the online rules. On Sunday 18th the WAB 144MHz QRP (10W) Phone Contest takes place. Exchange a signal report, serial number and WAB square (the 1st, 2nd, 3rd and 6th digits of your 8-figure National Grid map reference). Multipliers are WAB squares and DXCC countries. RTTY enthusiasts get their opportunity to take part in a contest for

The mobile shack and antenna array used by G3XBY in last year's 2m Trophy Contest.

four hours later in the day, when the BARTG Sprint 75 takes place. All activity is on 75 bauds. Exchange a serial number only. Entries are single-op only and all-bands only, with sections for 'experts' (anyone who has had a top 10 placing in any BARTG contest from 2008 onwards) and all others. RTTY enthusiasts get an even bigger opportunity the following weekend, because the CQWW RTTY DX Contest lasts for the full 48 hours. Exchange a signal report and CQ Zone (Britain is 14). Some rare countries ought to be active in this one. There are too many entry categories to list here though. Finally, the *Practical Wireless* 70MHz Contest takes place for four hours on Sunday 25th. It has sections for Low Power (10W max) and Full Legal.

ARDF

International ARDF Working Group meeting

YOUR RSGB
ARDF: DEDICATED TO DF HUNTING

The M12 podium for the 3.5MHz relay competition at the Czech National Championships held at Turnov in July. Many of the young competitors are the sons or grandsons of Czech amateurs and do not hold amateur licences themselves. The level of participation at this age demonstrates why the Czech Republic does so well in International ARDF. Photo: PA0DFN.

ARDF DISCUSSIONS. It is highly unusual for the IARU Region 1 ARDF WG to meet at a time and venue other than at either a Region 1 or World Championship when the maximum number of countries can be represented. In 2011, the Executive Committee of Region 1 is meeting at Sun City in South Africa during August and it was essential that the ARDF WG met prior to this. As a result, representatives of eleven of the member societies met at Turnov in the Czech Republic in early July. Agendas at these meetings can be pretty tedious but for the 2011 meeting there were some far-reaching decisions to be made.

AGE GROUP RESTRUCTURING. First of these was a Czech proposal, which recognised that the W35 (women aged 35 to 49) age group was too wide and, as a result, had an unacceptably wide variation of ability across the age range. The Czech Society wanted to address this with a wholesale restructuring of the age categories and to introduce common categories for men and women based around a change of category in the year a person reaches an age ending with a 5. This was in place of the current system where changes occur when the age ends in a 0 with the exception of W35.

The RSGB submitted a paper proposing a way of addressing the W35 issue but without the upheaval of wholesale alterations to the age groups.

The issue went to a vote with virtually all the western European nations who voted, plus Poland and the Ukraine, supporting the RSGB proposal whilst eastern European nations generally supported the Czech proposal. The whole thing proved very divisive with a nearly equal split in the voting. Rainer Floesser, DL5NBZ, the Chairman, suggested that the WG should seek more consensus on the issue before taking a final division. To this end the WG agreed to take the matter to a meeting to be held in Romania in September with the proviso that a two thirds majority would be required if there was to be any change.

FOXORING: The second significant issue was the move to put FoxOring on a more formal footing by the adoption of an agreed set of rules for IARU Region 1. A draft was submitted by the Czech National Society and the RSGB provided a commentary on these for consideration. The main points that emerged for international events were:

- FoxOring will be restricted to the 3.5MHz band because at 144MHz, screening and siting give very variable coverage by the transmitters.
- The transmitters are to be audible anywhere within the circle marked on the map.
- The maximum number of transmitters to be hunted will be 10 but a greater number may be deployed in big events to discourage following.
- Transmitters are to send all the time.
- Each transmitter sends a unique callsign in Morse code commencing with the letters MO.
  A final version is now in preparation.
- Transmitters must not be audible more than 150m from their location.
- Audibility is to be assessed by a 'defined receiver' that has a specified antenna system and a specified sensitivity.

ARDF FOR THE BLIND: Amateur radio has long had attractions for blind people since many of the possibilities that the hobby offers are open to blind operators. The Region 1 ARDF Working Group is exploring ways in which ARDF competitions could be provided for blind participants and are in the process of formulating a set of rules for these competitions. It is anticipated that these rules will be finalised at the next meeting in Romania in September.

If someone you know is blind disabled then it would be helpful if you would establish whether or not they are interested in this new initiative and if so, communicate this to me. Go to YouTube and search on 'ARDF for the Blind' to see some video clips of the inaugural event held in conjunction with the 2010 World Championships in Croatia. Clip 4 probably gives the clearest view of the procedure adopted.

There is a proposal to hold an international event at Friedrichshafen in 2012 and, if sufficient interest is shown, the ARDF Committee will look at organising an event in the UK in 2012 prior to the international event.

All RSGB competitors at international ARDF competitions are self-funded.

UK ARDF EVENTS IN SEPTEMBER AND OCTOBER

Saturday 17 September, East Midlands.

144MHz, plus the first UK event using the 3.5MHz sprint format (5 transmitters, 12 second transmissions and no Tx spacing restrictions).

Saturday 15 October, Long Valley, Aldershot.

RSGB shop

The latest A

	ANTENNA BOOKS		
SASS	ARRL Small Antennas for Small Spaces	£17.99	**£15.29**
STLH	Stealth Antennas	£13.99	**£11.89**
HFAE	HF Antennas for Everyone	£14.99	**£12.74**
AGAT	ARRL Guide to Antenna Tuners	£17.99	**£15.29**
ACV8	ARRL Antenna Compendium Vol. 8	£18.99	**£16.14**
ATRA	ARRL Antenna Towers for Radio Amateurs	£27.99	**£23.79**
ADNB	ARRL Antenna Designer's Notebook	£27.99	**£23.79**
AFVA	Antennas for VHF and above	£12.99	**£11.04**
UBAN	ARRL Basic Antennas	£24.99	**£21.24**
BSHA	Building Successful HF Antennas	£14.99	**£12.74**
AB2I	ARRL Antenna Book	£30.99	**£26.34**
MVAC	ARRL More Vertical Antenna Classics	£13.99	**£11.89**
PWA2	Practical Wire Antennas 2	£11.99	**£10.19**
INAC	International Antenna Collection	£12.99	**£11.04**
INA2	International Antenna Collection 2	£12.99	**£11.04**
ANTO	Antenna Topics	£18.99	**£16.14**
BKYA	Backyard Antennas	£18.99	**£16.14**
NACO	HF Antenna Collection	£19.99	**£16.99**
HFAL	HF Antennas for all Locations	£19.99	**£16.99**
SAFA	ARRL Simple & Fun Antennas for Hams	£16.99	**£14.44**
YAAC	ARRL Yagi Antenna Classics	£13.99	**£11.89**
ACV1	ARRL Antenna Compendium VOL 1	£15.99	**£13.59**
ACV2	ARRL Antenna Compendium VOL 2	£12.99	**£11.04**
ACV3	ARRL Antenna Compendium VOL 3	£12.99	**£11.04**
ACV4	ARRL Antenna Compendium VOL 4	£15.99	**£13.59**
ACV5	ARRL Antenna Compendium VOL 5	£15.99	**£13.59**
ACV6	ARRL Antenna Compendium VOL 6	£17.99	**£15.29**
ACV7	ARRL Antenna Compendium VOL 7	£18.99	**£16.14**
WACS	ARRL Wire Antenna Classics	£12.99	**£11.04**
MWAC	ARRL More Wire Antenna Classics VOL 2	£12.99	**£11.04**
VACS	ARRL Vertical Antenna Classics	£12.99	**£11.04**
VUCS	ARRL VHF/UHF Antenna Classics	£12.99	**£11.04**

ther postage charges

	BEGINNERS		
AREX	Amateur Radio Explained	£5.79	**£4.92**
PAFN	Practical Antennas for Novices	£7.99	**£6.79**

	CALLBOOKS		
CB12	RSGB Yearbook 2012 Edition	£19.99	**£16.99**
CS12	Callseeker Plus 2012 (CD)	£15.99	**£13.59**
WC11	World Call CD – Winter 2011	£46.99	**£39.94**

	EMC & RFI		
ELEN	Elimination of Electrical Noise	£6.99	**£5.94**
RFI3	ARRL RFI Book 3	£23.99	**£20.39**
FRIN	Single Ferrite Ring	£2.25	**£1.91**
FIL3	Filter 3	£10.00	**£8.50**
FIL2	Filter 2	£10.00	**£8.50**
FIL7	Filter 7	£10.00	**£8.50**
FIL8	Filter 8	£29.99	**£25.29**
FL15	Filter 15	£10.00	**£8.50**

	GENERAL READING		
EGUO	Edgar Harrison	£14.99	**£12.74**
CBFD	Circuit building for Dummies	£15.99	**£13.59**
GPTW	The Greatest Podcasting Tips in the World	£6.99	**£3.99**

	VHF/UHF BOOKS		
SMHB	6m Handbook	£13.99	**£11.89**
VHF2	VHF/UHF Handbook	£14.99	**£12.74**
YGVU	Guide to VHF/UHF	£8.99	**£7.64**

	TECHNICAL BOOKS		
VARV	Valves Revisited	£16.99	**£14.44**
AH11	ARRL Handbook 2011	£37.99	**£32.39**
UNB2	ARRL Understanding Basic Electronics	£26.99	**£22.94**
RG09	The Rig Guide (including p&p)		**£4.99**
PPEG	125 Physics Projects for the Evil Genius	£14.99	**£12.74**
HORE	ARRL Hands-On Radio Experiments	£14.99	**£12.74**
WEEK	Weekend Projects	£13.99	**£11.89**
RADN	Radio Nature	£16.99	**£14.44**
HFA2	HF Amateur Radio	£12.99	**£11.04**
RFDB	RF Design Basics	£17.99	**£15.29**
LPAR	ARRL Low Profile Amateur Radio	£14.99	**£12.74**
PSHB	Power Supply Handbook	£15.99	**£13.59**
PICB	Pic Basics	£16.99	**£14.44**
CIRO	Circuit Overload	£14.99	**£12.74**
RREG	22 Radio & Receiver Projects for the Evil Genius	£14.99	**£12.74**
EGEG	Electronic Gadgets for the Evil Genius	£14.99	**£12.74**
ARES	Amateur Radio Essentials	£15.99	**£13.59**
EPRC	ARRL Emergency Power for Radio Comms	£14.99	**£12.74**
HART	25 years of Hart Reviews	£14.99	**£12.74**
RFAC	ARRL's RF Amplifier Classics	£14.99	**£12.74**
DMFO	Digital Modes for all Occasions	£16.99	**£14.44**
TEC1	RSGB Technical Compendium	£17.99	**£15.29**
TT50	Technical Topics Scrapbook - All 50 years	£14.99	**£12.74**
TTSB3	Technical Topics Scrapbook 1995-99	£14.99	**£12.74**
TTSB2	Technical Topics Scrapbook 1990-94	£13.99	**£11.89**
EMRD	ARRL Experimental Methods in RF Design	£34.99	**£29.74**
HK17	ARRL Hints & Kinks for the Radio Amateur	£13.99	**£11.89**
AICH	ARRL Image Communications Handbook	£19.99	**£16.99**
PSCB	Power Supply Cookbook ***SPECIAL OFFER***	£19.99	**£19.99**
DSPT	ARRL Digital Signal Processing Technology	£34.99	**£29.74**
IRFD	Introduction to Radio Frequency Design	£29.99	**£25.29**

	OPERATING & DX		
LDX5	ARRL Low Band Dxing - 5th Edition	£34.99	**£29.74**
OPM7	RSGB Radio Amateur Operating Manual	£16.99	**£14.44**
HBCB	Homebrew Cookbook	£12.99	**£11.04**
ROAR	ARRL Remote Operating for Amateur Radio	£19.99	**£16.99**
SSAR	Storm Spotting for Radio Amateurs	£19.99	**£16.99**
WLOD	World Licensing and Operating Directory	£12.99	**£11.04**
DXCH	ARRL DXCC Handbook	£14.99	**£12.74**
RADO	Radio Orienteering – ARDF Handbook	£9.99	**£8.49**
MOVE	ARRL's Amateur Radio on the Move	£14.99	**£12.74**
DOTE	ARRL DXing on the Edge	£18.99	**£16.14**
WHOS	Who's who in Amateur Radio	£14.99	**£12.74**

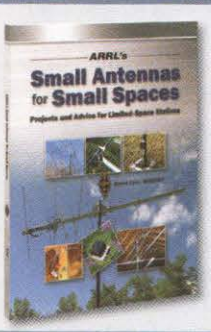
	COMPUTING AND RADIO		
CIAR	Computers in Amateur Radio	£16.99	**£14.44**
PPFB	ARRL Pic Programming for Beginners	£32.99	**£28.04**
VOIP	ARRL VoIP Internet Linking for Radio Amateurs	£15.99	**£13.59**
RTTY	RTTY/PSK31 for Radio Amateurs	£7.99	**£6.79**
HFDH2	ARRL HF Digital Handbook 4th Edition	£14.99	**£12.74**
VHDH	ARRL VHF Digital Handbook	£14.99	**£12.74**
COMM	CoMmand	£16.99	**£14.44**

	MORSE CODE		
MC10	Morse Code for Radio Amateurs	£7.99	**£6.79**
INMC	Learning the Morse Code (CD)	£9.99	**£8.49**

	PROPAGATION		
RPPP	Propagation - Principles & Practice	£14.99	**£12.74**

ARRL's Small Antennas for Small Spaces

from **£15.29**



By Steve Ford, WB8IMY

Amateur Radio operators love antennas and generally the bigger the better but not everyone has acres of property to erect their dream antenna. *ARRL's Small Antennas for Small Spaces* is designed for those who live in apartments, condominiums, or houses on small lots. Whilst the US view of what constitutes a small antenna may be different to the UK view, this book is a valuable resource filled with practical advice. You will find design ideas, antennas you can use inside your home, outdoor designs including dipoles, inverted Ls, end-fed wires, loops, verticals and temporary antennas for HF. You will also find a collection of limited space antenna ideas from well-known amateurs. *ARRL's Small Antennas for Small Spaces* provides ideas and projects that will get you on the air regardless of where you live!

Size 276x209mm, 128 pages, ISBN 9780-8725-9839-3

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

POST & PACKAGING FREE

Order on the internet at **www.rsgbshop.org** or you can order by post making cheques and postal orders crossed and made payable to Radio Society of Great Britain or telephone your credit card order to **01234 832 700**. Open 8.30-4.30 (Mon-Fri). Send no cash. **Post & Packing:** Standard Delivery - 2nd Class Post (4-9 Days), For one item £1.95, For two or more items: £3.50, **For orders over £30.00 standard delivery is FREE.** Priority Delivery - 1st Class Post (2-4 Days), For one item £2.95, For two items: £4.95 , For three or more items: £5.95. **Overseas:** Worldwide Surface Delivery, For one item £3.00, For two items: £5.00, Extra items: £1.00 per item. Worldwide Air Delivery: For one item: £9.00, For two items: £15.00, Extra items: £3.00 per item P&P for the **W-8681-SOLAR Wireless Weather Station** is £7.95 to UK mainland. For Non UK mainland, please contact sales@rsgb.org.uk. This is in addition to other postage charges for books etc.

ateur Radio titles

RADCOM			
0RCB	RadCom Back Issues		**£4.75**
EAZI	RadCom Easi-Binder		**£9.99**
BV10	RadCom Bound Volume 2010		**£49.99**
SINGLE YEAR RADCOM CDS			
RC**	Available from 1996 – 2010 Price for Each Year	£19.99	**£16.99**
RADCOM CD-ROM SETS			
RC9195	RadCom 1991-95 Set	£29.99	**£25.49**
RC8690	RadCom 1986-90 Set	£29.99	**£25.49**
RC8185	RadCom 1981-85 Set	£29.99	**£25.49**
RC7680	RadCom 1976-80 Set	£29.99	**£25.49**
RC7075	RadCom 1970-75 Set	£29.99	**£25.49**
RC6469	RadCom 1964-69 Set	£29.99	**£25.49**
RC5363	RadCom 1954-63 Set	£29.99	**£25.49**
RC3953	RadCom 1939-53 Set	£29.99	**£25.49**
MICROWAVES			
MKHW	Microwave Know How	£12.99	**£11.04**
IMH2	International Microwave Handbook 2	£16.99	**£14.44**
MICP	Microwave Projects 1	£16.99	**£14.44**
MIP2	Microwave Projects 2	£16.99	**£14.44**
IOTA			
IFVR	ISLAND FEVER	£19.99	**£12.99**
ID15	IOTA Directory	£11.19	**£10.19**
MONTHLY PUBLICATIONS			
QST1	ARRL Subscription 1 Year		**£44.00**
QST2	ARRL Subscription 2 Year		**£82.00**
QST3	ARRL Subscription 3 Year		**£115.00**
QSTC	ARRL Subscription CD only 1 Year		**£32.00**
QSTC2	ARRL Subscription CD only 2 Years		**£62.00**
QSTC3	ARRL Subscription CD only 3 Years		**£89.00**
PACKET & APRS			
PRPR	Packet Radio Primer	£9.99	**£8.49**
LOW POWER (QRP)			
INQC	International QRP Collection	£12.99	**£11.04**
LPC3	ARRL Low Power Communications	£14.99	**£12.74**
MQRP	More QRP Power	£16.99	**£14.44**
QRPB	QRP Basics	£14.99	**£12.74**
MAPS			
RAMW	Radio Amateur's Map of the World	£6.99	**£5.94**
PRE9	RSGB Prefix Guide 9th Edition	£8.99	**£7.64**
RAWA	Radio Amateurs World Atlas	£9.99	**£8.49**
SPACE & SATELLITES			
ARA2	Amateur Radio Astronomy - 2nd Edition	£16.99	**£14.44**
SAT2	ARRL Satellite Handbook	£19.99	**£16.99**

SHORT WAVE LISTENING			
MM11	abc Military Aircraft Markings	£11.99	**£8.99**
CM11	abc Civil Aircraft Markings	£11.99	**£8.99**
VREX	Virtual Radar Explained	£6.99	**£5.94**
ABR7	Air Band Radio Guide	£9.99	**£7.49**
AT10	Air Traffic Control	£9.99	**£7.49**
HISTORY BOOKS			
SSAW	Seaspray and Whisky	£9.99	**£7.49**
SLOC	Secret Location	£8.99	**£7.64**
IN40	Inside Room 40	£19.99	**£14.99**
TSR2	The TSR2 Story	£19.99	**£14.99**
SLBB	Spies Who Lost the Battle of Britain DVD	£12.99	**£9.99**
INEG	Inside Enigma	£14.99	**£12.74**
IMAS	Images Across Space	£19.99	**£14.99**
ORFD	Most Secret: The Hidden History of Orford Ness	£14.99	**£11.24**
BDTR	The Bedford Triangle	£9.99	**£7.49**
HSOE	Heroines of SOE	£18.99	**£14.24**
HSPT	Haynes Manual for Supermarine Spitfire	£19.99	**£16.99**
H109	Haynes Manual for Messerschmitt Bf109	£17.99	**£15.29**
WRST	What Really Sank the Titanic	£9.99	**£7.49**
RENH	The Real Enigma Heroes	£19.99	**£16.99**
FCIR	Full Circle: A Dream Denied, A Vision Fulfilled	£10.99	**£9.34**
AVRO	Avro Vulcan: Britain's Cold War Warrior	£19.99	**£11.99**
ENUB	Enigma U-Boats	£8.99	**£6.74**
CAPE	Capturing Enigma	£8.99	**£6.74**
HLAN	Haynes Manual for Avro Lancaster	£17.99	**£15.29**
HAPO	Haynes Manual for Apollo 11	£19.99	**£16.99**
BSAC	Between Silk and Cyanide: A Code maker's War	£14.99	**£12.74**
ABOC	A Bit of Controversy	£13.99	**£11.89**
PTCG	Perera's Telegraph Collectors Guide	£9.99	**£8.49**
CHJH	Captain Henry Jackson of HMS Defiance	£9.99	**£8.49**
TSOE	The Story of Enigma (CD)	£9.99	**£8.49**
TCCD	Perera's Telegraph Collectors CD	£9.99	**£8.49**
BOXS	1940s Amateur Radio Set	£15.99	**£13.59**
WATF	World at Their Fingertips	£9.99	**£8.49**
TRAINING			
EXSE	Amateur Radio Exam Secrets	£12.99	**£11.04**
FNOW	Foundation Licence - NOW!	£4.99	**£4.24**
IMD5	Intermediate Licence Book	£6.99	**£5.94**
ADVA	Advance! The Full Licence Manual	£11.99	**£10.19**
IEXM	International Amateur Radio Exam Manual	£14.99	**£12.74**
LOGGING			
DL12	Deluxe Log Book 2012	£4.99	**£4.24**
LBAR	Log Book - Transmitting	£4.99	**£4.24**
LBRX	Log Book - Receiving	£4.99	**£4.24**
COVL	Logbook Cover for LBAR or LBRX	£6.50	**£5.53**
LOW FREQUENCY			
LFT2	LF Today 2nd Edition	£12.99	**£11.04**

New books displayed Red RSGB Members' Prices displayed **BOLD**

RSGB SHOP ORDER FORM

PLEASE PRINT ALL

NAME CALLSIGN

ADDRESS

POSTCODE TELEPHONE E-MAIL

QUANTITY	CODE	DESCRIPTION/TITLE	PRICE	TOTAL

PLEASE CHARGE MY CREDIT/DEBIT CARD

EXPIRY DATE START DATE CVV2* ISSUE NUMBER

*3 DIGIT CODE FROM THE BACK OF YOUR CARD

P&P

TOTAL

SIGNATURE DATE

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

Radio Society of Great Britain
www.rsgbshop.org

HF F-Layer Propagation Predictions for September 2011

Compiled by Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe								
Moscow	82.....1778	87.....27888	.4.223468874	..76777886..	..5899998...	...67777....	.....	.....
*** Asia								
Yakutsk	.....	.....54.	.3.....57777	..6656654...	...666.....	....5.....	.....	.....
Tokyo	.....3..	.....378..	.....3..	.....	.....	.....	....5.....	.....
Singapore	.....122.	68872	.....565..	.....55...	.....465...	.....4....	.....	.....
Hyderabad	.....	2544	6654	.....465..	.....54...	.....4....	.....	.....
Tel Aviv	98.....6889	996....39999	..6....68873	...5335785..	...555667...	.....	.....	.....
*** Oceania								
Wellington	.....	.....4...	.....5...	.....	.....	.....	.....	.....
Well (ZL) (LP)	.....	..6.....	..6.....	..4.....	.....	.....	.....	.....
Perth	.....	.....3766.	.....6765.	.....54...	.....	.....	.....	.....
Sydney	.....	.....477..	.....2777..	.....5634..	.....	.....	.....	.....
Melbourne (LP)	.....	..89.....	37895.....	66797.....5	...96....46.	...8.....6.	.....	.....
Honolulu	.....	.....	..563.....	...34.....	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....6...	.....	.....	.....	.....
W. Samoa	.....	.....	..5643.....	...4665.....	....666.....	....455.....	.....	.....
*** Africa								
Mauritius	2.....222	7.....7887	6.....48887	78853	.....45...	.....	.....	.....
Johanesburg	.....	25.....2665	37.....8987	.....987.	.....587..	.....585..	.....6...	.....
Ibadan	.1.....	67.....456	676.....3676	..7.....675.	..56...677..	...7545688..	...6...784..	.....46...
Nairobi	2.....1	76.....4777	55.....4455	26664	..4....566..	.....4663..	....55676...	.....
Canary Isles	675.....666	888.....2888	8886...27888	6.7854567886	...99999897.	...9999999..	...5776786..	....55556...
*** S. America								
Buenos Aires	.....	434.....3	7672.....77	3.....463	.....5..	.....4..	.....	.....
Rio de Janeiro	.....	545.....45	868.....788	4.3.....874	.....7..	.....6..	.....	.....
Lima	.....	422.....2	7556.....66	...5.....5.	.....	.....	.....	.....
Caracas	.....	433.....3	8887.....78	4..75....675	....7533574.	....566667..	.....4..5...	.....
*** N. America								
Guatemala	.....	322.....	6557.....6	...5.....3.	.....	.....	.....	.....
New Orleans	23.....	776.....5	7475.....6	.....5.	.....	.....	.....	.....
Washington	442.....	7772.....6	7763.....57	574	.....35..	.....455...	.....	.....
Quebec	66.....5	776.....67	3..4.....365	....3..356..	.....	.....	.....	.....
Anchorage	.....	.....	..643.....45	.....663.	.....67..	.....	.....	.....
Vancouver	.....	.2.....	.....	.....	.....55..	.....	.....	.....
San Francisco	.....	.22.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....4....	.....5....	.....5....	.....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong. The RSGB Propagation Studies Committee provides propagation predictions on the internet at **www.rsgb.org.uk/propagation/index.php**. An input power of 100W and a dipole aerial has been used in the preparation of these predictions; therefore a better equipped station should expect better results. The predicted smoothed sunspot numbers for September, October and November are respectively (SIDC classical method – Waldmeier's standard) 68, 73 & 78 and (combined method) 69, 74 & 80. The provisional mean sunspot number for July 2011 was 43.9. The daily maximum / minimum numbers were 78 on 18 July and 10 on 25 July.

RadCom

Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, e-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. The deadline for the October *RadCom* is 1 September and for the November edition it's 28 September. For GB2RS, the deadline is 10am on the Tuesday for the week of broadcast.

REGION 1: SCOTLAND SOUTH & WESTERN ISLES

REGIONAL REP: LEN PAGET, GM0ONX, RM1@RSGB.ORG.UK

BORDERS ARS
Danny, 2M0CDO, 01890 882 850
9 Horizontal antenna VRPs by Ian, GM8IIO

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
2 Normal club night
23 144MHz DF hunt, Old Ship Inn Car Park

KILMARNOCK & LOUDOUN ARC
Graham, MM3GDC, mm3gdc@btinternet.com
13, 27 Club night

LIVINGSTON & DARS
Norman, 07740 946 192, uk.groups.yahoo/group/ms0liv
6, 20 Club evening
13 Operating evening
27 Morse code practice

Dunoon & Cowal ARC would like to offer its good wishes and good DX to Brian, MM6ANY; Thomas, MM6KNE and Alistair, MM6COU who successfully passed the Intermediate exam held at the club. The course and exam was held under the guidance of Barry, GM0KZX, Tony, GM7KFS and Brian, MM1HMV.

In July, members of **Borders ARS** were lucky enough to be given a comprehensive, interesting and detailed talk by the RSGB President Dave Wilson, M0OBW. Dave's talk covered the many facets of the RSGB's activities including the importance of Spectrum Defence. During the course of the presentation, BARS members also learned about the new National Radio Centre at Bletchley Park. This will showcase radio communications as an important economic factor in the 21st century and, hopefully, will help to raise the profile of amateur radio as an exciting and absorbing hobby, in turn helping to address the challenge of attracting new members and increasing the activity of existing ones. All the members of BARS would like to extend their thanks to Dave for such and interesting and informative talk.

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL REP: DENNY MORRISON, GM1BAN, RM2@RSGB.ORG.UK

ABERDEEN ARS
Lewis, GM4AJR, 01224 575 663, www.radioclubs.net/aars
1 Junk sale
3 Weekend event - SSB Field Day
8 Talk by Graham, GM8FFX
15 Morse practice & on the air

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
12 North West Air Ambulance
26 Show and tell evening

CHESTER & DARS
Barbara Green, 07957 870 770, www.chesterdars.org.uk
6 L/C meter project & website presentation
13 Committee meeting
20 The other man's shack
27 Operating evening

SOUTH MANCHESTER R&CC
Ron, G3SVW, 01619 693 999
1 Bubble chambers, Ged, G8RSI
8 Antenna & propagation clinic, Ron, G3SVW
15 Swedish DXpedition, Peter, G0BHP
22 Autumn equinox surplus equipment sale
26 Technical forum
29 Flanders Swann, Graham, G8TXW

THORNTON CLEVELEYS ARS
www.tcars.org.uk
5 Natter night
12 Electromagnetic systems in the aerospace industry, Ian MacDiarmid (BAE)
9 Mint with a hole by Ted, G3WBB
26 Talk on construction

In June, members of **South Cheshire ARS** took part in Museums on the Air and it was a double first for the club – the first time being involved with this event and the first time operating from the Hack Green Secret Nuclear Bunker near Nantwich. The weather was changeable from warm and sunny to wet and windy. That did not stop members setting up three stations and enjoying the weekend operating on 2m FM, HF SSB and PSK.

Christian, 2E0HST was fortunate to be able to operate from within a Russian ZIL radio truck belonging to club member Joe, G4PMY. Conditions were variable but three contacts into Japan (one on 10 watts) on Saturday afternoon were very well received by the members present. Dave Wilson, M0OBW, RSGB President, visited for a few hours on Saturday and soon had a microphone in his hand.

Sunday brought more of the same weather wise and variable working conditions yet again. That was no deterrent and the lads were soon operating.

The weekend was enjoyed by all who took part and are already looking forward to doing it again next year.

Members of the 90 (Speke) Sqn Air Trg Corp radio club presented a cheque for over £400 to their local Marie Curie Cancer Hospice following their recent sponsored radio weekend.

REGION 4: NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, G0UGE, RM4@RSGB.ORG.UK

ANGEL OF THE NORTH ARC
Nancy Bone, G7UUR, 01914 770 036, nancybone2001@yahoo.co.uk
5 OTA, prep for Churches & Chapels on the Air
9 Weekend event - Heritage Open Days, Whitehall Road Methodist Church
10 Churches and Chapels on the Air, 10am - 5pm
12 Intermediate exam
17 Fog on the Tyne Rally
18 Great Northern Hamfest
19 Report on the rally & discussion of future projects
26 Talk

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240 573, gmacnaughtwov@yahoo.co.uk
3 Weekend event: SSB Field Day
7 Fox hunt
14 80m Club Sprint SSB
21 Visit by RSGB President for HARC 40th anniversary
28 Activity + DVD
29 80m Club Sprint CW

RIPON & DARS
Rob Hall, MORBY, 07876 085 631, www.ripon.org.uk
1 Prep for SSB Field Day
8, 22, 29 On the air & club night
15 Digital modes demo night

SHEFFIELD ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
5 Social evening + Foundation taster 1
12 Technical forum + Foundation taster 2

SHEFFIELD ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
19 Talk by M0EQD
26 Mini flea market & quiz or video night

TYNEMOUTH ARC
Bob, M6KLO, mail@g0nwm.com
2 Briefing for RSGB Field Day
3 RSGB Field Day
9 Overview of the IARU HF Contest 2011
10 CHOTA - Churches on the Air, 10am – 5pm
14 RSGB 80M SSB Club Sprint (G5N)
16 Radio & related book exchange and sale
23 Discussion, operating and Morse training

In 1949, Walter Farrar, G3ESP placed an advert in *Short Wave Magazine* for those interested in 'wireless experiments' to attend a meeting in the Swan With Two Necks public

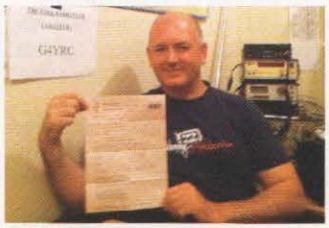
house in Wakefield, West Yorkshire. Thus, **Wakefield & DRS** was born. Now, some sixty-plus years later, W&DRS is still alive and vibrant.

Walter himself was guest of honour at the opening of the new W&DRS shack in June 2009. David Lockwood, G4CLI spent quite a while reminiscing with Walter about the 'old days' and all the members of W&DRS were fascinated by stories that Walter told. At the time, Walter seemed quite sprightly for an octogenarian and it was with great sadness that his friends heard of his death during 2010. Members suggested that the Society make every effort to obtain Walter's callsign for use by the club.

G4CLI embarked on the project to obtain the transfer that involved assistance by Nigel, G0BPK, Rob, G3XFD and Walter's son, Paul Farrar OBE, who graciously granted permission for the W&DRS to apply for the callsign transfer. Finally, in July, the project reached its conclusion when the reallocated licence from Ofcom arrived.

The Committee and Members of the Wakefield & DRS owe a debt of gratitude to Walter as, without his action sixty-plus years ago, W&DRS would not exist. The club propose to activate the callsign at its weekly meetings and on other occasions, such as its regular DXpeditions.

Kris Milone, now M0KOO, has recently passed the Advance exam on his first attempt at **York Radio Club**. Congratulations from the rest of the members.



2E0GHP and Julia, 2E0JMW recently passed the Intermediate exam held at **York ARS**. They are both are now studying hard for the Advanced exam.

REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, M0VRR, RM5@RSGB.ORG.UK

CHELTENHAM ARA
Derek Thom, G3NKS, 01242 241 099, chairman@caranet.co.uk
15 The 3-20 show
24 Weekend event: GB0GWR, Cheltenham Racecourse station

COVENTRY ARS
John, G8SEQ, 07958 777 363
2 Military radio pt 2: Ivan Thomas, M0IRT
9 4th round G2FDC Trophy
16 Committee forum
23 Video night
30 Radio workshop

GLOUCESTER AR&ES
Anne, 2E1GKY, 01452 548 478, daytime, www.g4aym.org.uk
5 AGM presentation of G4MA Trophy in Pat Perkins' name by his sons
12 HF operating/informal
19 VHF operating/workshop
26 Work Brian, G4CIB and Leta, G4RHK on Lundy on 80m

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
4 Visit to Telford Hamfest
7 Open night, OTA & training classes
14 Plan birthday exhibition, committee meeting & training
21 80th birthday final arrangements, talk in for GB80OTH
24 80th birthday exhibition at church hall, 10am to 4pm, see www.radioclubs.net/mars
28 Debrief and training classes

MID-WARWICKSHIRE ARS
Don, G4CYG, 01926 424 465
13 The switchover to digital TV
27 Computer topics, Dave, G8UIO

SALOP ARS
www.salop-ars.org.uk
1 Tabletop sale
8 Fox hunt
15 Calibration night & QRP rig walkthrough

SOUTH BIRMINGHAM RS
Don, 01214 581 603, www.radioclubs.net/southbirmingham
1, 8, 15, 22, 29 Training classes with Dave Murphy, G8OWL
2 Loading trailer for Telford Hamfest
4 Club stand at Telford Hamfest
5 Unpacking trailer, shack on the air
7 Lecture in the main hall
9, 16, 23, 30 Construction evening
12 Shack painting and renovation
19 Committee meeting
24 Visit to the MARS 80th Birthday exhibition
26 Field Day planning meeting, open night
30 Visit to National Hamfest, Newark

SUTTON COLDFIELD ARS
Robert Bird, spirit.guide@hotmail.co.uk
12, 26 General meeting, OTA, Morse

TELFORD & DARS
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@blueyonder.co.uk
4 TDARS Hamfest
7 Committee meeting & HF/VHF OTA
14 Hamfest debrief, project ideas for winter
21 Treasure hunt with 2E0TRO
28 Projects for winter

WORCESTER RAA
Rich Moles, 2E0MOL, secretary@m0zoo.co.uk
4 Club trip to Telford rally
13 Talk on Colossus by Mike Ferriday
27 Construction night: high altitude balloon

Sunday 3 April saw the **South Glos Rally** team assembled ready to welcome traders and customers. There was more than 80 tables to place in 6 separate locations, signs to be located around the site, and banners to be assembled, so it was full steam ahead. By 9am most of the traders were in place, some car booters were already enjoying coffee and bacon rolls – and even a few customers were trying to bribe the gatekeeper to let them in early. Traders in attendance this year were QSL Communications, Sandpiper Aerials, Snowdonia Radio, Henry Westlake, Camsecure, SDR Kits, Rigfix, Worsley Communications and Pro Whips. RSGB had a very busy bookstall too. RAIBC, G-QRP, Chepstow Radio Club, Trowbridge Radio Club, Avon Scouts Radio Club and Thornbury & South Glos Radio Club were all in attendance and seemed to be busy all day. There was also more than 17 private traders who all say they had a busy day. The usual Bring & Buy seemed to be inundated with ancient very heavy radio gear but did make quite a few customers happy with their purchases.

The organisers would like to thank The Scout Association who were responsible for the use the Woodhouse Site, Avon Scout Amateur Radio Club and Thornbury & South Glos Amateur Radio Club who were responsible for providing all the volunteer workforce that made the day seem so short. The fourth Rally is being planned for 1 April. The site has been booked for the day and a number of traders have already committed to attend. www.southglosradiorally.org.uk.

David, M6DDT (front right) recently passed his Foundation licence exam on his first attempt with **Gloucester AR&ES**, having been coached on a one-to-one basis by G3TDT (front left).

Worcester RAA wishes to congratulate the latest candidates who passed their Foundation exam and the one successful Intermediate exam pass. Tutored by Pete, G0WXJ, and assisted by a group of volunteers, the class enjoyed a relaxed and informative weekend. Five out of the six candidates on the Foundation course passed. One candidate who travelled over fifty miles sat and passed the Intermediate exam. Everyone in WRAA looks forward to hearing the shiny new callsigns up and down the bands. Keep an eye on their website for details of future courses.

From left to right: Andy, Richard Strong (Intermediate), Lee, Richard, Fred and Steve.

In June, Dean passed his Foundation exam with a score of 20. This might not sound like much, but Dean is only nine years old. Dean had his first QSO on 12 July with a local amateur. This is the youngest member of **Midland ARS** to pass the Foundation exam. One week later on 6 July, Dean's older brother, Jamie and his mum, Emma, passed the Intermediate exam, with flying colours. Pictured are Jamie, 2E0UKV, Dean, M6WMD and Emma, 2E0EJH.

In July, Mark Bally passed his Intermediate exam at **Midland ARS**. The photo shows tutor Jim, M1CPC and student Mark. Classes restart in September.

REGION 6: NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620 733
5 Junk sale
19 On the air

Mold and DARC would like to invite all radio amateurs and short wave listeners to a silent key, shack surplus, bring and buy, junk swap and sell evening to be held at 8pm in the Mold Rugby Club, Mold, in Flintshire, North Wales on Wednesday 14 September. What the club hopes will make this sale a little different is the quality of some of the silent key items in the sale, which includes an Elecraft K3 – and the fact that there is no charge for private sellers. Please contact Steve, GW7AAV on 01244 819 618 or e-mail gw7aav@gmail.com (correct on QRZ.com) in advance for a table reservation.

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
3 Across Wales walk
29 OTA with David, 2W0EDW (145.500 then 145.550)

REGION 8: NORTHERN IRELAND

REGIONAL REP: PETER LOWRIE, MI5JYK, RM8@RSGB.ORG.UK

GREENISLAND ELECTRONICS AMATEUR RADIO SOCIETY
Peter Lowrie, MI5JYK, mi5jyk@rsgb.org.uk
12 On the air, 2m

MID ULSTER ARC
cqmuarc@gmail.com
3 Weekend event: NI International Airshow, Portrush
9 Foundation course and exam over the weekend

Bangor & District ARS laid on a special welcome for their guests of honour at the club's annual rally on 2 July. Publius Cordina, 9H5PC and his wife, Bernadette, had flown into Northern Ireland from Malta to combine a short holiday with a visit to the rally. This came about following regular 'skeds' between Publius and club committee member Bertie, GI4POC over the past couple of years. The visitors were not only greeted by applause, but by a huge banner stretched across the wall. Pictured are Publius and his wife with club chairman Mike, GI4XSF, in the centre.

Like most clubs throughout the UK, **Greenisland Electronics ARS** does the odd contest from time to time – a great opportunity to get the members out in the fresh air for a weekend. Their main theatre of contesting was HF and primarily IOTA using the old contest call of MI6X. This year, however, GEARS decided to boldly go where the club has never been before –VHF National Field Day.

Although the club was venturing into uncharted waters, in its ranks are several experienced HF contesters, portable operators, DXpeditioners and some with VHF contesting success, so the task was made much easier. The club also has some very enthusiastic newly licenced MI6s so this would be a great training exercise for them and an introduction to contesting.

Proper planning and preparation is vital to any contest and poor planning leads to poor performance. So, taking that mantra to heart, they ran a few classes on logging for the members prior to the contest and settled on the Minos logging software due to its ease of use. Lessons on operating and QRA squares also took up a few club nights and by VHF NFD everyone was proficient to a high standard and the new MI6s proved this on 70cm during NFD.

The initial idea was to be active on 6, 4, 2, 70cm and 3cm but, due to circumstances beyond their control, they had to shelve the 1296MHz station. Jim, GI1CET was left to the design of the remaining four stations and the planning of antennas. It was Jim who first mooted the idea of using software defined radios for the 6, 4 & 2m stations. This was a big step as most of the club don't use SDR systems and there was one major sceptic within the club to this, although he became a convert to the concept very quickly after using it.

The club researched the high spots of south east County Antrim before settling on a coastal location at The Gobbins on Islandmagee, which in reality isn't an island but actually a peninsula. This site had been used with great success in the past by a club member in the RSGB's Backpacker contest. When the weekend of NFD arrived, everything fell into place with perfect weather and a very professional logistics operation to erect masts, build and mount antennas, arrange stations all in good time prior to the start of the contest.

Good propagation didn't really materialise on Saturday for the 6m section although they did work some stations outside of the UK on this band, 2 and 70 were making contacts although it was slow at times on these bands too. Sunday brought a bit more activity on 2m and they broke the 200 QSO mark with ease and made a few contacts in to PA for some nice big points. PA was even worked on 70cm, which was the icing on the cake for that band and for the clubs newly licensed Mi6's who ran this station for most of the contest. 4m operating was a new venture for many of those GEARS members on site and the station made numerous contacts on SSB, CW and FM.

Plans are afoot for a bigger and better station for 2012 with the club investing in better antennas, 48 elements is the benchmark on 2m and long Yagis for 4 and 6m, plus better Tx/Rx on 4m. The new MI6s who took part certainly have got bitten by the contesting bug and the club haven't even told them about HF contesting (yet).

Photos by David, GI4FUM

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

BROMLEY & DARS
Andy, G4WGZ, 01689 878 089
20 5MHz Experiment data analysis

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
5 2m fox hunt

CHESHAM & DARS
Terry, G0VFW, 01442 831 491, cdars.club@ntlworld.com
7 General meeting & CW training session
14 Members' forum – bring your radio equipment
21 Aerial design principles, Roger, G3MEH
28 On the air & CW practice

COULSDON ATS
Steve Beal G3WZK, secretary@catsradio.org
12 Equipment sale

CRAY VALLEY RS
Bob, M0MCV, 02082 657 735 after 8pm
1 Homebrew by Richard, G8ITB
15 Pre-expedition to Christmas Island, Nobby Styles, G0VJG

CRYSTAL PALACE R&EC
Bob, G3OOU, 01737 552 170, g3oou@aol.com
2 Junk box aerials, Martin Butler, M1MRB

DORKING & DRS
Garth, G3NPC, 01737 359 472, www.ddrs.org.uk
27 The STEPP-IR antenna, Rob Barter, M0ZAF

EDGWARE & DRS
Mike, G4RNW, 02089 500 658, michael.stewart5@ntlworld.com
8 Map and atlas evening
22 Scientific instruments evening

NEWBURY & DARS
Rob, G3LMW, 01635 862 737, g4lmw@btconnect.com
3 SSB Field Day
28 The effect of solar activity on radio propagation – Dr Lucie Green

RADIO SOCIETY OF HARROW
Linda, G7RJL, 02083 868 586, www.g3efx.org.uk
10 Working amateur satellites (Old Redding, 2pm)
23 Demo of Rig Blaster Pro interface

SHEFFORD & DARS
David, G8UOD, 01234 742 757, www.sadars.co.uk
15 Where would we be without wireless? David, G8UOD
22 Radio control, Tony Dalton

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
14 The great ERG race

SURREY RADIO CONTACT CLUB
John, G3MCX, 02086 883 322, john.g3mcx@btinternet.com
5 Fox hunting by Terry Giles, G4CDY
19 Fix-it, advice, chinwag & move-it-on

SUTTON & CHEAM RS
John, G0BWV, 02086 449 945, info@scrs.org.uk
15 Repairing vintage radios by Dave Smith, G0SXD

VERULAM ARC
Tony, 2E0WAP, 01727 853 087
1 Social with GB3VH group, 7.30, Queens Head, Sandridge
20 The MKARS80 80m transceiver by Steve, G6ALU

WEY VALLEY ARG
www.weyvalleyarg.org.uk
2 Andy Talbot, G4JNT
16 Roger Ballister, G3KMA

WIMBLEDON & DARS
Andrew Maish G4ADM, 02083 353 434
9 Summer camp retrospective
30 QRP and the FOXX-3 kit by Eric, G0KRT

The next Foundation training course run by **Crystal Palace R&EC** will take place on four Saturday mornings – 24 September, 1, 8 and 15 October, with the revision session and exam on 22 October. Contact Bob on 01737 552170 or by e-mail to g3oou@aol.com for more information or to join the course.

YOUR RSGB
SUPPORTING YOUR CLUB

John Breen, 2E0XZL now has the Full callsign of M0XZL. He was on the training course run by **Bedford & District ARC**. Over the past few years, members of the Club have run a number of special event stations, contests and club night operating. John has operated at the special events that they held at Bromham Mill supporting Mills on the Air and also the Club's special event in support of Ravensden Village Fete, special callsign GB0RVF.

REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

BREDE STEAM ARS
Steve, 01424 720815, M0NUC@aol.com
3, 6, 13, 20, 27 At the shack

CRAWLEY ARC
John, G3VLH, 01342 714 402
11 Microwave Round Table - visitors welcome
28 The new breed of computer-based test instruments

HARWELL ARS
Malcolm, G8NRP, 01235 524 844, info@g3pia.org.uk
13 Club meeting
24 Open day
27 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909, www.herc.uk.net
28 Baird revisited, John, G0MTJ

HORNDEAN & DARC
Stuart, G0FYX, 02392 472 846, www.hdarc.co.uk
1 Natter night/social evening
15 Club members' 15-minute talks

HORSHAM ARC
www.harc.org.uk
1 RF transmitters & other experiences, Tony Crake
15 The Dun Horse, Mannings Heath

MID-SUSSEX ARS
Peter, G4AKG, 01444 239 371
2, 16 Radio night and table top sale
9, 23 Radio Night
30 Home construction by Tony, G3NPF

SOUTHDOWN ARS
John, G3DQY, 01424 424 319
5 At Chaseley; arrangements re RCN/SARS visit
7 Operating at Hailsham shack
9 SARS/RCN Twinning weekend

SWINDON & DARC
Den, M0ACM, 07810 317 750, www.sdarc.net
1 Activity night & prep for HF SSB contest
8 20 days to T32C, Tony, G4LDL
15, 29 Activity night
22 Talk

TROWBRIDGE & DARC
Ian, G0GRI, 01225 864 698, E/W
7 VNA analysis with G0BBL
21 Natter night

After several Foundation courses, **Harwell ARS** G3PIA held its first Intermediate course and exam earlier this year and are pleased to report a 100% pass rate. The course was held at the Rutherford Appleton Laboratory Social Club at Chilton, South Oxfordshire. The construction project was well received as a useful instrument for measuring SWR. Thanks to the instructors Richard, G0REL; Ron, G7DOE and Tony, G7ETW for all their hard work.

The photograph shows (from left to right): Steve, 2E0GDH; Paul, 2E0MPX; Tony, G7ETW (instructor); Anne, 2E0CFH; Ron, G7DOE (instructor); Marian, 2E0LNU; Martin, 2E0CFI and Chris, 2E0CKF.

REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473 251
10 Arlington Court special event station
19 Antenna basics by Terry, G4CHD

BRISTOL RSGB GROUP
Robin, G3TKF, 01225 420 442
26 Talk by government historian Mike

EXETER ARS
Nick, M6NRJ, 01363 775 756, info@exeterars.co.uk
12, 26 Club night at the Moose Centre

MID SOMERSET ARC
Nick, M6NJB, 01749 346 320, nick.bennett@midsarc.org.uk
13 Radio aurora by Graham Kimbell, G3TCT

NORTH BRISTOL ARC
Dick, 01454 218 362, www.nbarc.org.uk
2 Construction evening
9 Repeaters, Dr Tony Hawker, G4CJZ
16 On the air
23 Relax and chat
30 Committee meeting

PLYMOUTH RC
Chris, M0ZCP, 07834 767 161, chrisparker33@hotmail.com
13 APRS by Stuart

SOUTH BRISTOL ARC
Andrew Jenner, G7KNA, 07838 695 471
1 PSK demonstration
3 GB2BLE departure
8 Contact GB2BLE (Lundy Island)
10 GB2BLE return
15 Views of Lundy
22 ROTA briefing
24 Weekend event: Railways on the Air
29 On the air

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
3 Weekend event: RSGB NFD

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
7 Installation of the Stepp-IR, Rob, G0WSC & Kelvin, M0AID

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
2 Natter night
9 Pre rally meeting
16 Post rally wash-up meeting

WEST DEVON RC
Jules Cuddy, M1AGY, 01752 291 588
6 Natter night and club visits
20 VMARS evening, Tony Helm, G4BCX

YEOVIL ARC
Steve Crask, G7AHP, steve@g7ahp.co.uk
1 HF, 6m & 4m portable solutions
8 Building project 1, G3PCJ
15 Building project 2, G3PCJ
22 Members' mini talks

With the results of the June Advanced rolling in (all passes so far) it is time for the **Bath Radio Classes** to start looking forward to next 'term'. Are there any would-be amateurs out there that need a Foundation course? The Bath team plan to start again in September at Foundation level with a six week course on Thursday evenings 7-9pm. Intermediate classes are planned to run from October with a Buildathon for the project and the exam in January. Advanced classes will the run from January to the June exam, hopefully with distance learning in parallel. Last year the Bath team also ran a 10-week Morse class from September and can do so again if anyone is up for some key bashing. All of these classes are 'demand-led' so please pass on the details and ask any prospective students to get in touch so the Bath team can gauge how many are waiting in the wings. For more details, contact Steve Hartley, G0FUW via e-mail to G0FUW@tiscali.co.uk; Steve is QTHR in the *Yearbook* and on QRZ.com. Classes are run with the kind support of the City of Bristol RSGB Group.

In July, **Shirehampton ARC** had three successful candidates pass their Intermediate exam. All students have indicated that they would like to go on to complete the Advanced Level as soon as possible. Left to right are Clive, G4NAQ, (invigilator), Dan, M6ATV, Andy, M6NOX and Martin, M6GXO. Shirehampton ARC has had a steady stream of successful candidates since the inception of the scheme set up by the RSGB, not huge classes but they all add up.

Torbay ARS has arranged a talk for 26 August by Roger Western, G3SXW speaking on Radio in Far Away Places. Contact Dave, G6FSP by e-mail to g6fsp@tars.org.uk for more details.

REGION 12: EAST & EAST ANGLIA

REGIONAL REP: MARK SANDERSON, M0IEO, RM12@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404 154, secretary@bittern-dxers.org.uk
3 Weekend event: SSB Field Day
8 Informal meeting at Pinewood Park Leisure Club
11 Ingworth Trosh
24 Weekend event: GB2NNR, Railways OTA, Holt, Norfolk
29 Club meeting at Pinewood Park Leisure Club

BRAINTREE & DARS
John, M5AJB, 01787 460 947
5 Sale of unwanted items, for BWFTB
19 Talk on astronomy by Mike Adcock, G8DJO

CAMBRIDGE & DARC
Ron, G3KBR, 01223 501 712
9 Debugging the SoftRock II Lite SDR, Mike, M0BLP
23 Making traps for multi band aerials, Ron, G3KBR

CHELMSFORD ARS
Martyn, G1EFL, 01245 469 008, www.g0mwt.org.uk
1 Foundation Course starts, Danbury Village Hall
6 Programming modern VHF/UHF rigs by CARS members
13, 20, 27 Club net
14 Committee meeting, Danbury Village Hall

COALHOUSE FORT ARS
John Parker, M1DUC, coalhouserad1o@yahoo.com
25 Open day

COLCHESTER RADIO AMATEURS
Kevan, 2E0WMG, 07766 543784, kevan2e0wmg@live.co.uk
22 Scrapheap challenge, Matt, 2E0XIS

FELIXTOWE & DARS
Paul, G4YQC, pjw@btinternet.com
5 Club net, 145.400MHz, 8pm
19 ESWR post mortem

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC, 02085 021 645
3 Autumn get-together, Aylmers Farm, Old Harlow

LOWESTOFT & DISTRICT PYE ARC
Lee, 2E1LJL, 01502 564 242, leejlewis@hotmail.co.uk
1, 8, 15, 22, 29 Club night at shack
3 Club night at shack; SSB Field Day
17 Grand Henham Steam Rally, Southwold

NORFOLK ARC
Chris Danby, G0DWV, 01603 898 678, cmdanby@btinternet.com
3 Weekend event: Norfolk Gala Day
7 Practical Wireless by the editor, Rob Mannion
14 Informal / construction / shack / RSGB Club Sprint SSB contest
23 Weekend event: Railways on the Air
28 Informal / construction / shack / Bright Sparks
29 RSGB 80m Club Sprint CW contest

SOUTH ESSEX ARS
Dave, G4UVJ. 01268 697 978, secretary@southessex-ars.co.uk
14 Homebrew Antennas by Dave, G4UVJ

WEST KENT ARS
Keith G4JED, westkentars@googlemail.com
12 Club meeting night

Norfolk ARC recently held two radio super raffle events with the prizes kindly donates by various amateur radio companies, including the RSGB. All monies and donations have been counted and the club raised a total of £894, which will be split equally between Cancer Research UK and the Big C appeal! Members and visitors to events such as RadioActive have been very generous buying so many raffle tickets.

Since Christmas, Dave G4HUP, who lectures in Engineering at **West Suffolk College** has been offering optional enrichment to the mainstream engineering BTEC courses by way of the RCF Amateur Radio exams. At the end of the academic year there are now 11 new Foundation licensees. The response from the students has been much greater than anticipated, needing four separate groups to meet all of the students timetable obligations, as well as giving enough individual support for the practical activities and assessments.

In addition to the students, many of the engineering staff also requested to take the course, so during some professional development time in early June they were put through a two day Foundation course as well. Having the staff involved provides good example to the students, and they are expecting a good take-up next year, as well as seeing some of this years licensees progressing to Intermediate and beyond.

The Foundation and higher licence courses are an extremely good fit alongside the more formal BTEC National Diploma and Certificate courses in Engineering, and provide scope for reinforcement of some of the technical material as well as enrichment and further development.

From left: George, M6ATL, Adam, M6ATO, Tom, M6AUP, Sean, M6AUB, Jack, M6ATN, Dave, G4HUP, instructor, Peter, M6AUQ and Miles.

West Suffolk College engineering students following their Foundation Exam success in April.

ICOM

IC-7410

An Even Greater Choice!

ICOM proudly announce the IC-7410, designed as a specialised HF/50MHz transceiver that sports excellent performance and features. The IC-7410 employs a high-grade DSP unit and double-conversion super-heterodyne system developed from the very latest technology found in higher grade ICOM rigs including the IC-7800, IC-7700 and IC-7600. In addition, the IC-7410 has a built-in 15kHz 1st IF filter that accepts up to two optional filters (3kHz~6kHz). When operated with these 1st IF filters, narrow mode signals such as the CW and SSB modes are automatically protected from adjacent and unwanted strong signal interference.

IC-7410 features include:

- +30dBm 3rd order intercept point (in 14MHz band)
- Double-conversion super-heterodyne system to improve in-band IMD
- 32-bit floating-point DSP unit
- 15kHz first IF filter and optional 3kHz and 6kHz first IF filters
- Large monochrome LCD display
- ±0.5ppm frequency stability
- Simple band scope
- Automatic antenna tuner
- All-mode (SSB/CW/RTTY/AM/FM)
- USB connector for PC control
- Voice synthesizer announces operating frequency, mode and S-meter level (switchable)
- User-programmable band edge beep (switchable)
- Microphone equalizer and adjustable transmit bandwidth

First Class Features and Powerful Performance...

ICOM-UK Blacksole House, Altira Park, Herne Bay, Kent CT6 6GZ.
Telephone: 01227 741741 Fax: 01227 741742 e-mail: sales@icomuk.co.uk website: www.icomuk.co.uk

Count on us!

From left: Ben, M6AWI, Manish, M6AXM, Dave, G4HUP instructor, Chris, M6AWN (seated), Mick, M6AWL, Jon, M6AWY, Phil, M6AWQ, Adam, M6FAK, Luc, M6LMJ and Keeva, M6KNW.

For **Bittern DX Group**, VHF Field day was great success from a different site overlooking the sea – a good take-off. The equipment was sorted by Alec, G3YOA and Roy, G1NGE had renovated the 17 element Tonna. The club had a cracking operating team made up of old hands and new licensees. Site manager Steve, G7VRK and lead operator Linda, G0AJJ felt it was a great piece of teamwork, especially with Peter's now famous triple decker cholesterol breakfast!

Later, Banningham village fete was a useful outing for the group. Little radio activity, but a chance to try out the club's new kids radio games. A radio version of 'pairs', identification of radio, bits and a game called 'antennas and earthleads' which looks a bit like snakes and ladders. If your club is interested in these 'games' you can get details from Robin, G0SIQ.

Linda, G0AJJ at work during VHF Field Day

Both **Mid Sussex Amateur Radio Society** and **Chelmsford Amateur Radio Society** commemorated the centenary of the birth of Louis Varney, G5RV during June this year. CARS devoted their June monthly meeting to the memory of G5RV and started by playing a DVD of a lecture Louis Varney, G5RV gave to the Norfolk Amateur Radio Society in 1990 that was obtained by Trevor, M5AKA from Mike, G4DYC and turned into a DVD by Robert, G4TUK.

CARS Life Fellow, Harry Heap, G5HF then presented a personal story of Louis – both their sons grew up together; both called Peter. Louis was born on 9 June 1911. He made his first crystal set when he was 11, obtained his Artificial Aerial licence in 1922 as 2ARV and his full amateur licence in 1929. He joined Marconi's in Chelmsford in 1936 and founded the Chelmsford RSGB Group; now call the Chelmsford Amateur Radio Society in the same year.

He joined the Army in 1942 as a 2Lt in the Royal Signals, associated with MI6, SCU3 DF where he was responsible for setting up, maintenance and calibration of the DF network – soon promoted to Captain. Two years before he died he confided in Harry that he was a Secret Listener and that he held an amateur radio callsign during the War (being one of only 7 to do so).

Harry played a taped account recorded by John MaCafferty of what it was like staffing a DF Hut and his involvement with Louis. Brian Thwaites, G3CVI then described how with Jack Ridley (later VE3DLR) he assisted Louis with the development of his famous aerial – before it was a published design. In 1946 Louis produced his famous G5RV aerial and in 1952 designed the Elizabethan Transmitter.

Harry showed a photograph taken by Louis's wife, Nelida in Louis's back garden in 1990 in Burgess Hill, Sussex. He is seen holding his 1927 Colpitts Oscillator TX, which gave out 4W CW. The valve is mounted upside-down at the rear without a valve base. This TX was used post-WWII by Louis on Field Days with an HRO receiver in Chelmsford. In his 1980s he fell out of the tree behind him while pruning it. He was a member of the RSGB for 74 years.

Louis died on 28 June 2000, aged 89 with Harry, G5HF being one of the last people to work him. On that same day the halyard of his G5RV aerial at his house in Burgess Hill parted; the distant end of the aerial fell down to rest at half-mast.

Andy Tyler, G1GKN then projected a number of computer produced aerial plots of the G5RV aerial. It basically radiates – but is never used by professionals! CARS aerial expert Tony Gilbey, G4YTG then echoed the results Andy had produced. Gwyn Williams, G4FKH & Patrick, M0XAP gave their experience using G5RV aerials at home.

CARS President projected beautiful diagrams of the Elizabethan Transmitter that Louis designed. Louis published the design in RSGB Bulletin in December1951/January1952 for a 75 watt TVI proof transmitter. The July 1953 *Bulletin* contained the 150 watt transmitter; this was an upgrade to the previous 75 watt TX and was CW only. An Elizabethan TX built in 1952 by CARS Member Dave Bolwell as G3JCM was on display together with his Log Book from those days.

To finish off the evening Colin, G0TRM produced a PowerPoint Presentation of his G5RV aerial and a number of excellent photographs of Louis including. A superb evening. Recently, **Braintree ARC** set up their station for the Mills on the Air event at Bocking Windmill, Bocking, Essex. Situated two miles from the town of Braintree, this former working postmill was built around 1721, then dismantled in the 1830s and moved further up the hill. It was restored in 1994 and there is a society known as The Friends of Bocking Windmill that continue its preservation. It is one of the few Grade 1 listed windmills in Essex and is complete both internally and externally.

The tented shack comprised of an Icom HF transceiver working into a full size Windom antenna and an Icom VHF transceiver connected to a Tri-Band VHF vertical antenna. The club operated under the special callsign GB2BWT. Despite the cold nights and poor HF band conditions during the course of the weekend the club made many HF and VHF/UHF contacts.

REGION 13: EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

DERBY & DARS
Richard Buckby, radio@dadars.org.uk
6 Junk sale
13 Committee meeting

DERBY RAYNET AMATEUR RADIO GROUP
Martin, G7MKS, contactus@derbyraynet.co.uk
5, 12, 19, 26 RAYNET duties

FRISKNEY AND EAST LINCOLNSHIRE COMMS CLUB
Chris M0MFP, 01507 442 240
6 Construction night + AGM

HINCKLEY ARS
John, M0JAV, 07836 731544 m0jav@lowgables.co.uk,
10 Churches on the Air, Mark, 2E0SBM
25 Railways on the Air, John, M0JAV

HUCKNALL ROLLS ROYCE ARC
Dave Wilde, G1YAI, 08444 355 593, secretary@hrrarc.com
2 10km fox hunt 19:15 GMT, Hucknall club car park
23 Talk by Steve Boden from the RSGB

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO, 01427 788 356, pamelagrose@tiscali.co.uk
2 SSB National Field Day set up
3 Weekend: event SSB NFD
7 G5FZ on the air; prep for National Hamfest
10 Saturday in the Shack & Saturday Surgery
14 G6COL on the air; prep for National Hamfest
17 Prep for National Hamfest
19 National Hamfest committee meeting
21 National Hamfest meeting
24 Prep for National Hamfest
26 National Hamfest meeting, Newark Showground
27, 28, 29 Preparations on site for National Hamfest
30 National Hamfest, Newark Showground

LOUGHBOROUGH & DARC
Chris, G1ETZ, 01509 504 319
6 Video evening, member's choice
13 Valve testing
20 Back to the 40's night, bring something along
27 Practical evening

SOUTH KESTEVEN AMATEUR RADIO SOCIETY
Nigel, M0CVO, 01476 402 550
7 Informal evening
21 Planning for trip to National Hamfest

WELLAND VALLEY ARS
Peter D Rivers, G4XEX, 01858 432 105, g4xex@fsmail.net
3 Weekend event: SSB Field Day, G4WVR/P
19 HF operating night

In May, Paul Dickson, became the first **South Kesteven ARS** Foundation trainee passing his test with a 100% score. He is now the proud holder of the callsign M6AVP. The instructor and other members of the club wish him much enjoyment in his new hobby. www.skars.webs.com.

As part of **Lincoln Short Wave Club's** 90th birthday activities, the club has donated a brand new FT-450AT to the radio station at the University of Addis Ababa in Ethiopia. The shack is housed in the Department of Electrical Engineering and is the HQ of the **Ethiopian Amateur Radio** Society. The donation came about after Sid May, G4CTQ, a former member of LSWC, contacted the Club to ask for donations of used equipment. Sid, who works for the University of Addis Ababa Electrical Engineering Department, has already managed to secure a redundant log periodic from the US embassy and installed it on the roof of the University. This should mean that even with only 100W they should put a good signal into the UK and most of the rest of the world. The station can are often be heard around 14.180 and 21.180MHz.

The authorities in Ethiopia, who licenced Sid as ET3SID, have given him the go-ahead to train some students so that they can apply for their own callsigns. They are all Electrical Engineering students at the University. To date 21 students have passed the International Amateur Radio Exam and more are following on. Now pressure is being put on the Ethiopian authorities to license the successful candidates. Representations are being made by the IARU to achieve this.

Students Sigi and Blen on the left and Amante and Aman on the right. All hope to gain their own licences soon.

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

13cm ANTENNA, 27-ele JVL loop antenna, £30. 9dB patch antenna, £18. Adrian, G4UVZ, 01823 421 751, adrianwhatmore248@btinternet.com (Taunton).

3 DOUBLE BEDROOM block built 11 year old bungalow on level ground, 750ft ASL, nr Tintagel, north Cornwall, £229,950. Trev Harris, G2KF, 07974 892 179.

4 DX BOOKS: *'Up Two'*, *'DX Delights'*, *'Contesting in Africa'*, *'Micro-DXpeditioning Uncovered'*, £9 each, signed by the author; email for details. PayPal or cheque to QTHR. Roger Western, G3SXW, 07836 612 972, g3sxw@btinternet.com (Chessington).

AOR-8600 mk 2, 2nd edition communications receiver, 100kHz-3GHz. 2 years old, in 1st class condition, complete with original box, packing, manual, DC lead and whip antenna. Not required now (recent transmit licence), £450 ONO. Mick, M6NRW, 01905 779 829 (Worcestershire).

bhi NES10-2 MKII noise eliminating speaker, as new and boxed. Offers? Plus carriage costs. Ray, G4OWY, 07909 383 475 after 6pm please, g4owy6@gmail.com (Weymouth).

BUTTERNUT HFV5-111 vertical with manual, £125. Chelcom three band Windom, 10m 20m, 40m, £25. Ameritron AV-620 vertical with manual, no radials required, £150. Liniplex F1 HF receiver, suspect audio fault, £65. G3DYM 10-160m trap dipole, £25. Buyer collects. Bernard, G3HWX, 01704 840 328 (Ormskirk, Lancs).

CUSHCRAFT 10-3CD SKYWALKER 10m 3-ele monoband Yagi. Excellent condition, with manual, £130. Buyer collects. David, G4ERW, 07501 239 762, david.lurcook@btinternet.com (Ashford, Kent).

FT-950, as new, 2 hrs use on Tx. Palstar PS-30M PSU, SignalLink USB, Diamond SX-2000 auto SWR/power meter, Kent straight key, CP6 antenna. £1,000 for quick sale. Reg, M0CIO, 01923 244 069, reg.wyatt@talktalk.net (Bushey, 1 mile from M1J5).

GALVANISED TENNAMAST. Winds up and down, will go up to thirty feet, has mounting brackets, £50 or best offer. Buyer will have to collect. Des, G3PTV, 01302 834208 (Doncaster).

HIGH SIERRA SIDEKICK mobile ant, 80-10m, £180. Diamond Tri-bander 627 (6/2/70cm) mobile ant, £50. bhi, 2 x NES 10-2 DSP, £45 each. bhi NEIM 1031 in-line module, £75. Gordon, M0GIQ, 01724 734 742 (Winteringham, N Lincs).

HOUSE IN RURAL FRANCE with 60 foot tower and multiple antennas. Full online at www.photomogg.co.uk. Shaun, GM4SIK, 0555 813 806 (Azat Chatenet, 23210 Creuse, Limousin, France).

ICOM IC-7400, faulty. Will not transmit. Receives perfectly. M De-Wynter, G1XGM, 07757 607 409, mde-wynter@live.com (Bradford).

ICOM IC-R9500 Rx, mint condition with original packaging, manuals etc, £6,000. Prefer buyer inspects & collects, otherwise carriage extra. Stuart, G4MIB, 01823 442 344, (QTHR, Taunton).

ILL-HEALTH QRT SALE. IC-7400 approx 4 years old, little use, collection only, £650. MFJ-204B 160/10 antenna bridge, £75. VSWR meter 1.8/200MHz 200W, £45. MFJ-1700B 6 equipments to 6 antenna switch. Comet 150W HF LPF, unused, £20. Collection/postage by arrangement. R Wiseman, G3PXV, 01526 833 455, eric@g3pxv.wanadoo.co.uk (Ruskington).

KENWOOD 850S, mic, manual, no box, nice, £380. KW-107 Supermatch/noise bridge, £70. One metre radio controlled yacht, new 2.4GHz radio control dx6, £95 complete. Collect only. Joe, G4MGX, 01234 741 330 (Bedford).

KENWOOD TS-430S complete with matching ATU, PSU, speaker, MC-60 mic, DM-81 dip meter, spare Yaesu 20A PSU. All in excellent condition, £750. Vintage TS-515 T/R, matching PSU & speaker, GWO. Offers. Many more items. Buyer collects. Moving QTH forces sale. Bob, GM0DZW, 01339 754 041 (Aberdeenshire).

KENWOOD TS-570DG, £400. MFJ-986 roller coaster differential T tuner, £125. LOKO PSU, V+I meters, £75. Vertical, multiband 1.8 to 28MHz antenna, 27ft in 3 sections, single wire feed, £140. VHF marine set LT59, complete with aerial, £130. All GWO. J Hudson, M0CMW, 0151 928 9419 (Liverpool).

LARGE DRUM OF RG58 coax, stranded core. Approx. 800m plus - continuous length. Sensible offers. Buyer collects, heavy item. Proceeds to go to Coping with Cancer. Chris Newman, G4JCJ, 01536 770 296, Chrisbertholduk@aol.com (Corby, Northants).

MICROWAVE MODULES MML-144/100S 2m 100W linear amp & preamp, £100. Diamond GZV2500 12V 25A PSU, £70. All plus postage. Graham, G3OHC, 01483 808 419, g3ohc@uksmg.net (Guildford).

MORSE CODE, RTTY super chip, crystal, disc & circuit diagrams. Build it, connect key, paddle, rig & transceiver Morse code, RTTY to a high level. Also optional speak board, built & tested, speaks all the functions of the system. V McClure, 01297 23421, 43 Roman Way, Seaton, Devon EX12 2NT.

MULTI ELEMENT Q.QUAD 6 to 20m HD FG spreaders, HD alum spider assembly, switching boxes, £350 ONO. Boom and spider to make a Q.Quad, offers. 80ft HD Versatower 16/20 series fitted with HD head unit, £2,000 ONO. Buyers collect. W Ginder, GW3NAS, 01454 581 180 (Ceredigion).

NATIONAL NC-400 classic 60s receiver. 18 valves, AM and SSB, 540kHz to 31MHz. Working, includes manual and filter housing (plug in) with two filters installed, £110. John Wood, G0PSI, 01169 460 670 (Nottingham).

PEAK PROGRAMME METER kit. To BBC spec, including a new ETI meter. Also transformers and the important parts. New cabinet, meter panel mounted. Specification and drawings, £30. Peter Pitts, G3GYE, 01736 362 486, ninapitts@talktalk.net (Penzance).

POPULAR WIRELESS – I have a 50+ copies of *Popular Wireless* and similar from the 1920s and 30s for sale in good condition, £3 each plus postage. Mike, 2E0MBN, tavyhayes@yahoo.com (Cornwall).

SHACK CLEARANCE. Large number of items including 4-ele 3 band Yagi, 2m quad (unused), Class D wavemeter, rotators, components, valves etc. SAE for complete list. Paul, G3FYF, 01364 631319 (Ashburton, Devon).

SILENT KEY SALE. Includes Icom IC-775DSP + PSU, IC-756 Pro + PSU, IC-7000, Yaesu FT-60E handheld, SG-230 SmartTuner, other ATUs and SWR meters. For details and prices contact Roger, GW4HSH, 01792 404 422 or Nick, MW0JGE, nick.lewis@btinternet.com (Swansea area).

TENNAMAST 14FT WITH TILT-OVER, 12in wall brackets, extended 25ft. Stub mast 8ft, total height approx 33ft. Yaesu G650C rotator, G550 elevation rotator, 19-ele 70cm and 9-el 2m antennas, fibreglass crosspole plus all cables/coax, £450. Carriage length 14ft. Malcolm Hall, G7NFO, 01788 573 534 (Rugby).

THE AMATEUR'S BOOK OF WIRELESS CIRCUITS by F H Haynes, 2nd ed, 1924. Hard covers, 128pp. Used condition, requires TLC. Suggest prospective buyer(s) view first before making an offer in writing (email etc). Stan Plumtree, G3OSP, 01785 240 379 (Stafford).

TS-2000X (boxed, near mint condx), £1,200. RigRunner with MP9600 PSU, £150. Daiwa SWR meters CN801S, CN801HP, CN101L, CN103L, with patch leads, £160 ONO. HM-404-2 Oscilloscope (mint), £150. Metex 9150 4 in 1 instrument, £150. Ian, M1IWB, 07906 238 227, ianblackburn14@virginmedia.com (Coventry).

YAESU FT-102 HF transceiver, good working order, £325. FRG-7700 general coverage receiver plus FRT-7700 matching ATU, £160 the pair. MD-1 desk mic, £75. Prefer buyer inspects and collects, or postage at cost. Michael, G4OCR, 01618 819 544, michael@bolton.ac.uk (Manchester).

WANTED

COLLINS KWM-380 transceiver. I am willing to pay top dollar and to collect in person. A good home will be provided. Steve Westell, G3YFG, 07793 665 000, g3yfg@btconnect.com (Clitheroe).

COLLINS TCS set of original AV mounts and connectors for Tx and Rx, also any other parts, however small, for own use. C Young, M0BGA, 01637 875 848 (Newquay).

COPY OF WIRELESS WORLD from late 1970s early 1980s with article or circuit diagram of 'High Impedance AC Millivoltmeter' that used ICs. Follow-up article added Resistance Measurement add-on unit. Copy of Panasonic VP-8120A FM/AM Signal Generator manual. Costs reimbursed. Bruce Hepburn, G8BGI, 01420 475 698 (Bordon, Hants).

DESPERATELY WANTED: manual or schematic for Frontier Electronics LA-2 2m linear amp. Any costs fully reimbursed. Ian, G4DPF, 07836 703 604, iain@g4dpf.co.uk (Cambridgeshire).

DRAKE 4 LINE transmitter 4B or 4C, with or without AC4. Cosmetics not important but must be in good working order. Vic Waddington, G4JSS, 01924 267 451 g4jss@tiscali.co.uk (Wakefield).

HELP WANTED to get my radios up and going. Fees paid. Need Denco Yellow transistor coils 2, 3 and 5. Looking for a copy of the 1951 *Radio Constructor* magazine with the first British transistor circuit. John Savage, G1IMQ, 01793 762 593, 27 Newbury House, Highworth, Swindon SN6 7DW.

LOOKING FOR ANY INFO, diagrams, manuals on W3MC-F3 TWT and PSU. Will cover any costs. John Randall, M0ELS, 07502 194 599 (Basildon).

OLD UK ROAD MAP/ATLAS, 1960s(?), showing disused airfields. Dick, 07779 450 557, rfixter@hotmail.com (Boston).

STRAIGHT SWAP: my Icom IC-7400 HF/VHF transceiver for an Icom IC-910H VHF/UHF transceiver. Lee, MW0LDJ, 07854 175 533 (Abergavenny).

WIRELESS SET (CDN) NO 58 manpack radio headgear assembly CDN type 20 with microphone DM-1. Stuart, M6AVC, 01619 282 636, shfur@tiscali.co.uk (Altrincham).

HELPLINE

Doug, G0LDJ is trying to discover any callsign that may have been allocated to Light Vessel 14. It was positioned at the estuary of the River Humber from 1959-1985 to delineate Spurn Bank/Point. The previous vessel, LV12, is now preserved at Hull docks and has the callsign GB0MMH. He is QTHR and would appreciate any help to point him in the right direction.

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

4 SEPTEMBER – TELFORD HAMFEST – Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF 433.200MHz. TS, SIG, discounted admission to Enginuity Centre. Details from Martyn, G3UKV, 01952 255 416 [www.telfordhamfest.co.uk].

10 SEPTEMBER – WARRINGTON COMMUNICATIONS MARKET – Warrington Indoor Market, Bank Street, Academy Way, WA1 2EN. OT 10am, multi-storey CP nearby. Free entry to event. Cafes in market. Trade stands available from £10 per table. Free parking below venue for traders. Details from Patrick on 07581 545 671 or marketfairs@hotmail.co.uk.

11 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 by e-mail to rally@tars.org.uk.

14 SEPTEMBER – MOLD & DRC NORTH WALES SWOP & SELL – Mold Rugby Club, Mold, Flintshire, North Wales. Ssilent key, shack surplus, bring and buy, junk swap and sell evening. OT 8pm. No charge for private sellers. Steve, GW7AAV on 01244 819 618, gw7aav@gmail.com (correct on QRZ.com) for table reservations.

17 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. £2, OT 10.30. Nancy Bone, G7UUR, 01914 770 036 (eves), nancybone2001@yahoo.co.uk [www.anarc.net].

18 SEPTEMBER – 21st GREAT NORTHERN HAMFEST – Metrodome Leisure Complex, Barnsley S71 1AN. OT 11.00, DF, TS, SIG, LB, C, FAM. Ernie, G4LUE, 01226 716 339 [www.greatnorthernhamfest.co.uk].

18 SEPTEMBER – BELGIUM AMATEUR RADIO & COMPUTER RALLY – Hall 'Lotto Mons Expo', Mons, 50km south of Brussels, access direct from motorway. OT 09.00, TI via repeaters 145.600MHz & 430.325MHz. 4000m², international TS, FM. Details Michel, ON7FI, on int'l +32 64 849 596, michel.dewyngaert@skynet.be [www.on6ll.be].

23 OCTOBER – CALLINGTON AMATEUR RADIO SOCIETY RALLY – Callington Community College, Launceston Road, Callington, Cornwall PL17 7DR. TI, CP, OT 10am, £2, TS, B&B, C, DF, WIN. Contact Chris G7UDX, 07973 418 371, g7udx@me.com.

30 SEPTEMBER & 1 OCTOBER – NATIONAL HAMFEST – brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). TS, B&B, CB, C, SIG, Morse proficiency tests on demand, RSGB Bookstall, RSGB Services & Committees, DF, FM [www.nationalhamfest.org.uk].

7-9 OCTOBER – RSGB CONVENTION – Horwood House, Little Horwood, near Milton Keynes. Full convention programme with lectures for all interests and all levels of technicality [www.rsgb.org/rsgbconvention].

9 OCTOBER – AUTUMN MILITARIA & ELECTRONICS & RADIO AMATEUR HANGAR SALE – Hack Green Secret Nuclear Bunker, Nantwich, Cheshire, CW5 8AL. OT 10.00, £2.50, civil, military and vintage radio equipment plus vehicle spares and more. Contact Rod Siebert, 01270 623 353 or coldwatr@hackgreen.co.uk [www.hackgreen.co.uk].

16 OCTOBER – BLACKWOOD AND DISTRICT ARS RALLY – Coleg Gwent, Risca Road, Cross Keys NP11 7ZA. TI V44 (S22), CP, OT 10.30/10.40, £2. TS, B&B, SIG, C, WIN. Dave, GW4HBK, 01495 228 516, gw4hbk@talktalk.net [www.gw6gw.co.uk].

16 OCTOBER – HORNSEA AMATEUR RADIO CLUB RALLY – Floral Hall, 7 The Esplanade, Hornsea, East Yorks HU18 1NQ. OT 10.30, CP, TS, B&B, SIG, RSGB, RAFARS, LB, C, DF, WIN. Details from Rick, M0CZR, R106221@aol.com [www.hornseaarc.co.uk].

23 OCTOBER – GALASHIELS AND DISTRICT ARS RADIO RALLY – The Volunteer Hall, St Johns Street, Galashiels, Scottish Borders TD1 3JX. OT 11.30/11.15, £2.50. B&B, TS, C, WIN. Details from Jim, GM7LUN on 01896 850 245 or mail@gm7lun.co.uk.

23 OCTOBER – CALLINGTON AMATEUR RADIO SOCIETY RALLY – Callington Community College, Launceston Road,Callington, Cornwall PL17 7DR. TI, CP, OT, 10am, £2, TS, B&B, C, DF, WIN. Contact John G4PBN, 01822 835 834, lumley85-cars@yahoo.co.uk

29 & 30 OCTOBER – NORTH WALES RALLY – John Bright School, Llandudno LL30 1LF. 10am – 4pm, TS, B&B, CP, DF. Details from Liz Cabban, GW0ETU on 01690 710 257 or lizcabban@vodafoneemail.co.uk.

30 OCTOBER – HOLSWORTHY AMATEUR RADIO RALLY – Holsworthy Community College, Victoria Hill, Holsworthy EX22 6JD. Roger Williams, 07773 983 691, email gsowter@talktalk.net.

6 NOVEMBER – WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally) – Kempton Park racecourse, Staines Road East, Sunbury on Thames, Middlesex TW16 5AQ. OT 10.00. TS, FM, DF, free CP, RSGB, LEC, TI S22 (V44). Paul, M0CJX, 08451 650 351, info@radiofairs.co.uk [www.radiofairs.co.uk].

12 NOVEMBER – ROCHDALE & DISTRICT RS TRADITIONAL RADIO RALLY – St Vincent's Church Hall, Caldershaw Road, Rochdale OL12 7QL. NB This is a Saturday rally. OT 10.15/10.30am, £2.50, concessions for U12 and seniors. B&B, C. Dave, G0PUD, QTHR, 07710 243 107, e-mail dave.shaw1@sky.com. [www.radars.me.uk].

20 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.

20 NOVEMBER – PLYMOUTH RADIO CLUB RALLY – Elm Community Centre, Leypark Walk, Estover, Plymouth PL6 8UE. CP, TI, OT 10.00, £2, TS, B&B, C, WIN. Bob Griffiths, G7HNB, 017523 431 277, freebobx@yahoo.com.

20 NOVEMBER – MAYO RADIO EXPERIMENTERS NETWORK CLUB RADIO RALLY – Welcome Inn Hotel, Castlebar. OT 11am. Padraic Baynes, EI9JA, +353 (0) 876 957 154, pbaynes1@eircom.net.

4 DECEMBER – BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY – Spennymoor Leisure Centre, Co Durham DL16 6DB. CP, TI S22 (V44), OT 10.15/10.30, £1.50 (U14 free). TS, B&B, C, LB, DF, FAM. Details from Mark, G0GFG, 01388 747 497.

2012

15 JANUARY – RED ROSE WINTER RALLY – George H Carnall Leisure Centre, Kingsway Park, M41 7FJ (easily accessible from Jct 9 of the M60 opposite the Trafford Centre). Free CP, B&B, C, LB, OT 11am, TS, SIG, DF, RSGB bookstall. Details from Steve, 07502 295 141 [www.wmrc.org.uk].

SILENT KEYS

We regret to record the passing of the following members:

Mr J A H Ogilby, GI0GQA	1/2011
Mr D H F Blowers, G0MBF	2/7/2011
Mr E Simons, G0PAQ	23/7/2011
Mr F Badman, G1NVG	12/2010
Mr M J Saunders, G1RNP	11/7/2011
Mr D R Martin, G1ZIU	27/7/2011
Mr F J Gregory BEM, G3AQM	
Mr G W Ripley, GD3AHV	11/5/2011
Mr R R Flaum, G3BDH	10/2010
Mr F H Hatt, G3CPH	19/7/2011
Mr J Wilmot, G3EHP	1/7/2011
Mr H F Lewis, G3GIQ	5/7/2011
Mr G F Gearing, G3JJG	2011
Mr W E Robinson, G3LTV	29/5/2011
Mr J F Coggins, G3TFC	2011
Mr J G Evans, G3WET	
Mr E Tredgold, G3XWI	23/7/2011
Mr L L Collis, GM4GJP	7/2011
Mr B J Butcher, G4HKG	2011
Mr B R Southwell, G4VTY	
Mr P A Gibbons, G6MRT	13/6/2011
Mr J E Arregger, M0ARR	16/6/2011
Mr J C Watson, VE3EZP	4/12/2010

This list shows all rallies and events we are aware of as at 9 August 2011. If your rally or event is not listed, TELL US ABOUT IT! Send an e-mail to GB2RS@RSGB.org.uk and your event will appear here and on GB2RS. It's free! Guidelines for submissions: Please let us know your event details as early as possible. If you submit by e-mail (to GB2RS@RSGB.org.uk) then we suggest you set your e-mail program to request a 'read' receipt so you can be sure we've seen the details.

TI Talk-In; CP Car Park; £ Admission; OT Opening time - time for disabled visitors appears first, (eg 10.30/11am); TS Trade Stands; FM Flea Market; CBS Car Boot Sale; B&B Bring and Buy; A Auction; SIG Special Interest Groups; MT Morse tests; MA Foundation Morse Assessments; LB Licensed Bar; C Catering; DF Disabled Facilities; WIN prize draw, raffle; LEC Lectures/Seminars; FAM Family attractions; CS Camp Site.

SPECIAL EVENT STATIONS FOR SEPTEMBER 2011

These callsigns are valid for use from the date given, but the period of operation may vary from 1 - 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and/or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet. Details published here are kindly provided by Ofcom.

Those running Special Event stations who wish to receive QSLs via the Bureau are reminded that they should lodge sufficient envelopes with the GB series manager Davina Williams, M0LXT, 20 Neale Close, Wollaston, Northamptonshire NN29 7UT. There is NO VIA SYSTEM (nor has there ever been) - you MUST send stamped SAEs to M0LXT to receive your Special Event QSLs.

Date	Callsign	Phonetics	Location	Bands	Keeper
01/08/2011	GB0YD	Yorkshire Day	Pontefract	TLH27	G5VZ
	GB0OSG	Oakley Scout Group	Basingstoke	LH	G8PLL
	GB4BPL	Burry Port Lighthouse	Wales	TLHV2	G3CEN
06/08/2011	GB4HRC	Havering Radio Club	Brentwood	LHV27	M0TAZ
	GB5OLR	Loughton & Epping Forest	Essex	LHV27	G0TOC
	GB2CWM	Cold War Museum	Suffolk	LH	G4XVE
12/08/2011	GB2HQB	Harrowbeer Q B (War time callsign)	Devon	TLV	G4BCX
	GB2PPS	Papplewick Pumping Station	Nottinghamshire	LH2	G0UYQ
15/08/2011	GB4CL	Cromer Lighthouse	Norfolk	LHV27	G7FSI
19/08/2011	GB4QE	Queen Elizabeth	Essex	TLHV2	M0ZZO
	GB1OL	Orkney Lighthouses	Orkney	TLHV27	MM5DWW
	GB0YAA	Yorkshire Air Ambulance	North Yorkshire	LHV2	G0SNV
	GB8SL	Shoreham Lighthouse	West Sussex	LHV2	G4LKW
	GB2SFL	South Foreland Lighthouse	Dover	TLHV27	G0KOK
	GB0NHL	Noss Head Lighthouse	Caithness	LHV2	GM4JYB
	GB2TCL	Thorngumbald Clough Lighthouse	Paull nr Hull	TLHV2	G7LRR
20/08/2011	GB2LBN	Lighthouse Barns Ness	East Lothian	LH	GM4UYZ
	GB2FL	Flamborough Lighthouse	Yorkshire	LHV27	M0PGE
	GB2RL	Roker Light	Sunderland Tyne Wear	LH2	G0GFG
	GB4HLH	Harwich Lighthouses	Essex	LH2	M0ZZO
	GB2BTL	Belle Tout Lighthouse	Eastbourne	LH2	M0LRE
	GB2ELH	Eshaness Lighthouse	Shetland	LH	MM5PSL
	GB2WLH	Withernsea Lighthouse	Withernsea	TLHV27	G4HYY
	GB2SCA	Scarborough Lighthouse	Scarborough	LH27	G4SSH
	GB0DLH	Dungeness Light House	Kent	LHV	M0SSR
	GB2LS	Lighthouse Southerness	Dumfries	TLHV27	G0HPK
	GB0BHL	International Lighthouse and lightship weekend	Devon	TLH27	G0TQT
	GB0BMB	International Lighthouse and lightship weekend	Hampshire	TLHV27	G4YVY
	GB2HLH	Hustanton Lighthouse	Norfolk	TLHV27	G1KLP
	GB2WHL	Whitby High Light	North Yorkshire	TLHV27	M0GGR
	GB4LL	Leasowe Lighthouse	Cheshire	TLHV27	G4WUA
	GB0PAS	Pontefract Astronomical Society	Yorkshire	LH2	G0BPK
	GB2GNL	Girdleness Lighthouse	Aberdeen	TLHV27	GM4AJR
	GB2NBL	New Brighton Lighthouse	Wirral	LH	M0BZZ
	GB2BML	Blakeney Mariner Light	Blakeney	TLH2	G3YOA
	GB5ULA	Uniform Lima Alpha	Gloucester	LHV27	G0NXA
	GB5HL	Hartlandpoint Lighthouse	Near Blagdon Farm	TLHV2	M0HWK
	GB2JBM	Sir John Barrow Monument	Cumbria	LH27	G4USW
	GB2LT	Lighthouse Turnberry	South Ayrshire	LHV2	KA7 2NF
	GB2MSL	Museum of Scottish Lighthouses	Aberdeenshire	TLHV27	GM1JNS
	GB2RRL	Rubha Reigh Lighthouse	Wester Ross	LH	GM4CHX
	GB0HEL	Helwick Lightship	Swansea	LH	GW4HSH
	GB0NLH	Needles Lighthouse	Isle of Wight	LH2	G1EUW
	GB2TD	Trywyn DDU	Anglesey	LH27	GW3GUX
	GB2TNL	Tarbat Ness Lighthouse	Inverness	LH2	GM4SUF
21/08/2011	GB2ELH	Eshaness Lighthouse	Shetland	LH	MM5PSL
	GB2MAS	Mottram Agricultural Show	Mottram	LHV2	G4GHB
	GB1SLB	Sunderland Lifeboat	Sunderland	TLHV27	G7PHG
26/08/2011	GB4MO	Military Odyssey	Kent	LHV	M1CCF
27/08/2011	GB2WZ	Westonzoyland	Somerset	LH2	G3YOL
29/08/2011	GB2NCI	National Coastwatch Institute	Cornwall	TLHV27	G3XNE
	GB4CBE	Crofton Beam Engines	Wiltshire	LH2	G6FOP

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the e-mail address.
2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or membership number, telephone number and postal town, in that order.**
3) The Ad may not contain more than 40 words, excluding the information in (2), and may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

5 FEBRUARY – 27th 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. Dave, G4UVJ, 01268 697 978 (evenings) [www.southessex-ars.co.uk].

26 FEBRUARY – RAINHAM RADIO RALLY – Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. 10.00, TI, C. Trevor, G6YLW, 07717 678 795, trev@wig1.co.uk.

4 MARCH – CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB RALLY – Wood Green Animal Shelter, King's Bush Farm, A1198 London Road, Godmanchester, Cambs PE29 2NH. OT 10:00, CP, £3, TI S22, TS, B&B, LB, C, DF, SIG, FAM, Contact John, G0GKP, 01954 200 072, j.bonner@ntlworld.com. [www.cdarc.co.uk].

1 APRIL – SOUTH GLOUCESTERSHIRE AMATEUR RADIO RALLY

22 APRIL – 28th YEOVIL QRP CONVENTION

24 JUNE – WEST OF ENGLAND RADIO RALLY

4 NOVEMBER – HOLSWORTHY AMATEUR RADIO RALLY

CLASSIFIED ADS

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

FOR SALE

WANA DATA INTERFACE ? You need an Isoterm! GOTA VIBROPLEX BUG KEY ? You need a CableTidy! Job Done.... Our Product help is always available. See www.g3liv.co.uk johnny@melvin.com 0191-2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

PROGRAMMING AND DATA MODE CABLES for Icom, Yaesu, Kenwood, Ten-Tec, Motorola, Vertex, and many other brands at www.radioarena.co.uk Tel. 0845 0942245 info@radioarena.co.uk

X-TALS 3.560/7.030/10.106/10.245/ 14.060MHz £5-95/set Pr Carrier 10.7MHz +/- 1.5kHz, 9.0MHz +/-1.5kHz £3-95/pair 7x9MHz Matched ≤30Hz £6-95/set P&P £1-50 + VAT. Many freq ex-stock. vincentvoy@hotmail.co.uk 0208 391 0545

CTCSS, DTMF and PIC kits, low prices, all in stock, low postage costs, www.cstech.co.uk

WWW.CZECHMORSEKEY.CO.UK
50 years old, still in original factory wrapping, extremely well made with superb keying action.

HP 8754A VECTOR NETWORK ANALYSER opt H26 0.5 – 2.6 GHz c/w 8502A transmission / reflection test set opt. H26 , power splitter, matched cable set and operating and service manuals. Also free to buyer misc. r.f. cables, connectors, couplers, loads etc. Offers requested. Buyer collects. Stroud Gloucs 01452 812951.

BUSINESS OPPORTUNITY

A GREAT FULL/PART TIME business opportunity for the right person. Details: www.proantennas.co.uk

AERIALS

WWW.PROANTENNAS.CO.UK
The Dual Beam Pro and the I-Pro Home have recently received excellent RadCom reviews and are now available direct: 01489 789960

M0CVO ANTENNAS HF and VHF
antennas, fixed or portable. Full details at: http://www.m0cvoantennas.co.uk

LIQUID ELECTRICAL TAPE- waterproofing for outdoors. £9.50. Velcro straps - ideal for supporting temporary antennas. £5.99. Antenna poles. 7m fibreglass. £17.95 Prices include p&p. SOTAbeams, 89 Victoria Road, Macclesfield, SK10 3JA. 01625-425700 www.sotabeams.co.uk

VORTEX ANTENNA SYSTEMS
New UK Manufacturer and hardware supplier. Delta Loops, Yagis, Monoband and Multiband, OWA Arrays, Bespoke Designs. Antenna parts and mounting solutions. 6082-T6 Metric Tubing, Stainless U-Bolts and much more. www.vortexantennas.co.uk or 07943 871893

AERIAL PARTS: CLAMPS, BRACKETS, bearings, accessories and advice for the home-brew aerial builder: www.aerial-parts.co.uk

G4TPH PORTABLE MAGLOOPS back in production. The new ML-40 MKII covers 40m thru 15m. Improved SWR. and power handling See SWR charts at: www.g4tph.com

EQUIPMENT

VHF/UHF ACCESSORIES and aerials, TVI filters, 4m & 6m transceivers. GAREX ELECTRONICS PO Box 52, Exeter EX4 8WX Tel: 07714 198374 www.garex.co.uk

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376 email: radiorepairs@btconnect.com

MISCELLANEOUS

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147KHz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

Holiday Cottage for up to 12 persons, eastern France, JO28RJ, facilities for the disabled. Roman amphitheatre, mosaic museum within ½ km. Elevation 375m (locally 440m max to NE). Has 2m/70cm collinear and 40+ m garden space. Details http://www.apollon-gite-grand.fr/ Mobile: 0033 670 968 765

ACCOMMODATION NORTH CORNWALL
Self catering large bungalow and static caravan in 1.5 acre grounds, Use 80/40 aerials, Pets welcome. Ring for Brochure, G3SPE 01566 781493

CARDS & DESIGN

QSLERS 50 COLOUR PHOTO QSL CARDS one sided £15 including design and postage. 1000 full colour cards £75 inc postage. MODOL Chris, 24 Westridge, Northampton NN27RA

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.com

WANTED

UNWANTED VALVE AMPLIFIERS, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Cash paid. Contact Peter G3ZRS on 01482 862323 or e-mail: g3zrs@hotmail.co.uk

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE FOR YAESU RADIOS. http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

CONTEST LOGGERS - SD by EI5DI.
RSGB and international contests.
HF €25, VHF Free. www.ei5di.com

BUSINESS CARDS

CLASSIFIED ADS

REAL AMATEUR RADIO

Mike, G3TMB

Further to the Data column written but Andy Talbot in *RadCom* of August where it talks about "But it's not Real Amateur Radio, is it?"

I think it was my previous letter to *RadCom* that he paraphrased and I was very impressed by your piece, Andy! It was very well written and it taught me quite a lot about PSK etc, of which I did admit I knew very little, having no interest in using my computer for that kind of thing. So I had not really read up on it!

But Andy, I'm still not convinced! So I will stick with what I know. Different strokes for different folks as the old TV show said.

One thing that annoyed me though was that phrase "many operators use computers to generate Morse rather than bashing it out on a semi-automatic or even worse a manual key." Oh Andy, to Morse men like me that is heresy!

I was a wireless operator in the RAF, a Radio Officer in the MN for 10 years and after that 14 years with Cable and Wireless, then the Post Office as a telegraphist (a word you don't hear much of nowadays!). I used to send and receive in excess of 40 to 50 wpm on a straight key and would never, ever use a bug key or anything of the sort! As for generating Morse, perish the thought! I once got into a nice QSO with an op operating at about 35wpm when suddenly it went quiet, I asked him if we were still in QSO and he suddenly changed to SSB and said his Morse generator (presumably his computer) had packed up – he was using a Morse reader too. Without them – nuff said and end of QSO! Another thing us Morse men could always do was to know who was at the other end of the circuit as every fist is different, you can't now!

In closing, let me say a very good article Andy but I'm 81 now and a bit set in my ways I'm sorry to say.

FIRST OAM SIGNAL EXPERIMENT (AUGUST *RADCOM* P11)

A J Turner, G3UFP

The basis of the scientific method is that a theory is postulated and experiments are made to prove it. It would therefore be useful if *RadCom* were to publish a reference, in which Professors Tamburini and Thide give the solution to Maxwell's Equations that predicts the existence of a wave with 'vorticity'. In fact it would be even more interesting if they can show that Maxwell's Equations do not apply to ALL electromagnetic phenomena. Another important part of scientific method is that experiments must be repeated by independent workers. For this reason full experimental details are always released. I look forward to seeing these in *RadCom* also. I hope that a lot of pointless speculation does not get published about 'vorticity' until full attention is given to the scientific basis for it.

If you were interested in this experiment, you may find the following links of interest.

www.youtube.com/watch?v=ObZzpw5kXH8
www.youtube.com/watch?v=Fc9TNAATshA
www.lswn.it/comunicati/stampa/2011/arriva_suono_che_apre_le_porte_al_futuro_delle_comunicazioni
www.vorticiefrequenze.it/italiano/aspettoscientifico.html

If more research is completed and published, we will bring that information to RSGB members. ***Editor***

MORSE MAGIC

Patrick D'arcy, G4YBP

I thought many members would like this information. I like to use CW about 50% of the time when on the bands. I can receive CW at about 20 wpm but I like to listen to faster CW – but hate it when I miss a word that I have never heard before. So I set myself a goal of listening every night to a good CW QSO and that has helped, but very slowly.

So I decided to look for a program for my PC. I did find some but they were too basic. I thought about my phone and as it's an Android type that you can download lots of applications. I searched and found lots of different apps on offer and tried most of them but the best one is called Morse Trainer by Wolphi LLC. You can tell it by its badge – a red square with the words CW trainer on it. Once downloaded you can set it to give random letters, numbers, mixed letters/words, random words (that's what I wanted), thousands of callsigns or lots and lots of typical QSOs. The cost is only £0.51 but it's well worth it. Now I use it all the time but I've invested in some miniature headphones as I was getting some strange looks from people! I also found a ring tone app that means anyone in my contact list has their name played in CW when they phone me – yes, very sad, I know!

PROPAGATION

Steve, G0KYA

It was great to read the piece about Sporadic-E in August's *RadCom*. It certainly is a propagation mode worth looking at in the summer.

However, to avoid confusion I'd like to clarify one of the technical terms in the feature. The Maximum Usable Frequency (MUF) is actually the highest frequency that can be used for transmission between two points at any one time. What Jonathan and Tatiana describe as the MUF is actually what we call the Critical Frequency – the frequency at which signals, when sent vertically upwards, are not reflected back, but continue on into space.

On a typical long-distance path you will find the MUF to be much higher than the critical frequency. This also applies to Es contacts, where you can often hear Scottish stations on 28MHz from southern UK, but the critical frequency will be a lot lower than this.

PLT PRESENTS A BUSINESS OPPORTUNITY

Chris Jones, RS195408

I have recently started to think that Ofcom's attitude to PLT devices presents a business opportunity that it would be useful to explore. As a test of Ofcom's certainty in its attitude to PLT devices, a company should be set up to market and CE mark a special PLT device that is designed to send audio information and music over the power wiring of a building, coincidentally using the same frequencies and modulation that have traditionally been used in broadcast radio entertainment. I feel that the pirate radio community would be keen to purchase these high power AM, FM and DAB PLT devices (obviously for the purpose of sending audio signals from one room to another in their houses), and they would be prepared to tolerate the unwanted side-effect that everyone in the area would be able to hear their PLT signal on their radios. Since these devices would be completely legal to operate, commercial radio stations might also purchase these devices as a cheaper alternative to renewing their broadcast licence in the usual way. I think that the equipment to be submitted for CE approval would be broadly similar to a transmitter with antenna tuner, but with Y-rated coupling capacitors to connect it to the mains plug. A hard-wired version without the 13A fuse might be needed in buildings where it is necessary to use more RF current than the fuse can withstand, in order to maintain PLT communication within buildings having mains wiring that has unfortunately high radiation losses. An enterprising electrician might also build a profitable business installing and tuning such wiring. I'm sure that Ofcom would gladly forgo control over broadcast radio and the associated licensing revenue in order to prove that it was right all along about PLT devices being legal.

We publish this as a tongue in cheek contribution to the PLT debate, not to condone it. ***RSGB***

RECOGNITION DESERVED

D T Atkinson, G0WOU

I am writing to you today to say many thanks indeed to Andy Hayes, the Ofcom team and the RSGB EMC committee for all their hard and thorough work on my behalf. They helped me to resolve a problem I had with interference from a plasma television set. Ofcom have worked tirelessly on my behalf with great communication advising me all the way on what is happening with investigation.

I had the great news that the supplier of the plasma TV are now going to remove the offending equipment and supply a new LCD television in its place. Hopefully, this will end this matter and give all other radio amateurs great hope that the RSGB and Ofcom do work hard on our behalf.

USING THE RADIO WHILST DRIVING

John, M3YSK

Whilst monitoring the stations using a repeater in Surrey, I heard one mobile callsign explain that he would have to sign-off momentarily for fear of being seen using a fist microphone by a passing police patrol. With this in mind, I had a look at the relevant law and write to ask if any reader with a road traffic law background could let me know if what I have found is

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk. Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right not to publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Additional letters may be published on the RSGB members-only website at www.rsgb.org/membersonly/lastword.

up-to-date and also if the RSGB has a view, save for the obvious need to be careful whilst driving.

As I understand it, the Road Vehicles (Construction and Use) (Amendment) (No 4) Regulations 2003 (Statutory Instrument 2003/2695) amends the 1986 Regulations and prohibits the use, whilst driving, of a 'hand-held mobile telephone' or other specified 'hand-held device' (which is a device other than a 'two-way radio'). The Regulations are not, by my reading, contravened by using a 'two-way radio', this being any 'wireless telegraphy apparatus' (as per the Wireless Telegraphy Act), which is designed or adapted for the purpose of transmitting and receiving spoken messages and operates on a range of non-prohibited frequencies; neither 144MHz or 433MHz are within the prohibited ranges.

So, I reckon that using an amateur 'two-way radio' on 2m and 70cm is permitted whilst driving. Are there any thoughts from someone 'in the know'?

The position is that 'two-way' radio is exempt from the regulations prohibiting use whilst driving. In the rather obtuse double negative of the legislation, two way radio is defined as:
any wireless telegraphy apparatus which is designed or adapted –
(i) for the purpose of transmitting and receiving spoken messages; and
(ii) to operate on any frequency other than 880MHz to 915MHz, 925MHz to 960MHz, 1710MHz to 1785MHz, 1805MHz to 1880MHz, 1900MHz to 1980MHz or 2110MHz to 2170MHz;

This means that amateur radio use whilst mobile is permitted. But of course appropriate measures need to be taken to ensure that proper control of the vehicle is maintained at all times. ***RSGB***

BIRDS NEST AND DEAD BUG CONSTRUCTION

Blackie and Sparrow, on behalf of The Avian Community in G4JNT's garden, figurehead: the late Basil Tiel, www.g4jnt.com/basil.htm.

We are unhappy about a term used in amateur radio and seen in *RadCom* that denigrates our home making capabilities. Referring to the term 'birds nest construction', if we built anything as untidy as some of the things we've seen looking into Andy, G4JNT's, window, our youngsters would have a very unpleasant time indeed after they hatched, and we suspect the nest wouldn't even survive the first strong wind of the season. And surface mount components would be very uncomfortable to sit on.

We prefer the term 'rats-nest' construction to be used instead.

However, on the plus side, the red-fronted brethren amongst us especially do approve of his 'live-bug' construction technique. It is ost unfair of home-brewers to kill their bugs beforehand, and we're pleased to see he preserves them to solder onto the things he calls PCBs.

MANY THANKS

Ian, G6TGO

I would personally like thank all the staff in the Editorial office, June and those in the Finance Dept as well as those in the RSGB Shop (who I do not know) for their continued professional service and support I receive as a RSGB member, long may it continue.

Edward Rippon, M0EPR

I would like to thank all that have been in touch regarding the re-formation of Nottingham RAYNET Group that is now very much underway, especial thanks go to Tony, G7MED, and Dave, M0DSN. Training events will be taking place regularly and by the time this goes to print should see the back of our first foundation examination for newcomers. We are still seeking members to join us and will continue to do so, the more the merrier. For more details about events, training or joining us, contact M0EPR on 07974 491 299 or e-mail m0epr.sarc@yahoo.com

STANDARDS

M Beddard, M1EGX

I feel I must put pen to paper to say how horrified I have become with the standard and behaviour of certain so-called radio operators. For example I have just been listening to a QSO between two English operators. The language that they were using was the most obscene, racial and offensive language you can imagine. This is not by any means the first time I have heard this type of QSO, please could someone tell me if anything is being done to curb such behaviour. I realise that Ofcom are stretched at the moment due to government cuts, etc, perhaps its time for the RSGB to step forward and take on board that our hobby is going down the drain very quickly and unless action is taken we shall become licensed CB.

Sadly, abuse of our bands like this is not a new phenomena. I can recall hearing similar content in my SWL days and when I was first licenced in the late 1970s. Of course, that does not excuse such behaviour but it does indicate it is not simply the newcomers who are responsible. What can, or should, we do about it? Well, the RSGB established the Amateur Radio Observation Service in 1977 to help tackle problems like this. Reports of abuse can be sent to AROS at aros@rsgb.org.uk. AROS has a network of local Observers who can collect further evidence and, if enough solid evidence can be collected, this can be passed to Ofcom for appropriate action. Of course, this does require those who hear abuse to be prepared to report it. If they do not, such abuse will continue unchecked.
Brian, G8OSN, AROS Coordinator.

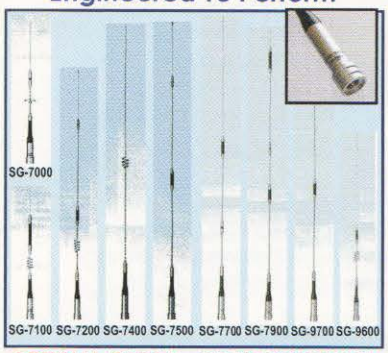
WATERS & STANTON

Orderline 01702 206835

DIAMOND ANTENNA

Exclusive UK Dealer For Over 30 Years!

Engineered To Perform



SPECIAL OFFER - FREE POSTAGE!

SG-2000	2m/5.2dB 1.59m	£92.95
SG-7000	2m/70cm 2.1/3.8dB 0.47m	£79.95
SG-7100R	2m/70cm 2/4.8dB 0.62m	TBA
SG-7200	2m/70cm 3.2/5.7db 0.96m	£94.95
SG-7400	2m/70cm 2/5.5dB 0.99m	£84.95
SG-7500	2m/70cm 3.5/6dB 1.06m	£93.95
SG-7700	2m/70cm 4.3/6.8dB 1.27m	£99.95
SG-7900	2m/70cm 5/7.6dB 1.58m	£112.95
SG-9500M	2/70/23cm 3/6/9.7dB 1m	£119.95
SG-9600	6/2/70cmdB 0.82m	£99.95
SG-9700	6/2/70cm 0/3/5.8dB 1.07m	£109.95

Diamond Mounts

K-11 Gutter mount adjustable tilt £39.95 A
K-300 Black gutter mount adjust. tilt £TBA
TRA-II Trunk lip adjust. + 4m cable £TBA
K-600M Trunk lip adjust + cable £76.95 C

K-33 Hatch Mount adjustable £47.95 A
K-400 Heavy Duty Hatch mount £42.95 A
CRM Roof rail / Mirror Mount £15.95 A
K-512 Roof bar mount £49.95 C
ECH 5m cable kit PL-259 £13.95 A

DP-7RH Compact 40/30m Dipole

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.
£139.95 C

HF Verticals

CP-6 80-6m 200W with 1.8m rigid radials. Mast mounted. 4.6m long £389.95 D

CP-8040 80-40m with 1.8m rigid radials. 6.5m long. £459.95 D

KV-5 80-40m ground mounted vertical approx 6.5m long. £399.95 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. £449.95 D

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 £144.95 C

SX-200 1.8 - 200MHz. 5/20/200W FSD. 1W sensitivity for FSD. Single sensor. 0.15dB insertion loss. PEP/RMS £99.95 C

SX-400 140 - 525MHz. 5/20/200W FSD. 4W sensitivity for FSD. Single sensor. 0.2dB insertion loss. PEP/RMS £109.95 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. £179.95 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 £259.95 C

Diamond Power Supplies

GSV-3000 30A **GSV-1200** 12A

GSV-3000 30 Amps continuous 1 - 15vDC variable 250 x 150 x 2400 mm inc. DC cooling fan, weight 9kg £199.95 C

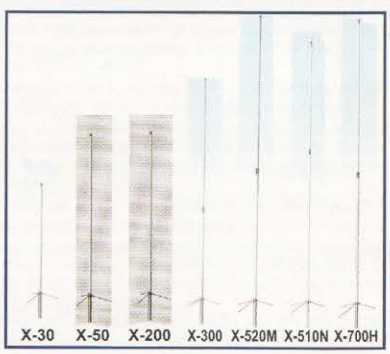
GSV-1200 12 Amps continuous 1 - 15vDC variable 160 x 100 x 2350 mm inc. DC cooling fan, weight 5.8kg £TBA

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

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

GZV-4000 40 Amps continuous 5 - 15vDC variable 210 x 110 x 3300 mm inc. DC cooling fan, weight 3.5kg £229.95 C

Base VHF/UHF Antennas



X-30 2/70cm 3/5.5dB 1.3m 150W £75.95 D
X-50 2/70 4.5/7.2dB 1.7m 200W £82.95 D
X-200N 2/70cm 6/8dB 2.5m 200W £119.95 D
X-300 2/70cm 6.5/9dB 3.1m 200W £144.95 D
X-520M 2/70cm 8.3/11.7dB 2.5m £TBA
X-510N 2/70cm 8.3/11.7dB 5.2m 200W £189.95 D
X-700H 2/70cm 9.3/13dB 7.2m 200W £299.95 D

Watson Power Supplies

Power-Mite-NF

£79.95 C

Compact Cont. 22 Amp Switch Mode PSU variable voltage & noise offset.

Power-Max-25-NF

£89.95 C

Slightly larger than the Power-Mite and ideal companion for any 100W radio.

Power-Max-45-NF

£129.95 C

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset.

Power-Max-65-NF

65 Amp Low Noise PSU. Patented Noise Control that permits you to move any noise away from the operating frequency. £239.95 D

Buddipole Portable HF Antennas

The most respected portable HF antenna system available. Available as a dipole or vertical system - packs down into a carry pack.

The secret of the system is the hi-q coil assemblies.

www.buddipole.com

W3-BP Dipole 40-2m 250W £219.95 D
W3-BP-DELUXE With mast kit £419.95 D
W3-BS Vertical 40-2m £161.95 D
W3-BS-DELUXE Vertical + clamps £194.95 D
W3-CTA Centre T mast clamp £8.95 A
W3-DKB Buddipole Carry Bag £41.95 C
W3-LBVK Low band vertical kit £199.95 D
W3-MBP Mini Buddipole £239.95 D
W3-MK Mounting Kit £36.95 D
W3-MWA-4 Military whips £102.95 C
W3-RAK Rotate arm kit £39.95 C

Miracle Antennas Miracle-Whip

A tuneable telescopic whip covering 3.5 to 460MHz. Up to 25 Watts PEP, fiited with PL-259 plug. Great for FT-817 & IC-703 or any other QRP radio.
£129.95 C

2m/70cm/23cm Mobiles

Compact, high quality "N" connector mobile whips with sprung bases.

SGM-803N Triple band 0/2/5.5dB 60W max. 0.37m long £79.95 C

SGM-805N Triple band 0/3.8/7.2dB 60W max 0.57m long £89.95 C

Avair Power SWR Meters

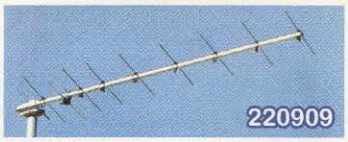
All models have 12V backlight and include DC Cable.

AV-201 1.8-160MHz, 5/20/200/1kW £49.95 C
AV-400 140-525MHz 5/20/200/400W £49.95 C
AV-601 1.8-160MHz / 140-525MHz £69.95 C
AV-1000 1.8-1300MHz. £79.95 C

Cross Needle Models - Even Lower Prices!

AV-20 30W / 200W, 3.5-150MHz £39.95 C
AV-40 15W, 0-150W, 144-470MHz £39.95 C

Tonna VHF/UHF Antennas



220505	6m 5 element 10.1dBi	£118.95 D
220809	2m 9 element 13.1dBi	£79.95 D
220909	70cm 9 element 13dBi	£74.95 D
220919	70cm 19 el. 16.2dBi	£94.95 D
220623	23cm 23 el. 17.9dBi	£77.95 D
220725	13cm 25 el. 18.3dBi	£102.95 D

Create Rotators

RC5-1 Medium Duty Rotator

**Rotating torque: 6kg/m*
**Braking torque: 80kg/m*
**Mast size: 48-63mm*
**Vertical load 400kg*
**Horizontal load 800kg*
**Rotation speed: 60-150sec/50Hz *Power: 230V AC 80VA *Weight: 5kg *Cable: 7-core cable (not supplied) *Requires MC-2 lower mast clamp if mounting on pole* £569.95 D

RC5-3 £719.95 D
Same as above but with preset control.

bhi DSP Audio

NEW NES10-2MK3

Speaker and programmable DSP unit. Offers dramatic noise reduction. £112.95 C

NEIM-1031MKII £142.95 C
Noise Eliminating In-Line Module.
NEDSP-1061-KBD £101.95 C
Noise Eliminating DSP module for FT-817
NEDSP-1062-KBD £106.95 C
Noise Eliminating DSP module for speaker.
ANEM-MKII £127.95 C
In-Line "Noise Away" amplified DSP module.
DSPKR £154.95 C
Noise Eliminating DSP Ext. Speaker 10W.
DTNA - NOISE-AWAY £154.95 C
Amplified DSP Noise Cancelling Desk Speaker.
RADIOMATE £89.95 C
Compact keypad for Yaesu FT-817/857/897.
CAT-MATE £50.95 C
Electronic Y Splitter for Yaesu CAT Interface.

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

UK's Lowest Prices!

www.wsplc.com www.jayceecoms.com

ICOM

Icom's Longest Serving Dealer
Awarded Icom's Longstanding Achievement Award In April 2011

NEW IC-7410 Special Offer! Save £300

* 100W HF-6m all modes.
* Receiver +3-dBm IP3 with 15kHz roofing filter
* 36kHz DSP IF 32 bit razor sharp filter
* Internal Auto ATU Included.
* USB Interface for PC Control/Audio Out
* Large Comprhensive LCD Display
* Integrates Speech Synthesizer

Another winning design from Icom. Notice how some of the "expensive" features introduced a few years ago are migrating down to some of the more affordable radios. Well done Icom.

~~£1999.95~~ **£1695.95 D**

NEW IC-9100 HF to 23cms All-Rounder

HF/6m/2m	100W
70cm	75W
23cm (option)	10W

Satellite Mode Operation: Optional D-Star DV Mode.

The IC-9100 has received rave reviews and is THE radio for those who want everything in one box! Add the 23cms module and the D-Star board to expand your hobby even more. This radio is a real gem and comes with 2 year warranty.
UX-9100 23cms £449. UT-121 D-Star board £129.95. Roofing filters £52.95

£2999 D

IC-7200 HF Transceiver

IC-7200 covers HF-6m in a distictive rugged design employing the latest digital features including extensive bandwidth and filte control. It's a great basic transceiver that allows you to enjoy the Icom quality at a very realistic price. Another Icom winner. Check out spec on pour web pages.

£839.95 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.

£6239.95 D

ID-E880 VHF/UHF Mobile

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

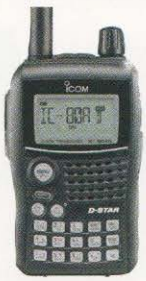
£439.95 D

IC-E2820 VHF/UHF Mobile

The IC-E2820 dualband mobile includes popular features such as VHF/VHF, UHF/UHF simultaneous receive capability, wideband receive, independent tuning knobs and a separate controller. In addition to this new features include diversity receive capability, a full dot-matrix display & 50W output power in both VHF & UHF bands.

£489.95 D

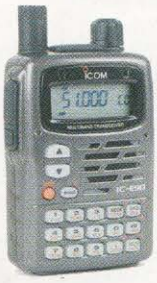
IC-E80D Handheld



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

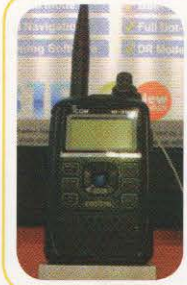
£329.95 D

IC-E90 Handheld



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

£244.95 D



NEW ID-31E Coming Soon!

Previewed at the Friedrichshafen Show the new UHF D-Star Digital transceiver, the ID-31E. This smart looking handheld shows the importance that Icom place on D-Star. It's only a mock up at this stage but will feature:

- Built in GPS Receiver
- D-Star DV/Analogue FM Mode
- DR Mode User-Friendliness
- Directional Keypad Navigation
- Full Dot Matrix Display
- Slim Compact Design
- IPX7 Waterproof Construction
- Free Download Cloning Software
- Micro SD Slot

IC-7600 HF Transceiver

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

£3299.95 D

IC-7000 HF Transceiver

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

£1189.95 D

IC-718 SPECIAL OFFER! SAVE £170 ~~£599.95~~ £429.95 D

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

Other Radios

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

IC-T70E 2m/70cm Handheld NEW

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

£159.95 D

IC-E92D D-Star Ready

The IC-E92D is a waterproof dual band transceiver. The IC-E92D is ideal for D-STAR enthusiasts, active amateurs who are fans of outdoor pursuits or organisations that are looking for a simple GPS position reporting system. If used with the optional HM-175GPS, the IC-E92D provides GPS position reporting functions in DV mode, fully compatible with the IC-E2820 series.

£388.95 D

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