RadCom

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

AUGUST 2011
VOLUME 87
NUMBER 08

£4.75

G7DDN/P

Winners of the 50MHz Backpackers Contest 2010

0811

Friedrichshafen
All the news from Europe's premier amateur radio show

Special Callsigns
Royal Wedding calls excited the airwaves

Around Your Region
Club Calendar and Club News merge

Dedicated 10m
New CRT SS6900 transceiver reviewed

WATERS & STANTON

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Online Catalogue
www.wsplc.com

UK's Lowest Prices!

KENWOOD Amazing TS-590S!

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

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

NEW TH-D72E JUST ARRIVED!

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

£426.95 D

TS-480 Transceiver GREAT PRICES!

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

TS-2000 Series GREAT PRICES!

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

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

VHF Mobiles & Handhelds

TM-V71E	Dual band mobile with echo link	£299.95 D
TM-271E	2m FM with mighty 60W output	£169.95 D
TM-D710E	Dual band mobile 50W with APRS	£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

RigExpert Analysers

NEW FROM £275.95!

A range of neat handheld antenna analysers with graphic displays

AA-30 Handheld unit covering 100kHz - 30MHz. Runs from 2x AA cells. Measures VSWR & reactance. 100 point graph £275.95 C

AA-230 Handheld unit covering 100kHz - 230MHz and running from internal Ni-MH cells. Measures VSWR and reactance. 1kHz resolution £515.95 C

AA-230PRO Handheld unit covering 100kHz - 230MHz & runs from internal Ni-MH cell. Lab quality measurements £575.95 C

AA-520 Handheld unit covering 100kHz - 520MHz and running from internal Ni-MH cells. Measures VSWR and reactance. 1kHz resolution £575.95 C

Little Tarheel Mobile Antenna 160m - 6m!

A Screwdriver Antenna With Remote Control

LITTLE-TARHEELII

The Little Tarheel Mobile Antenna is an electric screwdriver design that will always tune to resonance and low VSWR, no matter what band or frequency. With the standard whip supplied it covers 80m - 6m and will handle up to 200W PEP. For 160m or increased /P performance on 160m to 20m add the 160m kit.

£349.95 D

Upgraded performance 160m to 20m

TH-1956

Park up and operate portable at a new level of efficiency. The 160m telescopic antenna whip kit, adds nearly 4m of whip! That gives 160m operation and a big improvement in LF efficiency. Longer whip, less coil all adds up to a new big signal from your mobile station. Even with QRP from the great idea likes of the FT-817 or the new YouKit HB-1A works well. Your own DXpedition on wheels!

£49.95 C

ICOM

NEW IC-7410 HF - 6m Transceiver

Another winning design from Icom. Notice how some of the expensive features are migrating down to the more affordable radios.

- *100W HF-6m all modes.*
- *Receiver +3-dBm IP3 with 15kHz roofing filter*
- *36kHz DSP IF 32 bit razor ahrp filter*
- *Internal auto ATU included.*
- *USB interface for PC control and audio out*
- *Large LCD Screen with comprehensive display*
- *Integrates speech synthesizer*

£1999.95 D

NEW IC-9100 HF to 23cms All-Rounder

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

HF/6m/2m	100W
70cm	75W
23cm (option)	10W

£2999 D

IC-7600 HF-6m 100W

Take a closer look!

This HF-6m transceiver is the successor to the IC-756 series. It takes features from the flagship IC-7800 and the more recent IC-7700, putting them into a package that brings the price within reach of many more hams. The central display is pure joy with its easy to read & informative screen.

+ FREE USB keyboard! £3299 D

IC-7800	Deluxe HF / 50MHz All-Mode 200W Transceiver	£8999 D
IC-7700	1.8-54MHz 200W with built-in PSK-31 + keyboard	£6239 D
IC-7000	160m-70cm 100W (hf) Mobile, portable or base station	£1189 D
IC-718	160m-10m 100W transceiver that brings HF to those on a budget	£599 D

IC-7200 HF-6m 100W

The IC-7200is a robust transceiver with some nice touches for the price. You get a 6kHz roofing filter and a receiver that goes from 30kHz - 60MHz! You even get DSP digital filtering! If you are looking for a great deal, this should be on your list. We love it.

£839.95 D

VHF Mobiles & Handhelds

^IC-E80D

IC-E80D	**NEW** 2m/70cm handheld + DStar & GPS	£329.95 D
IC-T70E	**NEW** Dual band 2m/70cm handheld	£159.95 D
IC-V80E	2m 5W handheld	£99.95 D
IC-E90	Triple band 6m/2m/70cm handheld	£244.95 D
IC-E92D	Dual band 2m/70cm handheld fitted D-Star	£388.95 D
ID-E880	**NEW** Dual 2m/70cm mobile + D-Star/GPS	£439.96 D
IC-E2820	Dual band 2m/70cm 50/50W mobile	£499.96 D
IC-E2820+	Dual band mobile fitted with D-Star	£699.95 D
IC-910H	Dual band 2m/70cm base station 12V	£1299.95 D
IC-910HX	Triple band base station 2m/70/23cm 12V	£1549.95 D

YouKits FROM CHINA

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

HB-1A-MK3-40-20 5W Transceiver

New In Stock!

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

£199.95 D

Provisional Specification:

40 & 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
Current	Tx 950mA max on
	Rx 55mA
Internal	8 x AA cells
External	13.8v
Tuning Steps	100kHz - 10Hz
Size	140 x 95 x 35 (mm)
Ready Built	

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

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MFJ

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

Large 6.5inch VSWR Meter "Easy Reader"

MFJ-868 / MFJ-867
(HF) (VHF-UHF)

The ideal meter as a central monitor of your transmitter and antenna. The HF version reads FSD of 20/200/2kW with PEP and RMS. The VHF version covers 20/200/400W. Both read PEP or RMS. Requires PP3 batt or ext. 12v.

MFJ-868 **£152.95 C**
MFJ-867 **£159.95 C**

FlexRadio Systems®
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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

HEIL SOUND

Bob Heil's Pro-Set-6

NEW

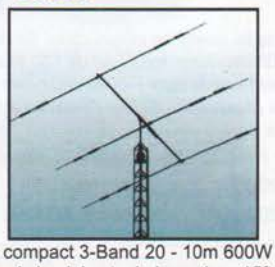
The new Pro-Set-6 headset offers a complete new way of operation with its comfortable headset and adjustable boom mic. giving hands-free operation. But why the Pro-Set 6?

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

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

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

FREE UK CARRIAGE Until 30/7/11

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

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

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www.wsplc.com RIT/ΔTX

YAESU
Choice of the World's top DX'ers

The Fabulous FT-DX5000

All prices subject to approx 2% Increase on 1st February

The FT-DX5000 Series HF/50 MHz 200 Watt Transceivers are a new Premium Class of Yaesu radios with 2 Independent Receivers plus many unique options and accessories designed to meet the Performance Requirements of even the most demanding serious Amateur Radio operator.

FT-DX5000	The basic 200W transceiver	£4339.95 D
FT-DX5000D	Adds SM-5000 SMP station Monitor	£4795.95 D
FT-DX5000MP	Adds above + 300Hz Roofing Filter	£5295.95 D

The most exciting radio this year. It embodies Yaesu's latest technology receiver performance and operating convenience very much at the forefront! This radio will carve a milestone in ham radio. Performance like this does not come cheap, but as an investment it is an absolute bargain. Available in three flavours, This new range embodies many features developed by Yaesu for their top range models - all with 200 Watts output! Features include:Internal PSU, Two independent receivers, Amazing 3rd order IP3, Sharp roofing filters, 32 bit floating point DSP, Variable Audio Filter, Separate IF out (9MHz), and a host of user friendly features and programmable functions.

The FT-2000

NEW LOW PRICE!

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.

"When I switch my FT-2000 on I never cease to be amazed at what this radio offers in terms of value for money. I love the filtes and the variable IF - it always seems to be able to pull the weakest of signals out of the noise. For me it is both my DX machine and chat box - you guessed it, I love it."

FT-2000	100W 160m - 6m	Was £2299.95	NOW £1999.95 D
FT-2000D	200W with AC PSU	Was £2899.95	NOW £2599.95 D

MAJOR YAESU STOCK SHORTAGES!

The production of Yaesu has been badly hit by the earthquake in Japan in March, there will be a big gap in deliveries once current stocks are gone. There are already severe shortages of some models, affected models include FT-950, FT-2000, FT-2000D and FT-817 - ***BUY NOW TO AVOID DISAPPOINTMENT!***

The FT-450D

NEW

- *300Hz CW Filter*
- *New Hand Mic*
- *New Main Dial & VFO Knobs*
- *Key Illumination*
- *Feet*

New and improved version of the FT-450AT.

FT-450D £799.95 D
FT-450 £639.95 D

The FT-857D

FT-857D - Mobile transceiver or base station, this compact radio with detachable front panel. Up to 100 Watts output and coverage from 160m - 70cms, makes this a great buy. £679.95 D

The FT-950

The FT-950 is an advanced class base station transceiverinc 6m, 3 roofing filters and intennal ATU. £1265.95 D

The FT-897D

Very compact portable transceiver 100W radio from 160m - 70cms. You can even run it at 20W from optional internal batteries. DSP & memory electronic keyer inc. Ideal one-man expedition radio. £779.95 D

The FT-817ND

160m - 70cms with 2.5W on internal battery and 5W out when connected to external 12V. SSB CW FM AM - all in a diminutive portable package. Comes with VHF/UHF whip and charger. Switchable BNC (front) or SO-239 (rear).

£509.95 D

VHF-UHF Mobiles & Handhelds

^ FT-1900E ^ FT-7900E ^ FT-8900R

FTM-350E	SPECIAL PRICE 2m/70cm Mobile + Bluetooth GPS APRS	£479.95 D
FTM-10E	50/40W 2m/70cms stereo FM Mobile	£309.95 D
FT-1900E	2m Mobile 65W	£129.95 D
FT-2900E	2m Mobile 75W	£139.95 D
FT-7900E	2m/70cm Dualband Mobile 50/45W	£239.95 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
FT-60E	2m/70cms, 5W handy Wideband Receive	£129.95 C

The VX-8 Handheld Series

Triple Band IN STOCK!

VX-8DE Triple Band

The VX-8DE 5W Triple Bander offers Bluetooth Hands-Free Operation with GPS/APRS and Real RF-Dual Wideband Receive from 500kHz - 1GHz FM & AM. The next generation Amateur Hand-held transceiver from Yaesu, who has been introducing Leading-Edge Transceiver Technology for years. Shower proof and shock proof. £369.95 C

VX-8GE Dual Band

- *Smart Beaconing ™ Function: beacon timing is automatically adjusted to your traveling speed & location.*
- *Station List memories increased from 40 to 50.*
- *APRS Message memories increased from 20 to 30.*
- *DIGI-PATH route indication function .*
- *Head up compass display to the GPS Screen* £359.95 C

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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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 September edition of *RadCom* is expected to arrive with most members by 30 August, although this can take up to a week longer in some cases; international deliveries can take longer still.**

All material in *RadCom* is subject to editing for length, clarity, style, punctuation, grammar, legality and taste. No responsibility can be assumed for the return of unsolicited material (if in doubt, call us first!)

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

RSGB MEMBERSHIP – Annual Rates from 1 January 2011

Full membership (individual & club) £51.00
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.

Mark Hill, G4FPH and Dave Pick, G3YXM as they operated G7DDN/P from Forhill Picnic Place near Wythall in the 50MHz Backpackers contest 2010. The antenna is a 3 element Spiderbeam modelled in EZNEC and built using bits of wire and broken fishing pole.

Photo: G7DDN.

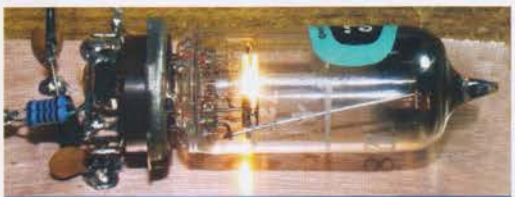
News and Reports

Auto ATU for loop antennas – P16

Members' offer

Reviews

Features



Calibrated thermionic noise source – P19

Novel loading coils for VLF – P58

Technical Features

Regulars

The new QRP Elecraft KX-3 – P54

Creating the New RSGB

Since my item in the July *RadCom* about the issues that the RSGB faces and the actions the Board is taking, I have been heartened by the many suggestions and comments about what we should be considering and some of the important "to-do's" as seen by our members. It is good to know that so many people care so deeply about the Society and want to see it succeed. Thank you for your input.

Unsurprisingly, some of the comments were mutually conflicting, highlighting the point that we cannot please every member on every issue of importance to them. But every input will be carefully considered and I hope everyone who wrote has had a reasoned response from me. Please keep your comments coming – write to haveyoursay@rsgb.org.uk or use the webmail form available from the home page of the RSGB website.

Despite some conflicting messages, there were some consistent themes. The Board has received a verbatim copy of everything so far (and the response given), together with a synthesis of the core themes. This will also go to our Advisory Group, which meets for the first time in late July (after August *RadCom* goes to press).

The Advisory Group (AG) comprises nine people:

Don Beattie, G3BJ, RSGB Board member and Acting General Manager
Phillip Brooks, RSGB Board member
Chris Duckling, G3SVL, non-exec Chairman of two SMEs and own consultancy business, Chairman CDXC
John Gould, G3WKL, RSGB Board member
Richard Horton, G3XWH, Director of IT Systems, Harrogate Ladies' College
Alan Messenger, G0TLK, General Manager and head of IT to a property investment company and Chairman of a charitable Housing Association
David Palmer, G7URP, Founder and Managing Director of DCP Microdevelopments Limited
Michael Wells, G7VJR, Managing Director 'Third Light'
Dave Wilson, M0OBW, RSGB President

It will be the role of the AG to recommend to the Board the steps to be taken to reshape RSGB strategies to enrich the membership experience, directly underpin the development of amateur radio for the next decade or so, and to propose what actions need to be taken now to stabilise the RSGB finances and build a sound foundation for the future.

Once the recommendations have been considered by the full Board, we will share the output with the membership. In the meantime, on page 8 of this issue of *RadCom* you will find a short article by RSGB Board member John Gould, G3WKL, commenting on the 2010 Amateur Radio Survey, in which many UK radio amateurs participated. You will also find a link to the detail of the survey results on the RSGB website. Whilst the results of this survey are just one input to the AG's work, you may find some of the messages interesting.

Finally, the matter of transparency was raised by a number of members in the comments I have received. The Board has taken this to heart. As a first step we have agreed with Ofcom that a summary note of items discussed at the regular Ofcom-RSGB forums should be published quickly after each meeting. You will find a summary of the meeting held on 6 July on page 7.

Don Beattie, G3BJ
Acting General Manager

President 2012

The Society's Bylaws (which can be varied by the Board) currently require that in the years when a new President is to be appointed, the name of the new President be announced to the membership in the August *RadCom*.

The Board has considered the question of the choice of President for 2012/13 and has decided to defer the decision until the current work being done by the external Advisory Group is further advanced. The final choice of President is a matter for the National Council, which next meets in September, at which time the choice of President is expected to be confirmed.

Club of the Year

REGION 13 WINNER. Lincoln Short Wave Club was the regional winner of Club of the Year Trophy, sponsored by Waters & Stanton. The club is an inclusive club for all interested in amateur radio in all its facets. It aims to spread the word about the hobby as widely as possible and train anyone interested in gaining a licence. The club is committed to work to provide facilities for good of all members and the wider the amateur radio fraternity.

Not only does the club run successful amateur radio courses and exams but they operate a mentoring system to help new amateurs.

Operating at the National Hamfest 2010.

RSGB Board Vacancies

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

Whilst any member may seek nomination to stand for election, 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 and Technical portfolios. Those standing for re-election hold the Business Management and Public Services portfolios. 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.

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

If you wish to seek nomination, please e-mail GM.dept@rsgb.org.uk for the nomination papers. Completed nomination papers, with supporting signatures of ten RSGB Corporate Members, must reach RSGB Headquarters by 1 October at the latest.

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

This notice will appear again in the September 2011 issue of *RadCom* and at that time will also include details of the Regional Manager vacancies for 2012.

Region 4

York ARS received a Certificate of Merit from Region Manager 4 Harold Scrivens for the club entry for the Club of the Year competition. The presentation was held at the Guppy club where York ARS meets each Friday evening.

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 T Knight	G2FUU

60 years

Mr R Turner	G3IMG
Mr D C Youngs	G3JIE
Mr S Harle	G3MEA
Col GRK Lyon	VK6LK

50 years

H Hensler	DL6DZ
Mr S J Newton	G3OPD
Mr J Carson	GM3OXK
Mr R E A German	G3OZT
Mr J L Delves	G3VHH
Mr R G Davy	G3XVF
Mr P W Whipps	RS25605

RSGB and Ofcom meet to discuss licensing issues

In its regular 'Forum' meeting with Ofcom on licensing matters, held on 6 July, a number of issues concerning amateur radio in the UK were discussed. The meeting was attended by five delegates from the RSGB and five from Ofcom. The following were some of the key points discussed:

- The position on relinquishing spectrum temporarily for the 2012 Games was again reviewed. Ofcom is still assessing the full requirements, but it is hoped that the implications for the amateur service may be known in late summer.
- RSGB had supplied a number of names and possible candidates for the Ofcom vacancies for 'venue engineers' for the 2012 Games and these were being reviewed by Ofcom.
- Proposals for special callsigns for four flagship demonstration stations, other special event stations and amateur stations generally during the period of the 2012 Games, were discussed. Subject to final approval from LOCOG, Ofcom would approve a range of special calls for the period of the Games. A discussion was also held on how most simply to give effect to generic changes in prefix for the period of the games.
- The way in which amateur radio NoVs are currently processed was discussed, and Ofcom confirmed that they are seeking alternative ways of handling the administrative processes involved. The RSGB is considering its future role in this and will shortly respond to Ofcom.
- Changes to the rules governing Short Contest Calls were discussed and agreed in principle. The RSGB is now to make formal proposals to Ofcom.
- The position on improvements to 5MHz access was reviewed. Ofcom will continue the discussions with the primary user of this part of the spectrum.
- Specific detailed cases concerning a linked repeater proposal, a special event callsign, issues of permitted power and provision of data for the RSGB Yearbook were also discussed briefly.
- Ofcom indicated that it intended to periodically conduct spot checks of examination conduct.
- Ofcom confirmed that it would have a presence at the National Hamfest in Lincoln at the end of September.

The meeting is one of a regular series of meeting with Ofcom, some covering licensing matters and some covering spectrum/enforcement issues. Further reports will appear as these meetings take place.

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 C Price, 2E0BMA
Mrs A Andrew, 2E0CFH
Mr R Banks, 2E0RTB
Mr K N Lowcock, 2E0VEK
Mr W Toher, 2I0UCH
Mr E J Dudley, 2M0EDU
Mr R Hutton, 2M0RDH
Mr A Razif Ramli, 9M2RT
Mr J C Prat, F5PU
Mr I Goodier, G0UWK
Mr R Hewlett, G3UKU
Mr R Newman, G3VZL
Mr M W Bliss, G4AQS
Mr S Barrett, G4HTZ
Mr J Pymm, G4JPK
Mr A Moriarty, G4TRY
Mr M Johnson, G6ONV
Mr N Titcombe, G6ZFY
Mr J N C Cash, G7AZA
Lifeboat ARS, 7LFC
Mr D Harper, G7NKL
J L H Buck, G7RWF
Mr G McSweeney, GI4CFQ
Mr S Sinagra, IZ0MJE
Mr R J Secondo, KB7VWC
Mr M J Dusa, KC9PHW
Mr C N Fernando, LW5DNC
Mr A T Duffy, M3WDM
Mr W Saint, M6AUM
Mr J P Harris, M6AWU
Mr D Howarth, M6AXC
Mr A F Chapman, M6AXI
Ms R Whitehead, M6BEX
Mr K Bell, M6BMB
Mr D Cross, M6DDT
Mr D Martin, M6DKH
Mr C Gilbert, M6DLG
Mr M D L Palmer, M6DLP
Mr D Shannon, M6EFC
Mr D Wall, M6ETA
Mr A Bartrop, M6FAR
Mrs J White, M6JGR
Miss A Cappleman, M6KAP
Mr D Aldred, M6KFC
Mr B Wogden, M6KXQ
Mr M Leveridge, M6LEV
Mr D Glover, M6LIO
Mr L Bradley, M6LWB
Mr D Berry, M6PIC
Mrs H Mallinson, M6UXH
A J Rowland-Stuart, M6WKF
Mrs M Wall, M6WMA
Mr R Whitehead, M6YLJ
Mr N S Armstrong, MI6OAZ
Mr J R Rankin, MM6AVE
Mr J Hutton, MM6JOH
Mr C Summers, MM6NLC
Mr D Kennedy, MM6YRO
Mr G Jones, MW0RSV
Mr C W Davies, MW0WZX
Miss G Powell, MW6AXV
Mr M Williams, MW6SEF
Mr S D H Saunders, RS193128
Mr R Hayes, RS207477
Mr P Archer, RS208268
Mr A R Pawlak, RS208386
Mr S Cowley, RS208415
Mr S Coates, RS208423
Mr N E Robinson, RS208456
Mr D Rowntree, RS208459
Mr J R Haworth, RS208487
Mr P H Thomas, RS208498
Mr T Hussain, RS208510
Mr J Leith, RS208523
Mr M Woodhead, RS208527
Mr J B Worthington, RS208578
Mr J Stoppenbach, SA6BMG
Mrs J Mansfield, W0PFK
Mr D Green, ZS4BS

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

Mrs G Whitehead, 2E0JIL
Mr B L Beckett, 2E0LAH
Mr T Oliver, 2E0VAI
Mr G E Foreman, 2E1IIC
Mr A Bartsch, DF2TB
Mr P C B Gautier, F6CBE
Mr S Doveton, G0JNR
Mr C J Kidger, G0LOL
Mr D Gilbert, G0NFA
Mr M Marriott, G0OPC
Mr C E Bray, G3RWQ
Mr V R Brown, G3SDQ
Mr R E Pearson, G3XUH
Mr I J H Wassell, G4KDR
Mr P D Gaskell, G4MWO
Mr R S Smith, G6BWM
Mr P J Whelan, G6JTB
Mr D H E Coles, G7GZC
Mr F Rice, G7LPP
Mr M Barfield, G7MRV
Mr S F Mullen, G7NJX
Mr D R Dukeson, G7NNZ
Mr J Flynn, G7OCD
Mr D Hone, G7OQH
Mr P J Shore, G8IYE
Mr R Collis, G8TZU
Mr J C Dolan, GW3PRW
Mr R M Banks, GW4WND
Mr M J Whitehead, M0DXV
Mr N A Trangmar, M0YMM
Mr R J Duncan, M1DIR
Mr R Read, M5BMW
Mr R H Bicker, RS170896
Mr A Kalebo, SM7NDY

UK Amateur Radio Survey

Between October and December last year we ran a survey to capture the current state of the hobby, how it might develop over the current decade and the role that the RSGB plays in supporting the hobby and its members. The survey was a part of a wider data capture task that the Board put in place last summer ahead of a planned review of long-term strategy. As presented at the AGM and detailed since in *RadCom*, recent events have led to the initial stage of this work being undertaken by a specially formed Advisory Group, comprising a few members of the Society with relevant business expertise along with some members of the Board. This article has been written to provide an overview of the questionnaire analysis, which was issued to the Advisory Group for its meeting toward the end of July. Because of the size of the analysis and its graphical content this is published online, see the link at the end of this article.

2,231 or just over 10% of you completed the online questionnaire, which was slightly in excess of expectations. This was good to see. Thanks to those who participated. We also had a useful response from non-members, which was also encouraging. This included those whose membership had lapsed (462) and those who had never joined the Society (326). In terms of the UK amateur community, thought to be around 55,000 licence holders, it was a much smaller percentage than that from our membership, which is not really surprising.

There were also a large number of people who left incomplete responses on the system. Of these, 587 said that they were members, 256 were lapsed members, 168 had never been members and 97 didn't answer this first question. Whilst the system allowed incomplete responses to be picked up at a later date and finished, it is quite possible that some of these represent people who re-started the process and hence left an incomplete response on the system. We can only surmise at the other reasons for these incomplete responses. Some could have been from people just wanting to try out the Questionnaire to see what happened and how it worked before making a serious attempt, others may have decided that it was taking too long to complete, didn't like some of the questions and some possibly had difficulties with the software, internet connection, etc, and just gave up.

In forming conclusions from the analysis we have had to consider the sample size in relation to the total population in each group (member, lapsed member and never-been-member). We have also had to remain aware of bias, for example by running the survey only online some who might have responded to a paper survey were unable or unwilling to participate. In statistical terms we therefore have to treat the conclusions with care; many only represent a trend or possible trend amongst our membership. Of the lapsed member and never-been-member groups we need to remember that the findings represent those from the UK amateur community motivated to participate in an RSGB-badged online survey.

Some of the analysis of the data was able to be done quickly following the end of the survey; the *LimeSurvey* software that we used has its own basic analysis package. The full analysis was only completed at the end of June. This was because some of the more subtle analysis outcomes needed special query routines to be run against the data, then the output was was manually processed to provide graphical displays. Had we had more call on specific statistical analysis software such as *SPSS*, *R*, etc, the process would have been quicker and easier. The other task that took even longer was to read and collate the thousands of textual comments, some of which were mini-essays! As well as collating these textual comments we needed to be alert to the gems that may exist within this part of the data. The analysis of this textual data took more time than we expected, so we have not yet taken the additional step of contacting some of those who left their contact details to follow up specific ideas. As the strategy work moves from generalisations into specifics, this is something that we may decide we need to do, and some of the gems, referred to earlier, may become more obvious as the strategy work develops.

It is difficult to summarise the vast amount of information gleaned from the questionnaire, but one of the early areas we looked at was to compare the age profile of those responding to the questionnaire with that in our membership database. Apart from finding that we had a reasonable response from the spread of age groups, the task highlighted that the average age of members has increased by 10 years between 2000 and 2010. We had many concerned comments on the aging aspect of our hobby in the responses, so it has been important to have been able to quantify this aspect.

You will no doubt pick on aspects of the analysis and flag this as more or less important to the future of the hobby and the RSGB. In analysing the data we have tried to avoid such personal preference or bias. Analysing the data and specifically the textual contributions shows that the hobby is very broad and that there are many diverse and at time conflicting interests and opinions. In strict statistical terms there are few conclusions in which we have what is termed confidence. One clear one is that parts of our HQ operation get a good report from members. Another is that, although we are not thinking of doing so, there is a clear message from our members that they would not want *RadCom* to be published only in an electronic format. As mentioned previously, many of the outputs from the analysis are, statistically speaking, trends. An interesting example of this is that whilst all age groups are active in what we termed 'general QSOs', there is a trend for this to be more pronounced at both the younger and older ends of our membership's age range.

Creating the questionnaire turned out to be quite complex and, despite extensive testing in late-August and September last year, we know that there were a few flaws in the logic and wording. Overall, the open-source *LimeSurvey* software was intuitive to set up and worked well – the whole survey cost nothing to put in place, run and analyse! I do though need to thank my son Ben for installing and administering the software using the existing *MySQL* database on the rsgb-spectrumforum.org.uk domain and to Dom Smith, M0BLF and Don Field, G3XTT for the many hours that they put into the analysis. My thanks also go to Bob Dingle, G0OCB and Roger Western, G3SXW, for their advice on statistics. Finally, I would like to acknowledge the running of statistical tests and expert comment on some of the findings by Chris Jewell, M0DWK.

John Gould, G3WLK

Analysis of the amateur radio survey questionnaire – http://www.rsgb.org/survey/analysis

LimeSurvey, the open source survey application – http://www.limesurvey.org

Henry Lewis, G3GIQ Silent Key

Henry compiled the 9-band table in *RadCom* for many years and, lately, for the RSGB *Yearbook*. He was an active DXer and a long-time supporter of the DXCC and IOTA programmes (he amassed very large scores in both, 336/371 in DXCC and 1058 in IOTA). Henry was a founding member of CDXC. He also served in the early years of RSGB's tenure of IOTA as an IOTA checkpoint and Committee Member. www.rsgb.org/g3giq.

NEW

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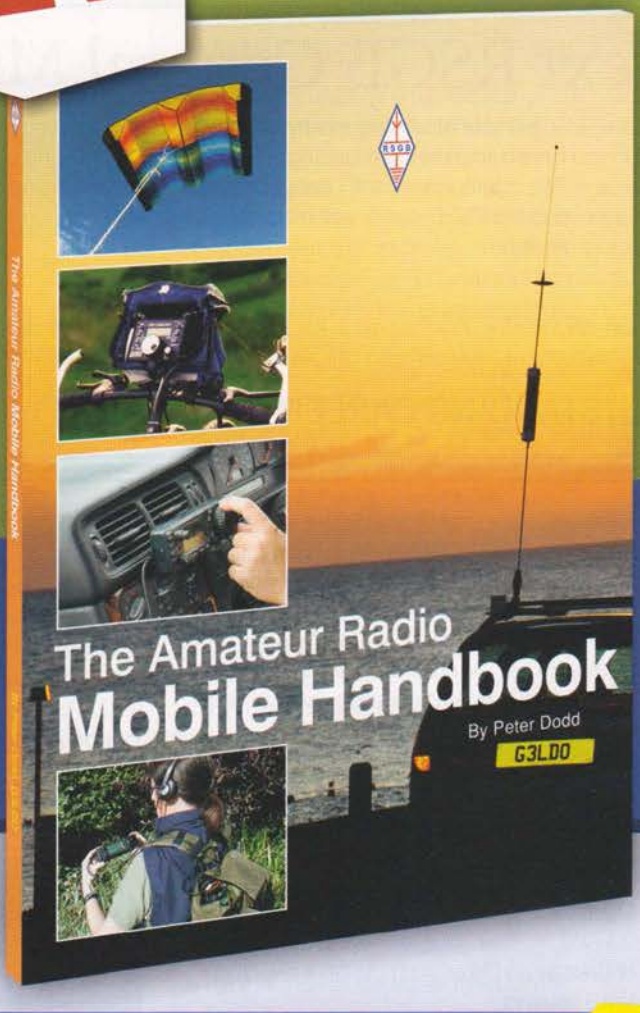

Amateur Radio Mobile Handbook

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

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If so, you may be the right candidate.

Please write with your CV to me, Dave Wilson, M0OBW, RSGB President, RSGB, 3 Abbey Court, Priory Business Park, Fraser Road, Bedford MK44 3WH or e-mail gmvacancy@rsgb.org.uk. You can also call me for an informal discussion on 07860 691 056.

THIS COULD BE YOUR OUTSTANDING CAREER OPPORTUNITY.

Fair Isle DXpedition

For a week from Tuesday 16 August, a group of WAB members hopes to be active from Fair Isle in the Shetlands. Whilst for IOTA purposes this counts as the Shetland Isles, EU-012, it is in the rare HZ 100 x 100km Ordnance Survey square for WAB purposes.

They will be travelling up to Aberdeen from the Midlands on Monday 15 August and hope to be mobile, using the callsign of G(M)7WAB/M. They have managed to negotiate getting their vehicle on the Fair Isle ferry on 16 August, however, they have a few hours on mainland Shetland before catching this ferry and, time permitting, hope to activate the islands of Trondra, East Burra and seven or so other WAB squares.

Operation from Fair Isle is planned on all bands from 160m to 2m, including 4m, on SSB and CW. Mobile and portable operation will be initially targeted at the WAB nominal net frequencies of 3.760, 7.160 and 14.265MHz, with portable operations QSYing once net members have been worked. They will be stopping in the South Lighthouse in WAB square HZ16, using the callsign GS4WAB. This location was chosen as the other 3 squares, HZ17, HZ26 & HZ27 are only a few hundred metres from there. The callsign GS7WAB will be used for operations other than from the south lighthouse. Time of landing on Fair Isle on 16 August is scheduled for 1410BST, so any operation that day will be late on.

Whilst this is primarily a WAB expedition, the trip does coincide with the International Lighthouse & Lightship Weekend and operation from both the south lighthouse (Skaddan) and the north lighthouse (Skroo) is planned. Upon their return to mainland Shetland on 23 August, they hope to activate the islands of Bressay and Noss and possibly a few other WAB squares.

For updates, please see the WAB website www.worked-all-britain.co.uk. For QSL details please see the respective entries on www.qrz.com.

Photo by kind permission of Dave Wheeler, www.fairisle.org.uk.

AMSAT-UK Colloquium to be Webcast

Thanks to the British Amateur Television Club (BATC), the AMSAT-UK International Space Colloquium, taking place 30-31 July, will be streamed live to the web.

Peter Blakeborough, G3PYB, President of BATC and other BATC and AMSAT volunteers will be streaming video of the event live, enabling it to be seen by radio amateurs and SWLs around world. Clearly a webcast cannot match actually being there with the opportunity to chat to satellite builders and inspect space hardware but if you can't get to Guilford then the webcast provides the next best thing. The webcast will be viewable at www.batc.tv.

AMSAT-UK will also be holding a Satellite Beginners' Workshop at 4pm on Friday 29 July to teach newcomers how to get started in the fascinating world of amateur radio space communications. With some satellites you can communicate using little more than a standard dual-band FM handheld. Others use SSB or CW and permit intercontinental DX communications using the VHF/UHF bands. The Beginners' Workshop will be run by Dave, G4DPZ and Carlos, G0AKI and takes place at the Holiday Inn, Guildford, GU2 7XZ. Look for the RSGB GB4FUN vehicle in the car park.

RSGB Visit

On 7 July Waters & Stanton welcomed the first ever visit to their offices of both the President and Acting General Manager of the Radio Society of Great Britain. Picture shows Peter Waters, G3OJV on the left, next to Dave Wilson, M0OBW, President, Don Beattie, G3BJ, Acting General Manager with Jeff Stanton, M3JJS on the right. Agreement was reached on closer co-operation between the two organizations.

Vibroplex Cabletidy

Having used various Vibroplex keys over his 53 years in amateur radio, G3LIV has always found that the cable connection to the keys never seemed tidy. Twisted cables or islet crimp on never looked acceptable to him.

He now has a new approach to the problem. His Cabletidy is a PCB in red or black with connections to suit the following Vibroplex keys: Iambic, original Bug and J-36. The PCB is double sided, plated through with silver plated holes and matching colour. It is terminated in a 4-pin mini DIN socket and a suitable high quality cable is supplied for rig connection. See www.g3liv.co.uk for full details.

GI HF Conference

West Tyrone Amateur Radio Club is holding an HF Conference on Saturday 20 August at the Technology Education Centre, Omagh BT78 1FA. A range of speakers from around GI, EI and G will be in attendance to share their various perspectives on aspects of HF operation. Confirmed speakers are John Corless, EI7IQ on HF etiquette; Paul O'Kane, EI5DI on DXpeditions and logging, with a demo of SD; John Breen, EI7BV on how amateurs got their bands; Malcolm Granville, GI8AFS talking about HF beacons, Michael Clarke, MI5MTC on a futterer's fun with QRP homebrew and Carlos Eavis, GOAKI speaking on IOTA.

There will also be traders in attendance such as Tyrone Amateur Electronics and JBT, along with exhibits from the RSGB and IRTS. The event is supported by *Practical Wireless*, TAE, JBT, IRTS and RSGB. More details at http://wtarc.co.uk/GIHFConference.aspx.

Advanced Distance Learning

Following the conclusion of their distance learning course with the recent Advanced exam, the Bath Radio Classes are planning to do it all over again. There have been a number of enquiries already so they have checked the exam dates, counted back and worked out that the next 'virtual' course needs to start in July. The aim is that students can sit the exam on Monday 5 December, either in Bath, or at their local exam centre.

There are no fees for the classes but students will need a copy of the RSGB *Advance!* textbook and will, of course, need to pay the exam fee of £37.50. Each week students will receive guided reading instructions and revision questions to test recollection and/or understanding. Tutors will mark e-mailed answers and will provide worked answers in return. Tutors will also provide points of clarification on request. The material is also supplemented by additional exercises and video demonstrations on YouTube.

Further details can be had from Steve Hartley, GOFUW, who is QTHR, listed on QRZ.com and can be e-mailed at GOFUW@tiscali.co.uk.

Steve would also like to hear from anyone that would be interested in becoming a remote tutor as he is trying to build up a network of mentors that can help share the workload, which is not great. However, more hands will make light work, and will add some resilience into the system. Contact details as above.

First OAM Signal Experiment

On 24 June, at 2138UTC, the first successfully transmitted and received orbital angular momentum signal took place in Venice. This new kind of transmission of radio waves is the result of the discoveries of the Venetian scientist and astrophysicist Fabrizio Tamburini from the University of Padua, in collaboration with his colleague Prof Bo Thidé, SM5DFW, of the Swedish Institute of Space Physics. This is the first public experiment carried out by Tamburini after laboratory tests carried at the CNR in Padua and in Uppsala Sweden.

The experiment consisted of the simultaneous transmission of two radio signals at the identical frequency of 2414MHz, one using a plain Yagi beam and the second using a specially-developed parabolic antenna capable of giving orbital angular momentum (also called 'vorticity') to radio waves. The two signals were successfully received separately one after the other without using multiplexing or any digital enhancements by one receiver connected through a splitter to two normal Yagi beams. The tuning consisted 'simply' of moving one of the two receiving antennas in the direction of the transmitted signal to catch the proper orbital angular momentum using for the first time the physical principle of OAM. Two carriers modulated with different audio pitches first and then two video signals were successfully received separately on the same frequency with no reciprocal interference.

Patron of the experiment was the Princess Elettra Marconi. The radio amateurs who took part in the experiment were Vittorino Boaga, I3BQC, Michele Del Pup, I3MDU, Martino Rizzi, IK3RIY and Francesco Carraro, IW3GSH.

Princess Elettra Marconi visited during tests, l to r Dr Anna Sponselli, Prof Fabrizio Tamburini, Princess Elettra Marconi and Prof Bo Thidé.

Eigg DXpedition

Members of Kilmarnock and Loudoun ARC visited the Isle of Eigg in April using the callsign MS0KLR. The team was Graham, MM0GHM, Allan, GM3OZB and Bill, GM3ZRT. It was a light weight DXpedition using wire dipoles and roach pole verticals with 100 watts. The radios were a Yaesu FT-100/D and an Icom IC-706 Mk2G. They were active on SSB, CW, PSK31 and RTTY on the 15, 20, 40 and 80m bands. A total of 641 QSOs were completed, the best being a contact with VK7AC on 80m.

Allan, GM3OZB, Graham, MM0GHM and Bill, GM3ZRT.

Icom ID-31E D-Star UHF Digital Transceiver

Icom provided visitors to the recent Friedrichshafen Ham Radio Show with a surprise by previewing a new UHF D-Star Digital transceiver. Called the ID-31E, it will feature the following:

- Built in GPS receiver
- D-Star DV/analogue FM mode
- DR mode user-friendliness improved
- Directional keypad navigation
- Full dot matrix display
- Slim compact design
- IPX7 waterproof construction
- Free cloning software download
- Micro SD slot

The unit shown at Friedrichshafen was only a mock-up of the ID-31E. At present there are no details of the launch date or pricing. www.icomuk.co.uk.

NEWS IN BRIEF

• The Royal Naval Amateur Radio Society has launched its new website. A feature of this replacement site is its simplicity and ease of use. All amateurs and anyone with an interest in maritime radio, especially those who have served or are serving in the Royal Navy, Royal Marines and other navies throughout the world, are invited to visit the site at www.rnars.org.uk.

Now that's what I call a radio shack

Each year the Bittern DX Group is allowed to set up an amateur radio station in the grounds of Oxburgh Hall in West Norfolk. Into this idyllic setting come enthusiasts into all sorts of wild and wonderful hobbies as part of 'Boys and their Toys' weekend. So alongside the Meccano builders, the model makers and the gents who chug along on their steam engines stood the Bittern DX tent, showing the varied aspects of amateur radio.

No one on the Bittern DX team would rate this alongside contest weekends. For one thing this year the bands and especially 80m were dead. It is a chance to engage with members of the public and to demonstrate the many different aspects of the hobby on offer. As usual there was a good deal of interest in the three working stations operating on HF, VHF and data. There were some excellent QSOs into the States and Ken, M6KAH even managed a VK on PSK31. Sadly these all occurred late at night when the public had left. During the day there was a good deal of interest from members of the public in the Foundation licence. Often people initially wandered into the tent to shelter from the torrential downpours that were a feature of the weather, but stayed to read the publicity about courses.

What the club always find surprising about this weekend is the large number of lapsed radio amateurs who come along. For many it comes as something of a revelation that they can now access the HF bands with their old Class B licence. At the other end of the age spectrum, CW is very popular with young people. Each year they find that this is what brings the families into our marquee and it is encouraging to see how many youngsters understand the rhythm and musicality of CW.

Thanks go to members of the Bittern DX Group for activating the station as part of Stately Homes and Castles on the Air and Boys and their Toys weekend. Despite fairly high winds and heavy showers it was enjoyed by all. Thanks are also due to the National Trust for allowing them to set up the equipment in their grounds and to be part of their programme.

RAYNET Group

Edward Rippon, M0EPR is interested in starting the Nottingham RAYNET group up again and would like to know if other amateurs would like to join him. The group will be for emergency communications primarily with training events taking place around Nottingham providing communications for local authorities with local events, horse trails, fun runs, Santa train as well as promoting amateur radio within the community.

Please contact Edward Rippon on 07974 491299 or by e-mail to m0epr.sarc@yahoo.com.

DX Station SMS

DX Station is an SMS text message service that alerts radio amateurs when the sought-after radio station's signal is spotted on the radio dial. In this internet age, the radio amateur hobby is still very popular, with millions of licensed amateurs around the world. To assist in tracking down those elusive radio signals from far-flung corners of the globe, DX Station operates a network of automated radio receivers, which constantly monitor the amateur bands for sought-after stations and then instantly sends a text message alert to those amateurs who have indicated their interest in contacting that particular DX station.

The use of real-time text messages gives subscribers to DX Station a competitive advantage, since they can hopefully contact the distant radio station before their colleagues join the fray. DX Station cannot guarantee that the radio amateur will be able to contact the distant station – that is down to radio signal propagation and the efficiency of antennas and transceivers of both calling and receiving radio station.

The DX Station text messaging service can be used on more than 800 mobile networks worldwide and the monthly subscription fee is paid by Paypal or credit card. These fees, which include a quota of text message credits, are used to maintain the network of automated radio receivers that the DX Station service relies upon for its operation. A reduced fee trial is offered for the first month of subscription. Alert profiles are managed via a user-friendly interface on the service website at www.dxstation.com.

PLT Debate

If you have access to a broadband connection you may be interested in listening to the Parliamentary debate on Power Line Technology: http://news.bbc.co.uk/democracylive/hi/house_of_commons/newsid_9488000/9488932.stm.

£2,652.74 presented to the RNLI

At the Norbreck Amateur Radio Rally, held in Blackpool in April, the Lifeboat Amateur Radio Society presented the RNLI with a cheque for £2,652.74 – the amount raised during this year's SOS Radio Week. Despite difficult economic and financial times, participants in the fund-raising event worked extremely hard to raise this fantastic amount and Elizabeth White, RNLI North, passed on the thanks of the RNLI to all who took part.

The SOS Radio Week organising committee has announced this year's prize winners. The Icom Group Award went to the group that raised the most money for the Royal National Lifeboat Institution during SOS Radio Week 2011 – Merion Amateur Radio Society, with a total of over £833. The group will receive an Icom ID-E880 D-Star dual band mobile transceiver. The Icom individual award went to the individual that raised the most money (over £240) – Malcolm, G3NZP – and he receives an Icom IC-E80D D-Star dual band hand-held transceiver. The SRC Young Persons Award went to Rebecca Hughes, M6BUB, for her most professional approach to the event, belying her age and the fact that she had only been licensed for a couple of months. For her efforts Rebecca will receive an antenna from the Snowdonia Radio Company range.

All participating stations that have not received one of the above awards were entered into a prize draw and the successful participants won the following prizes:

- A Digby, G0JLX - Wouxun KG-679E 2m handheld transceiver from Martin Lynch and Sons
- David, G4BKE - SE-1300 Discone antenna from Sigma Euro-Comm
- Paul, 2E0EAN - Superior G5RV HF antenna kit from Sigma Euro-Comm
- Mr Ehm, M0ZAE - Superior G5RV HF antenna kit from Sigma Euro-Comm
- Patrick, G6HOF - Superior G5RV HF antenna kit from Sigma Euro-Comm.

Dayton Hamvention Music

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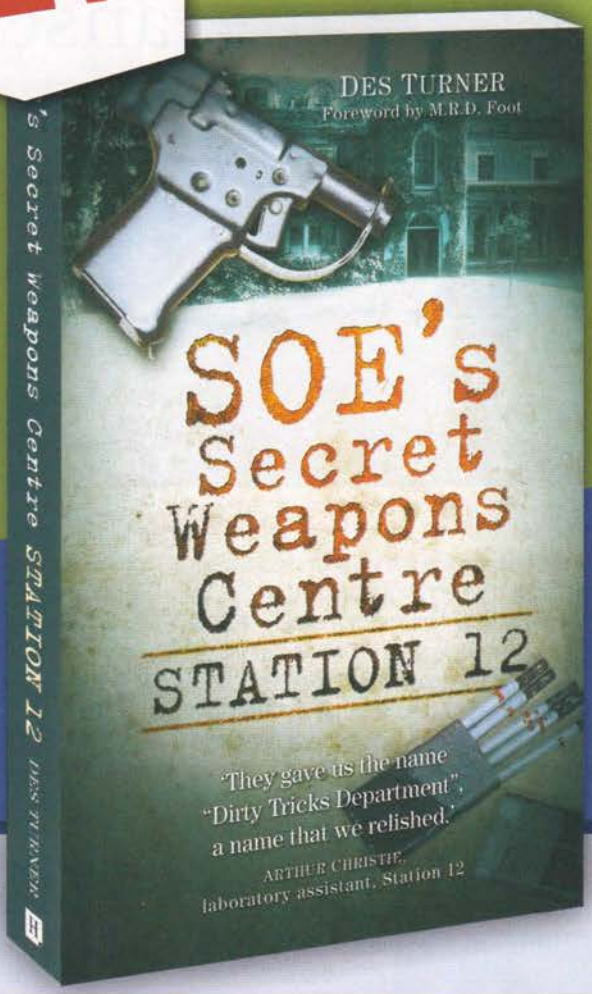

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The CRT SS6900 10m transceiver

The CRT SS6900 10m radio is new to the market.

MAKING USE OF Es. With the sunspot cycle finally getting under way and with the Sporadic-E (Es) season also in full tilt, many amateurs are turning to 10m (28MHz). Seemingly completely empty for most of the time, with the solar flux index now often above 100, 10m is finally starting to wake from its slumber. And with strong stations romping in from around Europe on virtually a daily basis thanks to summer Es this seemed like a good time to take a look at a new 10m transceiver.

The CRT SS6900 10m Radio (to give it its full title) is a new design that is attracting a lot of interest. The Far-East-produced radio is available under a number of different brand names and a first glance shows its CB origins. But to dismiss it out of hand because of its 27MHz connections could be a mistake.

This radio is well specified, has a full digital display and can be fully programmed with a dedicated USB lead and PC program, but on the review model you had to take the covers off to plug in the programming lead.

As supplied to me, the radio covered the 28.000–29.700MHz amateur band. It offers full CW/AM/FM/USB/LSB capability at 12W (AM/FM/CW) output and 21W PEP on SSB. A few minutes with the programming software and the radio can be on any part of the 10-11m band.

The radio comes complete with a mounting bracket, microphone, 12V lead and instructions. As supplied it also came with the required programming lead and the software on a CD-ROM.

Taking it out of the box, my first impressions were that it is quite well made. The radio measures 200mm wide by 58mm high by 275mm deep and weighs 2.8kg. Note that the microphone plugs into the left side of the case so allowance must be made for this if you are trying to fit it into a tight spot.

It requires a 12V supply and draws a maximum of 6A. The supplied 12V lead is only about 1m long and you may struggle a little if fitting this in your car, although it was fine for a home installation.

ON THE AIR. On first switch on I was greeted with a bright, clear orange display with a smaller very bright blue channel number display (which is largely redundant unless the radio is being used as a CB).

From left to right the controls are On/OFF and volume combined, with concentric squelch, and then a so-called 'E-Tone', which is actually an echo effect, which is best left switched off! Next to that are RF Gain/RF Power and then the bandswitch.

The radio has a six position band switch that came with the 10m band pre-programmed in six banks of 60 channels. That is, position A covered 28.000 –28.295MHz, B covered 28.300 – 28.595MHz. C covered 28.600 – 28.890MHz, D covered 28.900 – 29.190MHz, E covered 29.200 – 29.495MHz and F covered 29.500 – 29.700MHz (41 channels).

The only bugbear was that the channel step was 5kHz, which is too coarse for most applications, apart from the FM portion of the band around 29.600MHz.

By the way, the radio came with a -100kHz repeater shift automatically enabled on the 10kHz channels between 29.610 – 29.690MHz.

The other major controls are the mode switch and a clarifier. There is also a set of eight buttons that control everything from the noise blanker, 'roger bleep', dual watch, scan and much more.

The scan function scans a whole 'band'. In practice this means scanning each channel in a single band in turn.

Pressing the function button momentarily allows you to get the function marked underneath the buttons – such as LCD off, SWR meter, hi-cut interference filter and more.

Pressing and HOLDING the function button brings in a whole new set of functions, such as choosing whether the clarifier switch works on RX only, TX only or both.

The menus also allow you to set other functions, including the CW side tone frequency, high SWR warning, transmit timeout timer, scanning type and much more. I suggest you sit down and read the manual to get the most out of the radio.

By setting the clarifier to be operative on both Tx and Rx you can navigate around the band in between the 5kHz channels. Out of the box the clarifier was set at 100Hz increments, requiring ten clicks to step up or down 1kHz. This is probably a little too slow, but setting it at 1kHz made it too coarse.

Strangely, the clarifier only lets you step up or down + or – 10 steps when set to 1kHz, so you could tune, say, from 28.490 – 28.510MHz if tuned to 28.500MHz.

If set to 100Hz you can tune up or down as many steps as you wish, which makes it more user-friendly.

The radio seems to remember what clarifier settings you have used on each channel. This can result in some bizarre effects whereby I stepped up through the band in 5kHz steps, only to find that I actually ended up going back at one point and then forward the next.

This is because I had wound on a few kHz using the clarifier on one channel, but had failed to put it back where it belonged afterwards – all a little confusing! The solution is to make sure you put the channel back where it belongs (with the clarifier) when you have finished.

You can also easily miss stations when clicking through the band in 5kHz steps, so it is best to use both the main channel switch and the clarifier in conjunction with each other. The alternative is to reprogram it with 1kHz channels, but then you would only be able to cover a maximum 6 x 60kHz = 360kHz.

Another solution is to perhaps program the FM frequencies in 10kHz steps on Band position F, and then add your favourite SSB or CW sections of the band in 1kHz steps on the other band positions.

You can program six bands of up to 60 channels.

COBRAWORXSHOPZ COMMENTS:

The SS6900 supplied was the first SS6900 in the UK and was straight 'off the shelf' as such. The radios that we supply will have a few modifications:

We have engineered a modification to incorporate a six-pin mic socket rather than the four-pin, which enables the radio to be programmed without removing the covers and have modified the data cable so it can be plugged into the new six-pin socket.

The 5kHz channel step is actually a huge improvement over the industry standard 10kHz. The clarifier actually has four modes of operation, including a 'shift' function. When the clarifier shift is enabled it makes it possible to cycle through each digit on the display and change, eg 10Hz, 100Hz, 1kHz, 10kHz, 100kHz etc. This means you can dial-in any frequency you wish very quickly.

The CW side tone and key press 'beep' (which uses the same circuit) has now been modified to a much more reasonable level (single resistor change on chassis), making it really easy on the ears. The SSB signal meter has also been modified (single resistor change on the chassis) to make the sensitivity more damped.

We have several other mods, some of which have been sent to us marked 'confidential' from the factory for other niggles, but once all of the above have been ironed out, the radio is really good to use and is a marked improvement over any other monoband 10m transceiver sold to date (in our humble opinion).

I tried the programming software – I had to take off the radio's covers and plug the programming lead into the motherboard (but see the comments from the supplier). The USB connection defaults to COM3, which could be a problem if you have a lot of other COM ports.

Once connected you can 'read' the channel programming from the radio, change it to what you want and upload it again. This is quite easy, albeit a little long-winded if you are doing a lot of channels as you have to specify both the TX and RX frequencies. While in the programming mode you can change a lot of other functions, such as disabling the PA function, restricting the modes and switching on the high SWR alert.

The microphone has up/down buttons that step through the channels and a button marked 'AQ', which is an automatic squelch – very handy for 10m FM use.

On the back are the SO239 antenna socket, a large heat sink, the power socket, and 3.5mm jacks for an external speaker and a Morse (straight) key. One thing it does lack is CTCSS (Continuous Tone-Coded Squelch System), which may limit its use on some 10m FM repeaters.

OPINIONS. So, ergonomics out of the way, how well did the radio work? I started off by setting the radio on the International Beacon Frequency of 28.200MHz. Using the CW setting I was soon hearing the 4X6TU beacon in Israel and the ZS6DN beacon in South Africa. Neither were particularly strong, but they were no better on my main radio (which costs about 10x more).

The radio's microphone lets you change frequency and operate the auto squelch.

I had to wait a day or two before I was to hear anything else on the band. When it did eventually open it was full of signals from Europe via Es.

The rig's front end is quite wide and I often found signals on the 5kHz channels that were tracked down to frequencies in between. Selectivity is adequate rather than outstanding as it was possible to pick up strong repeaters 10kHz away from their actual frequency. The S-meter is digital and jumped around dramatically on SSB, making it hard to give accurate reports – it could do with some damping (see supplier's comments).

I heard or worked SSB stations in Italy, Slovakia, Russia, Spain and Poland – some with a little difficulty due to having lower power than a main station rig and competition from other callers.

I also made contacts on FM and was able to hear many 10m repeaters (some with no idents) on 29.620MHz, 29.650 (HB9HD – Luzern), 29.660 (DM0SAX – Hartha in Saxony), 29.670 and 29.690MHz.

Reports said that the audio was fine and I quite enjoyed rag chewing with other hams, including G0YNM and MI0VKO via HB9HD on FM, complete with its Swiss musical box ident.

The most up to date list of EU 10m repeaters I could find was an Excel sheet at http://lnx.arimi.it/wp-content/uploads/2010/10/Europe-10m-repeaters-list-07-nov-2010.xls.

The FM auto squelch setting proved a little too vicious – cutting the signal when it was still very audible but noisy, but non-adjustable auto squelch can often be a pain. On CW the sidetone was LOUD – far too loud, to be honest, as the kids commented on it – even though they were upstairs! With headphones on you would damage your hearing. This has been adjusted in the final models apparently.

If you are looking for a mobile 10m rig that doesn't cost the earth the SS6900 should be on your list to check out. As supplied, the 5kHz SSB channel spacing was frustrating, but there are ways around this. On FM it was flawless.

The CRT SS6900 10m transceiver costs £189.00 + postage, which includes a two-year warranty, from Cobraworxshopz (www.cobraworxshopz.com), 07508 148 148. Our thanks to them for the loan of the radio.

Antennas

A magnetic loop automatic ATU

PHOTO 1: The complete BRATS project magnetic loop auto tuner control unit.

MANUALLY TUNING A LOOP. In spite of the controversy regarding the efficiency and effectiveness of small magnetic loop antennas in the past, I constantly receive e-mails to the effect that this type of antenna has solved an HF antenna problem.

The high Q of the magnetic loop means that its usable SWR bandwidth is only a few kHz wide; retuning is necessary whenever the frequency is varied. Some amateurs consider this need for retuning to be a disadvantage of the magnetic loop and that adjusting the tuning can be tricky. However, this sharp tuning is a consequence of the magnetic loop's high Q, the factor that makes it so efficient for its small size.

BRATS RADIO CLUB PROJECT. It was with interest that I read an e-mail from Geoff Wooster, G3YVF, in which he described his involvement (with two other members of BRATS Radio Club **[1]**) in designing an auto tuner for magnetic loops, thus circumventing the tuning problem described above. The automatic ATU uses a stepper motor, a homebrew design laser cut variable capacitor together with a kit of parts. Many members of the club have built magnetic loops plus the auto ATU to complete the project. The tuner is designed to work with a magnetic loop constructed to operate in part(s) of the range of 1.5 to 30MHz; the tuner should be able to operate from RF powers as low as one or two watts up to around a hundred.

Charles, G4VSZ, and John, G8JAD started the club project for BRATS in 2008 and were joined later by Geoff, G3YVF. John, G8JAD, wrote the PIC software. The team made their own PCBs and even the strip line VSWR sensors in house, building the complete automatic ATU for only a few score of pounds. The finished project in its box is shown in **Photo 1**. Obtaining suitable variable capacitors for magnetic loops can be a challenge but the BRATS team solved the problem by designing and building their own tuning capacitors from scratch. An example is shown in **Photo 2**.

A reduction drive is required because the tuning of the loop is critical. Direct drive from the motor to the capacitor is not a problem if the capacitor has a small value, say 50pF, but a reduction drive is needed if the capacitor is larger, otherwise the increments will be too big. An insulated shaft from the motor/reduction drive to the tuning capacitor is essential.

OPERATING THE ATU. As shown in Photo 1, the control unit has simple controls: a power switch, auto/manual tuning selection and, on the left side, pushbuttons for fast/slow up/down control of the stepper motor. In addition there is a row of LEDs to indicate the 'dead band' setting. This dead band is the SWR range over which no tuning occurs. It prevents activation-deactivation cycles (hunting) of the automatic system. The reason for having a variable dead band is to allow the ATU to match to the minimum SWR achievable on the loop to which the ATU is connected.

The width of the SWR bandwidth is indicated by the number of LEDs lit from the left, ie four LEDs would indicate an SWR dead band of 1.9:1. The default setting is 1.4:1 (two LEDs illuminated).

By pressing two of the manual buttons at once the SWR display can be scrolled and left at the desired auto tune SWR setting. Pressing one of the buttons again stores this in the PIC for use on the Auto setting.

You might question why it's important to have an 'infinity' dead band setting. G3YVF tells me that the LED display had to end somewhere and it got called 'infinity' because it is off scale! The LED display is really only intended to give the operator some confidence. It also allows one to set up the ATU to any new loop. This is done by adjusting the loop capacitor manually on the SLOW setting to observe the lowest SWR figure that can be obtained; this figure is then used when setting up the ATU in automatic mode.

It has been found that if you QSY only a small amount, the tuner will tune so fast on seeing RF from the transmitter that you can miss the fact it has re-tuned. If it needs to do a full sweep to find a new setting, this can take 8 or more seconds, depending on where the tuning capacitor was to begin with. There are no stops on the loop tuning capacitor so it can rotate round and round. The stepper motor runs from the 12V DC fed to the tuner; this is just enough to rotate the capacitor.

Loops fed with a balun appeared to perform best with the tuner, with the flying leads from the balun being connected equidistant from the mid point of the loop. The actual connection points were found by testing whilst watching the SWR to locate the two 'sweet spots' on the loop.

Interestingly, the tuner will sense and tune with ease with powers from 100W to below 1W. Also note how the strip line PCB sensor is screened from the main PCB (**Photo 3**). There is only one known issue: if your transmitter has spurious outputs, ie on more than one frequency, it will confuse the tuner. This would not normally be a problem with a loop antenna due to its very high Q (almost single-frequency operation), which naturally rejects off-tune signals.

CONSTRUCTION. There is no kit of parts available, but a comprehensive set of building instructions in PDF format can be found at [1]. These contain building instructions, PCB layout of the main board and the sensor, capacitor construction and schematic. I found these very well written. The instructions do include a caveat that this is an experimental project and you must be prepared for setbacks, but I am told they are not aware of any up to now.

The BRATS PCBs are designed the other way up compared with the conventional method of having the tracks on one side and the components on the other. This method allows the constructor to see the track and solder components directly to it. It's less critical regarding component type and appears to be a very good method of making PCBs for homebrew projects. As you can see from **Photo 3** the layout is neat and practical.

The PIC firmware is also available from **[2]**. Be aware that the intellectual rights of this firmware belong to John, G8JAD. While this has been made freely available to *RadCom* readers it is not for commercial use.

OTHER ISSUES. The performance of the system will depend on the construction and location of the antenna. G3YVF uses a 50ft circumference loop made from 22mm copper water pipe and compression fittings. Situated

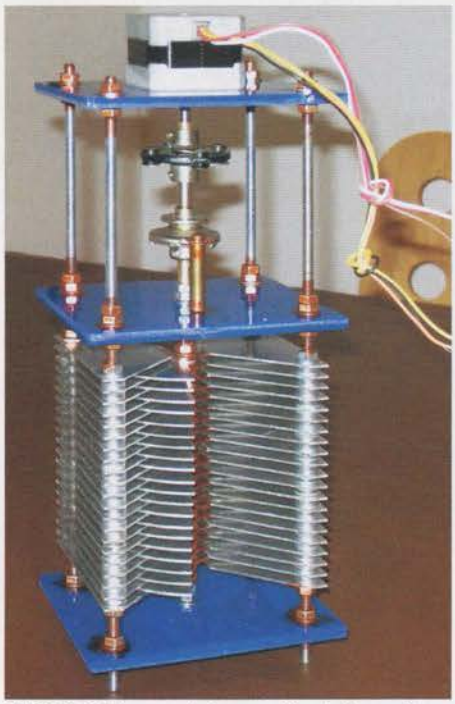


PHOTO 2: The complete capacitor tuning unit with the stepper motor and the slow motion drive designed by the BRATS team. Note the ball reduction drive and the insulated shaft between the reduction drive and the capacitor.

in the loft, it tunes both 80 and 40m with the 150pF variable capacitor shown in Photo 2.

When used on 80m, the auto tuner will retune to any new frequency in a split second. He adds that he can often hear 80m stations on the loop that cannot be heard on his sloping 66ft vertical (and he lives on an island with a sea earth at the bottom of the sloping vertical).

Note that you cannot retro fit this auto ATU to a loop controlled by an AC/DC motor without changing the capacitor drive to use a stepper motor. Note also that the tuning capacitor designed for the project has 360 degrees of rotation and has no mechanical stops.

It seemed to me that there could be further uses for this auto ATU. For example, with my mobile setup I have a screwdriver antenna,

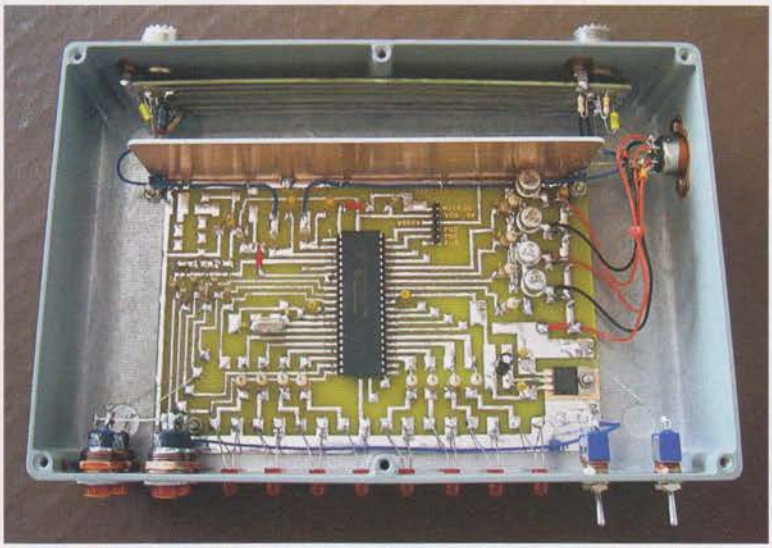


PHOTO 3: The general construction of the BRATS automatic loop tuner. Note the method of soldering the components to the track side of the PCB.

which works OK but is very critical to tune. It occurs to me that this ATU could be beneficial because trying to make critical adjustments to radio equipment while driving a vehicle could be hazardous. I put this to G3YVF, and he replied "Oh yes, we have a couple of members who are looking at all sorts of things. It does not matter one jot to the electronics if the capacitor drive stalls. The stepper will only draw current according to Ohm's Law and its resistance is high. This will never cause either a motor failure or driver transistor failure.

"You can use it for an L match ATU. Use a switch so the variable capacitor can be put on input or output. It rotates in one direction only and will find a match.

"When mobile with a screwdriver antenna, use the manual buttons to run it to one end – a stall does no damage. Now switch to auto. Your screwdriver will be tuned as soon as you squirt some RF into the ATU.

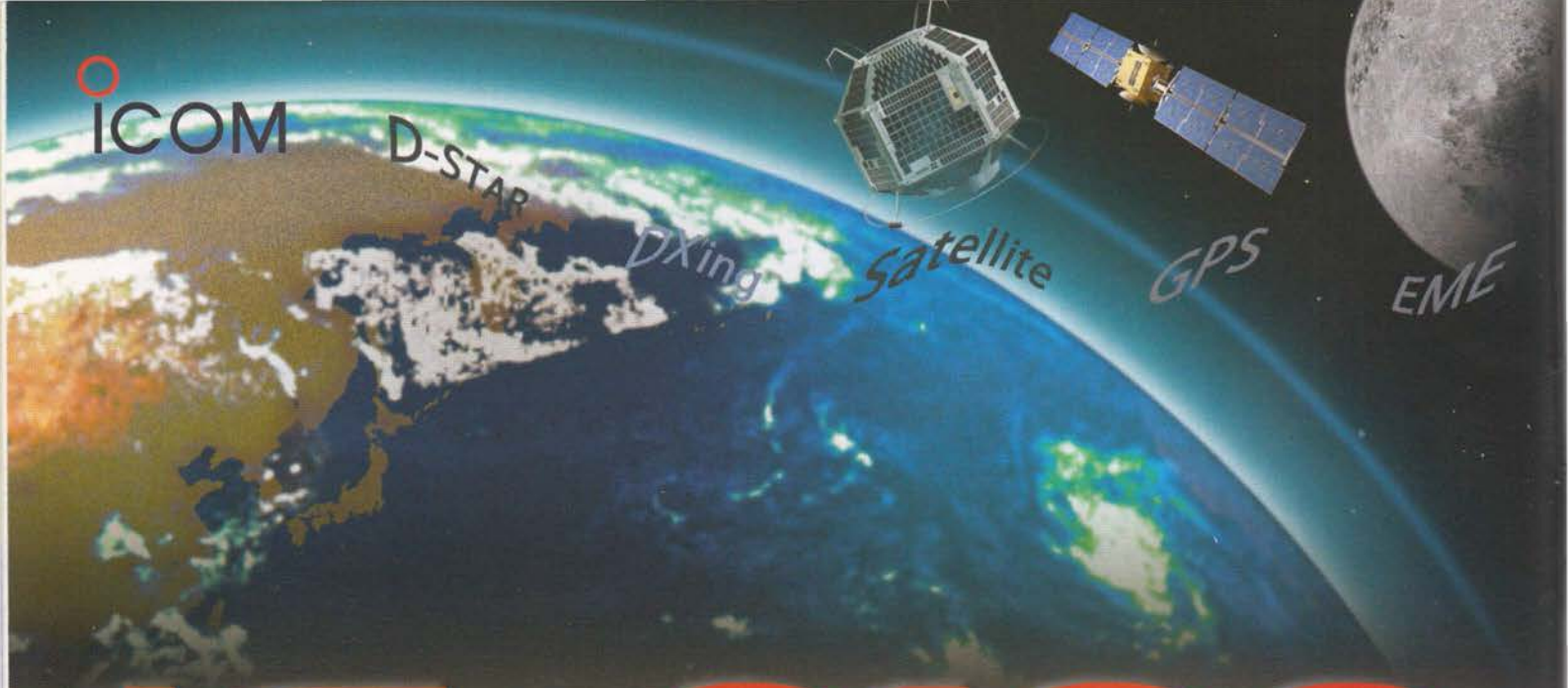
"This hasn't yet been tried, but you could build a T match ATU where both variables and roller coaster are on one shaft. Manually set it one end of travel. Now go to auto and transmit. It looks interesting, as every revolution brings the T match closer to a match. Think about it. A T match ATU where roller coaster and variables rotate all at once. This one is good but might require a stronger stepper or higher supply voltage as more power will be needed.

"I am sure there is spare I/O on the PIC. We were going to make it remember the frequency and where it went to match the loop, for a quicker auto tune. RF on the board caused a bit of trouble and so we dropped this. Some one out there might like to tinker with the program and make it go in reverse for a second before it goes forward to try and match. This would enable a QSY feature. We never fully mastered it because it tended to go unstable on us.

"At 12V operation the stepper has just enough power to do what we asked of it. Fit for purpose. If your variable capacitor does not turn freely then a bigger motor might be needed. BFY51s will switch a lot more current than we asked from them for the stepper motor we used." You may well need a bit more 'oomph' if you were driving a vacuum capacitor to tune the loop.

REFERENCES

[1] www.brats-qth.org
(you need to be a member to access the project files)
[2] gw.woo@btinternet.com
[3] g3ldo@o2.co.uk



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Homebrew

Some more on noise – and a few loose ends

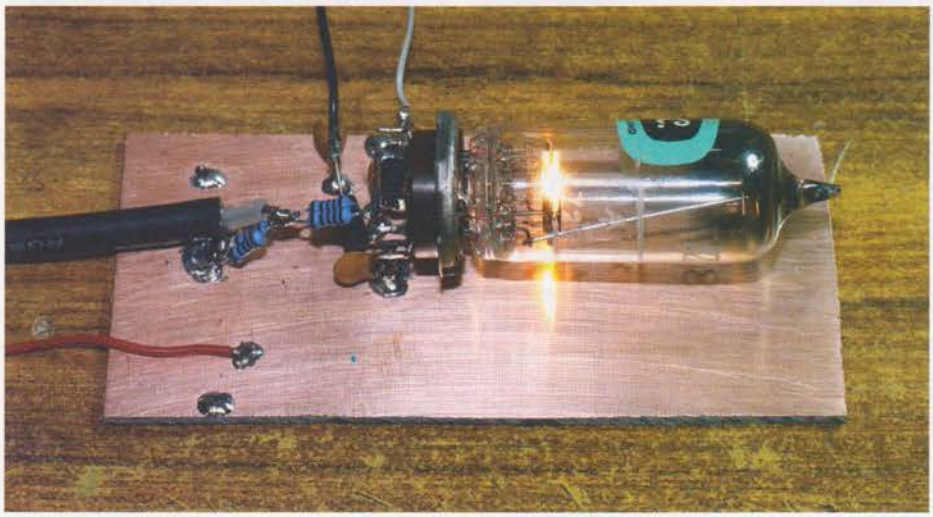

PHOTO 1: My prototype thermionic noise source, based on an A2087 noise diode.

TIME OUT. Before we resume work on the HF transceiver project, I would like to tidy up a few loose ends from last month's Homebrew. Since last month, I have acquired an A2087 [1] thermionic noise diode. This was used to build a HF/VHF noise source. When the A2087 is used with a 50Ω source resistance and a 100V DC supply, it can produce excess noise ranging from zero to 13dB. Higher noise output can only be achieved by using a higher source resistance or exceeding the maximum dissipation rating of the valve. Excess noise output is 10LOG(20*Id*Rs)dB, where Id is diode current in amperes and Rs is source resistance in ohms. For the standard source resistance value of 50Ω, this is simply 10LOG(Id)dB, where diode current is in mA. **Table 1** shows a few values of excess noise for a useful range of diode current.

The circuit is built in three sections: the A2087 noise source, the variable supply for the heater filament and the 100VDC HT supply. The circuit of my prototype noise source and heater supply is shown in **Figure 1**. The noise diode and its output circuit are arranged in a positive-ground configuration. This allows for the simplest possible configuration of the most critical part of the circuit. The anode circuit consists of just two 50Ω resistors and a coaxial socket. The minimal component count and very small values of stray reactance will ensure that the noise source performs predictably from HF to 220MHz without the need for frequency compensation. But the positive-ground configuration makes it more difficult to supply the heater filament voltage. The A2087 has a directly heated cathode, which means that the heater supply of around 3-4V must be connected directly to the negative HT supply of -100VDC.

The HT supply comes from a standard 0-18V, 0-18V transformer. The two 18V secondary windings are connected in series give an output voltage of 36V RMS, or almost 51V peak. A simple voltage doubling rectifier gives a voltage of just over 100VDC. The exact voltage isn't all that critical. Any transformer with a total secondary voltage in the range 35-42V should be suitable. The maximum anode dissipation rating for the A2087 is 2W. When the supply voltage is 100V, this limit is reached at a diode current of 20mA. To ensure good voltage regulation of the HT supply, you should use a transformer with a power rating of several times this value. 6-12VA is just about ideal. The HT supply is shown in **Figure 2**. I used a pair of 1N4007 diodes for the half-wave, voltage doubling rectifier. Other high voltage rectifiers like the 1N4004/5/6 would also be suitable for use in this circuit. The smoothing capacitors are a pair of 220μF, 160V electrolytics. These were used because they were readily available. Smaller values of 100μF or so should be perfectly adequate provided the capacitor's voltage rating is high enough (about 80V).

You must ensure that excess noise appearing at the output of the noise source is coming from the noise diode and not from any external source. A fused and filtered IEC mains socket will help to keep RF from local broadcast stations from getting into the noise source enclosure. The noise diode may be mounted in the same enclosure as the filament and HT supplies or it can be housed in a smaller box that is connected to the main unit via a screened multi-core cable. As there are relatively high voltages involved, this approach could lead to a shock hazard under some circumstances. 100V is a potentially lethal voltage: people have been killed or seriously injured by less.

CONSTRUCTION. The noise generator is shown at the top of Figure 1. I built the circuit in the usual dead-bug style on a strip of PCB laminate. **Photo 1** shows my test circuit operating. I used two parallel pairs of 100Ω, 1% tolerance metal film resistors as the 50Ω resistors in the anode circuit of the noise diode. A B7G valve socket was used for the A2087. All component leads and ground connections should be as short and direct as possible.

The filament supply is built on a separate strip of PCB. This circuit generates a DC voltage ranging from 0V to just over 4V. The entire circuit is at high voltage. All parts of the DC side of the unit are connected to the -100V DC supply (note the minus sign). This is shown inside the red box in Figure 1. *The live circuit includes the heatsinks for the 5V regulator and the NPN power transistor. The wires to the filament current adjustment pot are also 'hot'.* The entire power supply should be built into an earthed metal enclosure. The 7805 regulator should be fitted with a heatsink capable of dissipating several watts. Alternatively, the regulator can be bolted to the aluminium enclosure using a thermal insulation kit. Make sure that the 7805 heatsink tab is well insulated from the grounded enclosure. The thicker ceramic type of insulation kit is less prone to insulation failure. Maximum dissipation in the NPN transistor used to control the heater current is about 1.2W. This component will also need a heatsink. I used a 2SD880 NPN power transistor in my prototype. Similar NPN power transistors with hFE of around 100 would be equally suitable. The TIP41C should make a good substitute. I used a standard 1k linear pot for filament current adjustment. A 10 turn type would make fine adjustment a lot easier.

TESTING. I used a digital multimeter in series with the positive HT lead for measuring the

TABLE 1: A2087 current vs excess noise.

Id (mA)	Noise (dB)	Id (mA)	Noise (dB)
1.12	0.5	5.01	7
1.26	1	6.31	8
1.58	2	7.94	9
1.99	3	10.0	10
2.51	4	12.59	11
3.16	5	15.85	12
3.98	6	19.95	13

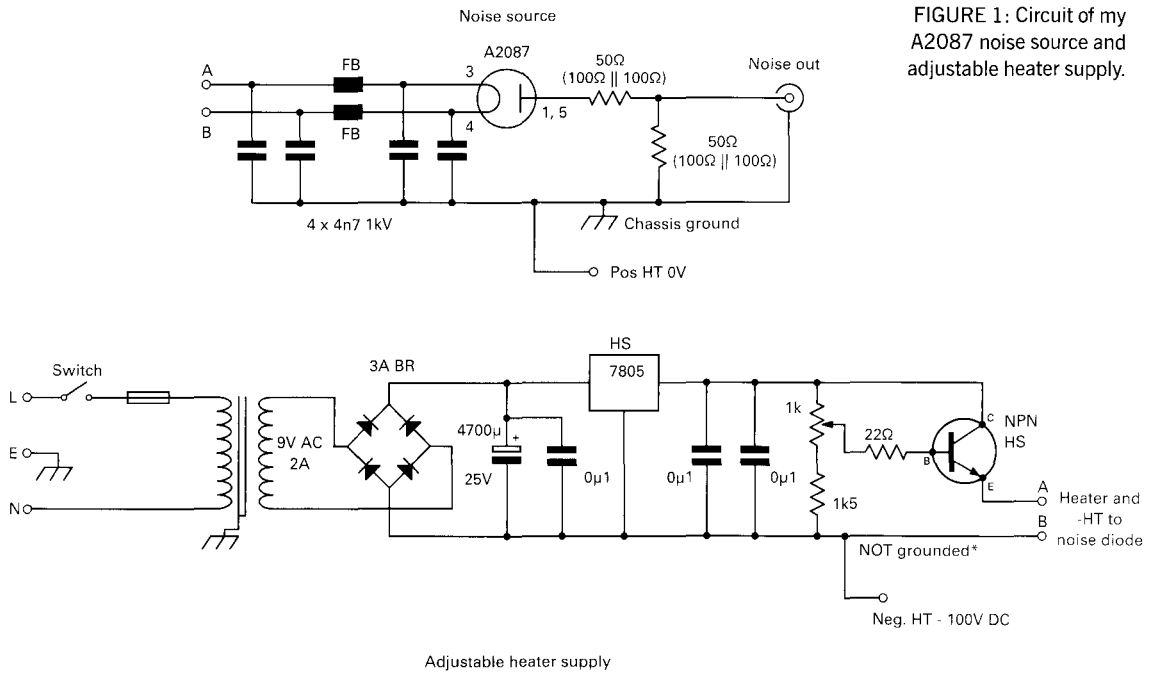

FIGURE 1: Circuit of my A2087 noise source and adjustable heater supply.

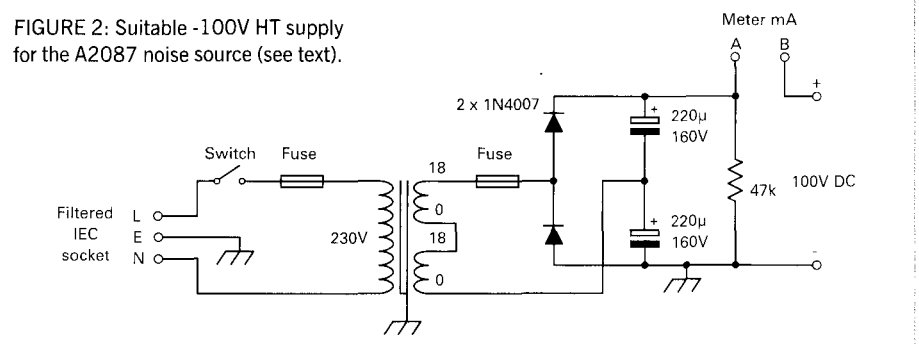

FIGURE 2: Suitable -100V HT supply for the A2087 noise source (see text).

noise diode current. If you use a moving coil meter for this purpose, it should be a very large meter with high resolution and accuracy. Current measurement error will lead to inaccurate noise figure values, particularly when measuring very small values of NF. When measuring NF by the twice-power method, a diode current of 1.2mA would indicate a NF of 0.79dB, 1.3mA would indicate 1.14dB. Measurement errors are less significant for higher values of NF in the 7-13dB range.

The A2087 has a specified life of 1000-2000 hours at 5mA. Increasing diode current to 20mA reduces the valve's life to a mere 100 hours. My noise source has a diode current range of 0mA to 14mA. This allows NF measurement up to 11.46dB. The NF range can be extended to the permissible maximum of 13dB by replacing the 7805 regulator with a 7806. I decided to use the 7805 because it prevents me from accidentally exceeding the dissipation limit of the A2087.

I used the noise source to measure the NF of my 2m receiver. With the AGC disabled, I used a true RMS voltmeter to measure the AF output from the receiver. The noise source was connected to the receiver input by a very short coax lead. AF noise at the receiver output increased by 3dB when the noise diode was powered up and diode current was increased to a value of 2.14mA. As the shack temperature was a very convenient 17°C at the time, this indicates a NF of 10log (2.41) = 3.82dB (assuming zero losses in the cable and connectors between the source and the receiver input). This is slightly better than the NF of 4.1dB measured last month. The two measurements are closer than I expected, given that the previous value was based on noise power measurements using an uncalibrated spectrum analyser.

Unlike the semiconductor diode noise sources described last month, the valve noise diode is a low current, high voltage, high impedance device. This means that the source impedance is almost entirely defined by the 50Ω resistor in the output circuit. The measured cold source return loss (RL) of the noise source is better than 30dB (SWR 1.05:1) from LF to 200MHz. Replacing the 0.25W metal film resistors with parallel pairs of 100Ω 1% type 805 SMT resistors improved return loss to 40dB (1.02:1). The increase in RL when the source is powered up (hot-source) to 10mA/10dB is insignificant, to the extent that it is barely measurable. Note that there is no RF coupling capacitor at the output of the noise source. If the 50Ω source resistance were to fail open-circuit, a DC voltage of up to -100V could appear at the output connector. As this is from a high source impedance of several thousand ohms, it probably won't do you any harm, but it might fry your nice new GaAsFET preamp. This risk can be eliminated by putting a 10nF capacitor with a high voltage rating between the source resistor and the coax output connector. Improved safety comes at the price of increased stray reactances in the output circuit. As this is a fairly unlikely failure mode, I decided to connect the source resistance directly to the output socket.

The new thermionic noise source will be used as an accurate reference to calibrate the semiconductor noise sources from last month's Homebrew. As the valve noise source will only be needed for occasional calibration checks of the semiconductor noise sources, hopefully the diode valve will provide many years of service. At the time of writing, the A2087/CV2171 is available from tube-shop.com at £16.50 plus p&p. Despite the name, this is a UK company. Other similar noise diodes can be used. It may be necessary to modify the filament supply circuit if you use a different device.

LOCAL OSCILLATORS: I have been rooting through the EI9GQ junk box looking for suitable devices to use for the local oscillator section of the new HF transceiver. My old rig uses a band-switched VFO that was free running (too darn free!) in my original prototype. I later added a simple PIC based 'huff & puff' frequency stabiliser. Readers interested in the huff & puff technique should visit www.hanssummers.com where you will find a large collection of huff & puff articles including the original huff & puff article by Klaas Spaargaren, PA0KSB.

My first huff & puff stabiliser was a PIC implementation of the classic huff & puff circuit that is basically a 1 bit frequency counter. This configuration worked brilliantly for reception, but it was less than ideal for transmitting. The stabiliser 'locking points' were separated by about 10-20Hz. When the VFO was tuned to a new frequency, it would drift to the nearest locking point and then stay there. This scheme allowed me to tune to within 10Hz of any frequency on any HF band. The problems began when I started using the transmitter.

Every time I switched from receive to transmit, the slight change in supply voltage and the mechanical shock of the relays caused a very slight frequency change of about 10Hz. This would normally be an insignificant change. However, it was just enough that it sometimes pulled the VFO frequency down to the next adjacent locking point. The receiver would remain locked on frequency for hours, but as soon as I started transmitting, the frequency would walk downwards in 10Hz steps.

My second attempt at building a PIC based VFO stabiliser was more successful. This used the PICs built-in counter/timer to measure the frequency of the VFO to a resolution of 24 bits. The single bit count of a simple huff & puff just gives a high/low indication relative to each locking point. The 24 bit counter gives an accurate frequency with a maximum value of 2^{24} = 16,777,216Hz for a 1s gate time or 167.772MHz for a 100ms gate time. The adjacent locking point concept still applies, but the locking points are now 167MHz away from the locked frequency. This stabiliser was based on the PIC16C54 and it was published in *Elektor* **[2]**. I am currently using a similar stabiliser based on the reprogrammable PIC16C84 (and F84) **[3]**. This unit displays the VFO frequency to a resolution of 10Hz and indicates the lock status. Frequency correction is applied to a varicap diode in the VFO. This allows the VFO frequency to be slowly steered by about ±2kHz. It cannot correct more extreme drift, nor can it track rapid changes in frequency. In short: it can't make a good VFO out of a really bad one but it can make a good VFO even better. As long as the unit is locked, long term drift is the same as the PIC crystal reference oscillator.

The simple frequency counter project from the October 2006 Homebrew would make a good basis for a huff & puff stabiliser. As there are several I/O port pins left unused on the PIC. It would be a fairly simple matter to add the extra components to make a LPF/integrator for the error correction pulses from the PIC. It should also be possible to use the 10 bit PWM output of the PIC to provide the frequency correction pulses. I might have a go at doing this for a future Homebrew project.

PHOTO 2: 200MHz reference clock consisting of a 100MHz OCXO module (left) and doubler circuit.

The other obvious choice for the local oscillator is one of the newer programmable clock generator chips like the Silicon Labs Si570. These PLL-based devices can produce a clock signal at frequencies from around 10MHz to UHF. The output frequency can be programmed by a PIC or other microcontroller via an I²C serial interface. Amateurs using these devices as receiver local oscillators have reported that they produce low phase noise and low spurious signals. This makes them a viable alternative to the DDS in this application. Hans Summers' website (mentioned earlier) has a detailed DDS vs Si570 comparison.

My junk box search produced several DDS devices: a couple of AD9851s as used in previous projects, a couple of AD9852s and a single AD9951. The AD9851 has given very good service in some of our previous projects. It is a reasonably good performer, but the level of spurious outputs is a bit too high for use in a high performance receiver. The spurs are generally at or below the noise floor on the low frequency bands. On 10m, or when I am transverting to VHF where band noise is at a low level, DDS spurs often appear above the noise.

The AD9852 is a 300MHz DDS with a 10 bit DAC. This offers similar performance to the AD9851 except that the maximum output frequency will be a bit higher and spurs may be a bit lower because of the higher maximum clock frequency.

The 400MHz AD9951 and the 1GHz AD9912 are newer devices, with 14 bit DACs. The improved design, extra four DAC bits and higher clock frequency results in a significant reduction in DDS spurs. These 14 bit DDS chips are used in several of the more recent commercially made HF transceivers.

A hybrid DDS/PLL of the type used in the June/July 2010 VHF synthesiser project would probably offer the best compromise between phase noise and spurs. Unfortunately, a band switched version covering all HF bands would be horribly complicated. It would seem that the AD9951 is the best of the available choices. The choice is made easier by the fact that I have one gathering dust in the shack.

DDS CLOCK. The long and short term phase and frequency stability of a DDS depend on the quality of the clock signal. This means that the clock oscillator is a key component in the DDS system. Because I have become accustomed to the extremely good frequency accuracy and stability of the AD9851 DDS I am using in my current transceiver, I will expect to achieve similar performance from the new unit. OCXOs are now widely available on internet auction sites like eBay. The most sought-after (and therefore most expensive) units are 10MHz OCXOs. Oscillators with odd frequencies like 101MHz are not in great demand and can be bought very cheaply. At the time of writing several 101.xxxMHz units are up for auction with a starting price of around £10 and little or no interest from bidders. 10MHz units of similar quality are 2-3 times this price and selling like hot cakes. As the DDS clock frequency can be any arbitrary value as long as it is several times the maximum output frequency, these OCXOs would make a very good DDS clock. The 245MHz Vectron units sell for around £25. These would be ideal for our application because they could be used directly

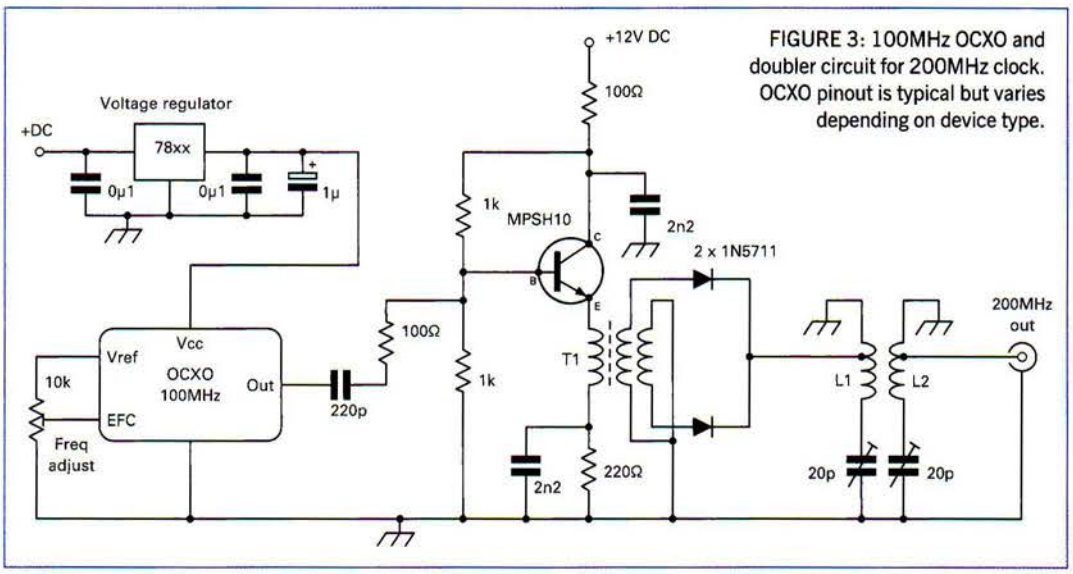

FIGURE 3: 100MHz OCXO and doubler circuit for 200MHz clock. OCXO pinout is typical but varies depending on device type.

without any need for frequency multiplication.

I have a couple of spare 100MHz OCXO that could be used for this project. The maximum output frequency of my DDS will be around 52MHz – 10.7MHz = 41.3MHz. I would like to allow for a higher output frequency in case I want to cover the 4m band at a later time. 70.7 – 10.7 = 60MHz or thereabouts. The old rule of thumb that the clock should be more than three times the maximum output frequency suggests that 180MHz is the absolute lower limit for the clock frequency. I would prefer to use an even higher clock frequency so that I can keep spur and alias signals to a minimum. The AD9951 has a built-in PLL based refclock multiplier that can be programmed to multiply the clock frequency by various values ranging from 4x to 20x. This means I could get a 400MHz clock by using the 100MHz OCXO and 4X multiplier or a 200MHz clock from a 10MHz OCXO and 20x multiplier. Using the internal multiplier comes at the cost of increased close-in phase noise on the DDS output signal. Before I try using this approach, I would prefer to have a go at building a VHF DDS refclock based on a 100MHz OCXO and a frequency doubler or tripler. Frequency multiplication in the external refclock will also cause some phase noise increase at a theoretical rate of 6dB per octave, but this will probably still be cleaner than the internal PLL based refclock multiplier.

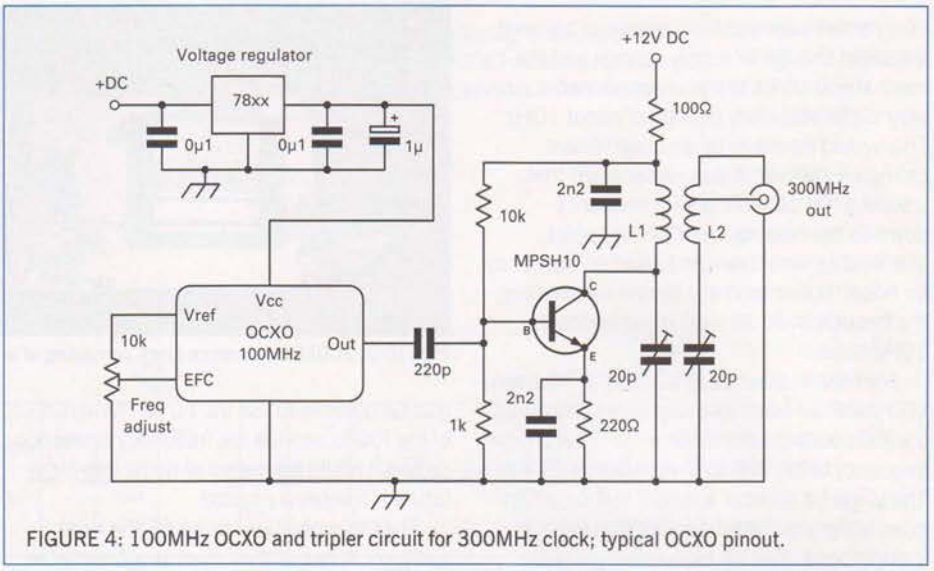

FIGURE 4: 100MHz OCXO and tripler circuit for 300MHz clock; typical OCXO pinout.

The complete OCXO and doubler circuit is shown **Figure 3**. The diagram indicates a typical pin configuration for an encapsulated OCXO; specific voltages and pin numbers are not shown because they tend to vary depending on the type of OCXO used. Most OCXOs have an EFC (electronic frequency control) input that can be used for fine tuning the output frequency or phase locking to an even more stable reference like a rubidium standard or GPSDO.

The output from the OCXO is buffered by an emitter follower. This may not be necessary if the oscillator is designed to produce 1V or more into a 50Ω load. However, it is always a good idea to at least put a coupling capacitor between the OCXO output pin and any external circuit. This will prevent DC voltage in the external circuit from damaging any transformer or low value resistor that may be in the OCXO's internal buffer amplifier.

T1 in the frequency doubler is 6 turns of enamelled copper, trifilar wound on a FT37-61 ferrite toroid. L1 and L2 are each 4 turns of 1mm copper wire (TV coax core) wound wide spaced on a 5mm former. The output tap on L2 is 1 turn from the ground end. The 20pF trimmers are Philips green types. 20pF UHF piston trimmers would be preferable if you have some available. **Photo 2** shows the assembled oscillator/doubler unit.

I am sometimes foolish enough to expect such a simple circuit to work properly at the first attempt. Initial testing was a complete failure. There was plenty of output at 400MHz and almost none at 200MHz. The 400MHz output was almost 30dB stronger on the spectrum analyser. I suppose I should have just cut my losses, declared the job finished and used the 400MHz signal as the DDS clock. It is not that easy to debug VHF/UHF circuits because my oscilloscope bandwidth is limited to 60MHz. I eventually came to the conclusion that the relatively high output from the OCXO was overdriving the MPSH10 buffer to the point where it makes a surprisingly good frequency doubler. The resulting 200MHz is doubled again by the diodes. The problem was cured by placing a 100Ω resistor in series with the buffer input, as shown in the schematic. The circuit now produces a nice 200MHz signal with the 100MHz fundamental and 300MHz harmonic very well suppressed.

Figure 4 shows a frequency tripler that produces an output at 300MHz. L1/L2 are 3 turns of 1mm wire on a 5mm former. The L2 output tap is at 0.75T above ground. Output from this circuit is slightly stronger than from the doubler circuit, at just under +3dBm. The 200MHz and 400MHz outputs are only 30-40dB below the 300MHz signal. I will add a third resonator to the output filter to see if this will improve the spectral purity of the output signal. This would then be an ideal clock oscillator for the DDS.

Next month we start work on the DDS unit.

REFERENCES

[1] A2087 (CV2171) data sheet, Marconi, 1959
[2] Elektor Electronics, February 1998, Frequency display and VFO stabiliser, E Skelton, EI9GQ
[3] http://homepage.eircom.net/~ei9gq/stab.html

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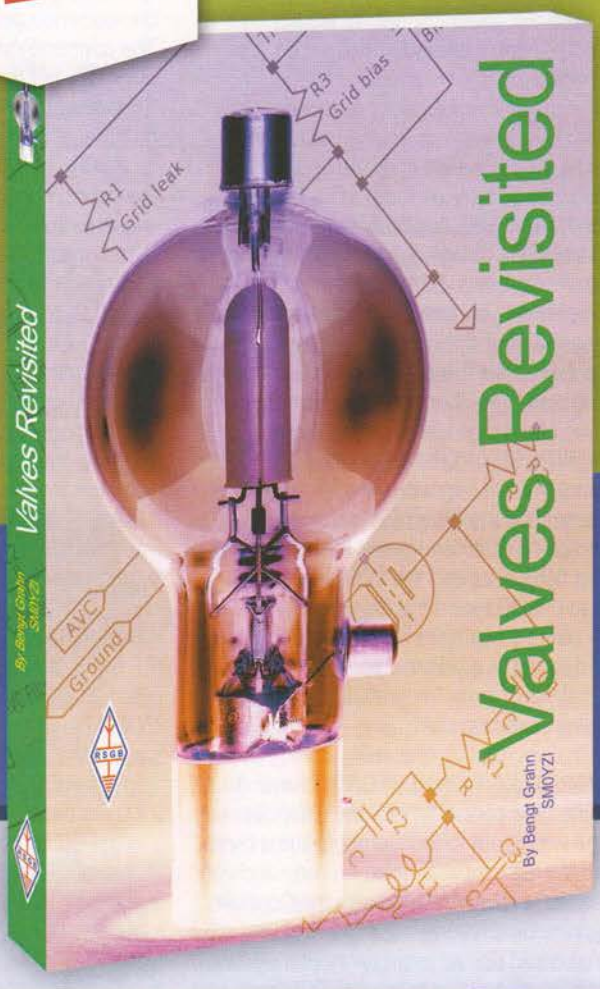

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PICaYAGI

Part 2: the electronics

INTRODUCTION. This part covers the construction of the various electronic assemblies, principally the Command Unit that goes in the shack (and is constructionally trivial) – and the Controller, which mounts on the Yagi boom. The functional relationship between them is shown in **Figure 4**. This also shows the two user interfaces. During commissioning, a PC is used to control all the Yagi parameters via an RS232 link (max 100m). The outcome of this is up to three antenna configurations (or 'solutions') stored per frequency. During normal operation the Controller measures your instantaneous Tx frequency and following any change, the Command Unit is mostly used simply to tell PICaYAGI to go to one of those stored solutions. All the detail follows later.

COMMAND UNIT. See **Figure 5** and **Photo 5**. The purpose of the Command Unit is to route DC power up the coax to the Controller. The operation of SW1, the Command Switch, may look obtuse since it evidently does the same job in both switch positions. The secret lies in the brief break in supply during the changeover period. This break is detected by the PIC in the Controller and interpreted as a user command.

This simple circuit is built into a PCB box about 8 x 4 x 4cm. The best construction method uses point to point wiring that not only saves making a PCB but also keeps the strays to a minimum. It is very important that this unit be fitted last in the coax line up to PICaYAGI, since many SWR bridges, power meters and coax switches could be damaged if you apply DC power to them via the coax inner.

To prevent you from ever fitting the unit the wrong way round, I suggest you wire the coax to the Tx/Rx as a flying lead and fit a connector for the lead to the Controller, as illustrated.

CONTROLLER OVERVIEW. Fitted on the boom, this has the two logically separate functions of 1) controlling the PICaYAGI parameters and 2) providing matching between the single-ended 50Ω coax and the 200Ω balanced feed to the FED element. So it could have been built as two units but since neither would easily fit inside the boom it was felt better to keep them integrated for weather-proofing purposes.

CONTROLLER CONNECTORS. I haven't specified the connectors for the Controller or for the wiring out to the elements since there are many different strategies. An early decision is needed because it determines the Controller enclosure dimensions.

You could use *no* main connector on the Controller, solder wire tails to the PCB pads and then fit individual wire-wire connectors further out. Although more flexible, this approach does make the Controller more difficult to remove.

If you opt to fit a multi-way connector you need at least 28 poles. This allows two poles for each heavy current line – but only one pole for all the +5V feeds to the shaft encoders and one common pole for all their ground returns. The connector should be gold-flashed to give durability out there. I used a good quality 36-way shrouded IDC plug/socket (as used on parallel port printers).

For the individual wire connectors outside the boom, I used bullet connectors. These are available from all car accessory shops and used in the hostile environment under car bonnets. I crimped them with Mole grips. My thanks to David, G3YYD for this suggestion.

Wiring to the motors and shaft encoders passes from outside to inside the boom via the smallest possible holes drilled in the underside of the boom. Since you need to be able to separate the boom modules for servicing, I confess to using the dreaded 5A terminal block ('choc block') inside the boom – because you need to remove the connectors from the wires to extract the wires through the boom wall.

CONTROLLER DESCRIPTION. See **Figure 6**. RF and DC arriving up the coax are split by C2 and L2. The RF component is transformed to 200Ω balanced by L3 and then each arm passes via a series capacitor (determined by RL4-RL7) and out to the taps on the FED element.

The DC component feeds the two regulators, IC5 and IC6 – and the presence of this DC is sensed by the PIC on the Usercmnds line.

This Usercmnds line is DC coupled all the way back to your Command Unit and a brief break in the DC supply is used by the PIC to sense Command Switch operation. During these switch transients, power is maintained by the energy in C32, while D2 prevents reverse current flow.

Both the battery pack and IC6 supply power to the screwdriver motors for the elements.

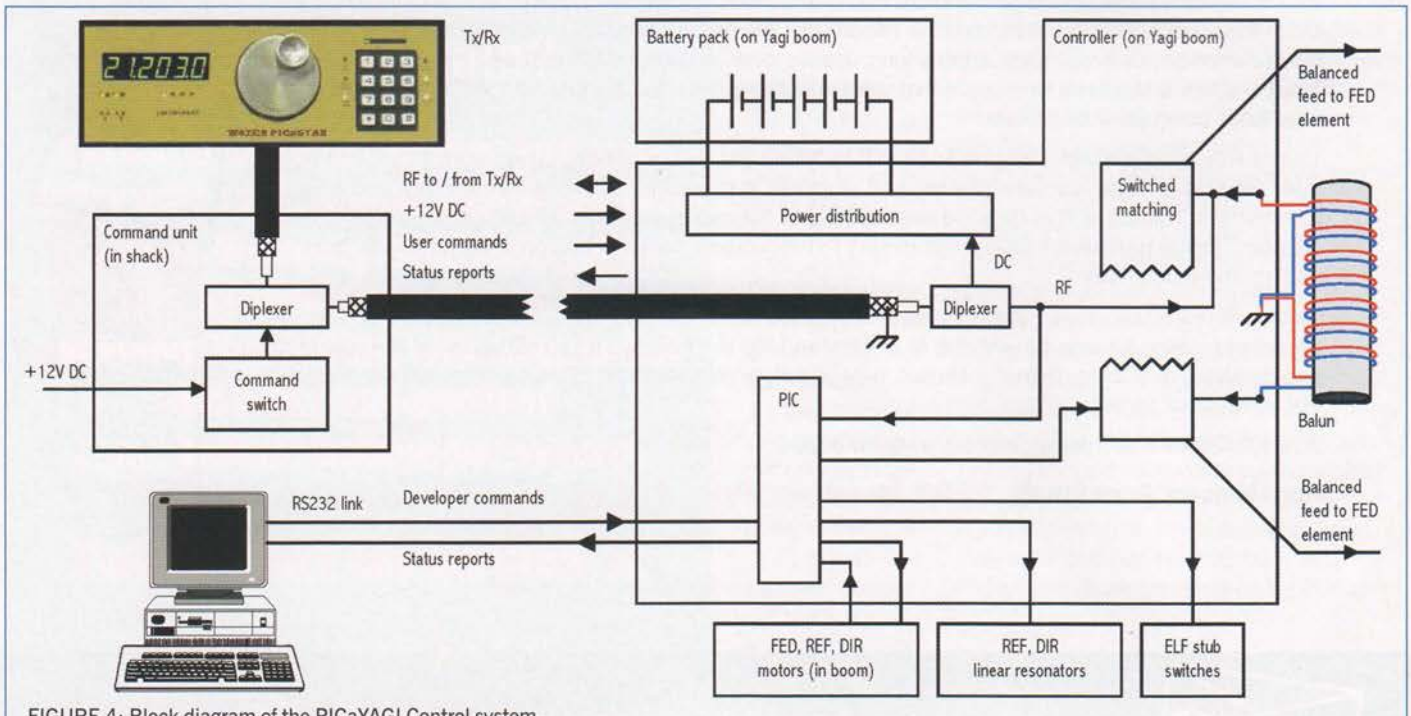


FIGURE 4: Block diagram of the PICaYAGI Control system.

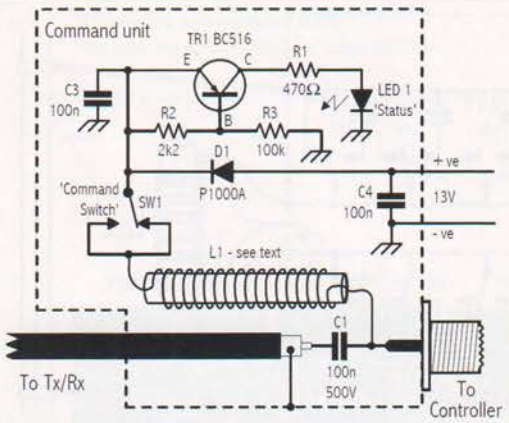


FIGURE 5: Command Unit circuit diagram.

PHOTO 5: Command Unit construction.

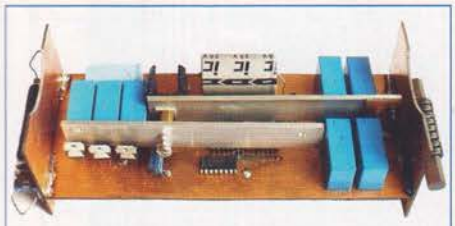


PHOTO 6: Controller from beneath before fitting the side and top plates. Note the end plate cut-out arcs.

PHOTO 7: Controller in PCB box with GRP shrouding mounted on the boom.

Most of the time, IC6 takes the load but if there is a lot of element movement in a short time, IC6 gets hotter, starts to shut down and the battery takes over. VR1 sets the point where this transition occurs. Charging is via D8/R4. My thanks to Chris Stake for suggesting this approach and for the detailed implementation. It avoids the need for either a much larger capacity (and heavier) battery - or a much larger (and more expensive) regulator.

A sniff of RF is tapped off by R10 and C33, clamped by R17/18 and D9/10 and fed to the PIC to allow it to determine when the Tx is on. This line also goes to the PIC real time clock register via an internal 50MHz prescaler for frequency counting purposes. The values of R10 and C33 are somewhat critical in discriminating between no transmission and extreme QRP operation across the 20m-10m spectrum while at the same time not saturating at higher power levels. CW status messages are fed back from the PIC to your Rx via this same line.

Relays RL1/2/3 define the direction of element movement – IN or OUT – for the FED, REF and DIR elements respectively. These are pre-set before applying power to the screwdriver motor via TR2/3/4. The hardware is configured so that, in principle, more than one element could be moved simultaneously. The extra complication in the software and the power budget issues are such that, at the time of writing, only one element is moved at a time.

The remainder of the PIC is devoted to relay switching, via IC2/IC4 and IC3. There are enough spare lines that IC2 could be dispensed with, but I chose to retain the spare capacity.

My thanks to Bob, 5B4AGN for suggesting the use of the hi-side drivers from the UDN family of ICs. These lead to simpler tracking than the more familiar (to me) lo-side drivers of the ULN family.

CONTROLLER CONSTRUCTION NOTES. This PCB is best manufactured by the iron-on toner transfer method. Many of us use this method nowadays and if you are not familiar with it, it is fully described in [1]. It gives no better results than photo-etch but requires less investment. If you normally wait for someone else to make PCBs for you I recommend you give it a go since the ability to make your own PCBs is the essential prerequisite of designing anything non-trivial yourself. This PCB is particularly easy because it is single-sided, with continuous unetched ground-plane on the non-track side.

I also commend to you a W4ZCB Beeper for checking out track shorts/opens and soldering integrity. Its great virtue is that, unlike some DMMs, it does not apply out of spec voltages to active devices. See [1] for details. You can build it dead-bug style in 30 minutes.

The Controller PCB is mounted – somewhat unconventionally – track side up. Components are mounted on both sides, as specified in **Figure 7**.

- All the large electrolytic capacitors are illustrated at approximate size and position.
- L2 leads are shown 'long' only for illustration purposes.
- Note that the balun must be fitted *outside* the box to avoid the box acting as a shorted turn on the coil.
- IC6 is mounted vertically. The extensive heat sink on IC6 is only partially illustrated. **Photo 6** shows the full detail of a finned heat sink and much aluminium bar bolted to IC6 and supported by PCB brackets.
- The main RF + DC coax is routed through the board to SK1 on the underside - mounted on a PCB bracket soldered to the side wall. This gives maximum shrouding to this critical connector. You need to cut a slot in the end plate to allow passage of the coax.
- TR2, 3, 4 are mounted vertically as shown in Photo 6. They don't need heatsinks.
- Programming socket SK4 is not essential; after the PIC is programmed for the first time off-board it can be re-programmed on the mast via the RS232 link.
- PL3/SK3 are fitted to allow local testing of the Controller in the shack without using the main connector.

Photo 7 shows the completed assembly as fitted to the boom. It would be impractical to fully seal a box that has so many penetrations, so I chose the approach of sealing against rainfall from above but leaving it fully ventilated from below. To this end, the assembly is slightly wider than the boom diameter – and you can see a small ventilation gap adjacent to the boom on the lower long edge.

End plates. Determine the height of the end plates to give generous enclosure of all the PCB components. Then add a further 3cm. This allows you to cut out a partial circle (arc) so that the end plates sit astride your boom. If you are fitting a multi-way connector you may want to angle that end plate so that the leads from the connector go down towards the boom; in that case, that end plate will need to be correspondingly taller. And, at least in theory, the cut-out for the boom then needs to be parabolic (but not in practice!).

The Controller is mounted on the boom by fabricating GRP mouldings bonded onto each end plate, which are then secured to the boom by hose clips (that also retain the Controller's grounding strap). This allows the Controller to be moved along the boom to establish the best geometry for matching. The technique for making GRP mouldings is described shortly.

Side plates. The height of the side plates is the same as that of the end plates. Their length is determined by the need to shroud any connector(s).

Each side plate has a small rectangular PCB 'washer' bonded to it to act as a feed-through insulator. 2mm wire takes RF from inside to outside the enclosure. Before fitting the side plate, drill the hole in the washer and side plate and countersink all but the outside face of the washer. Solder in the side plates, bond the washers to the side plates with epoxy resin and solder in the 2mm wire before the epoxy resin cures.

Top plate. This is not soldered to the others. It is extended with a thin layer of GRP to form lips on all four sides – and down and along to shroud any connector and the first few cm of wiring.

BATTERY PACK. This comprises five 2Ah cells soldered in line in series and fits neatly into some PVC waste pipe, which must be

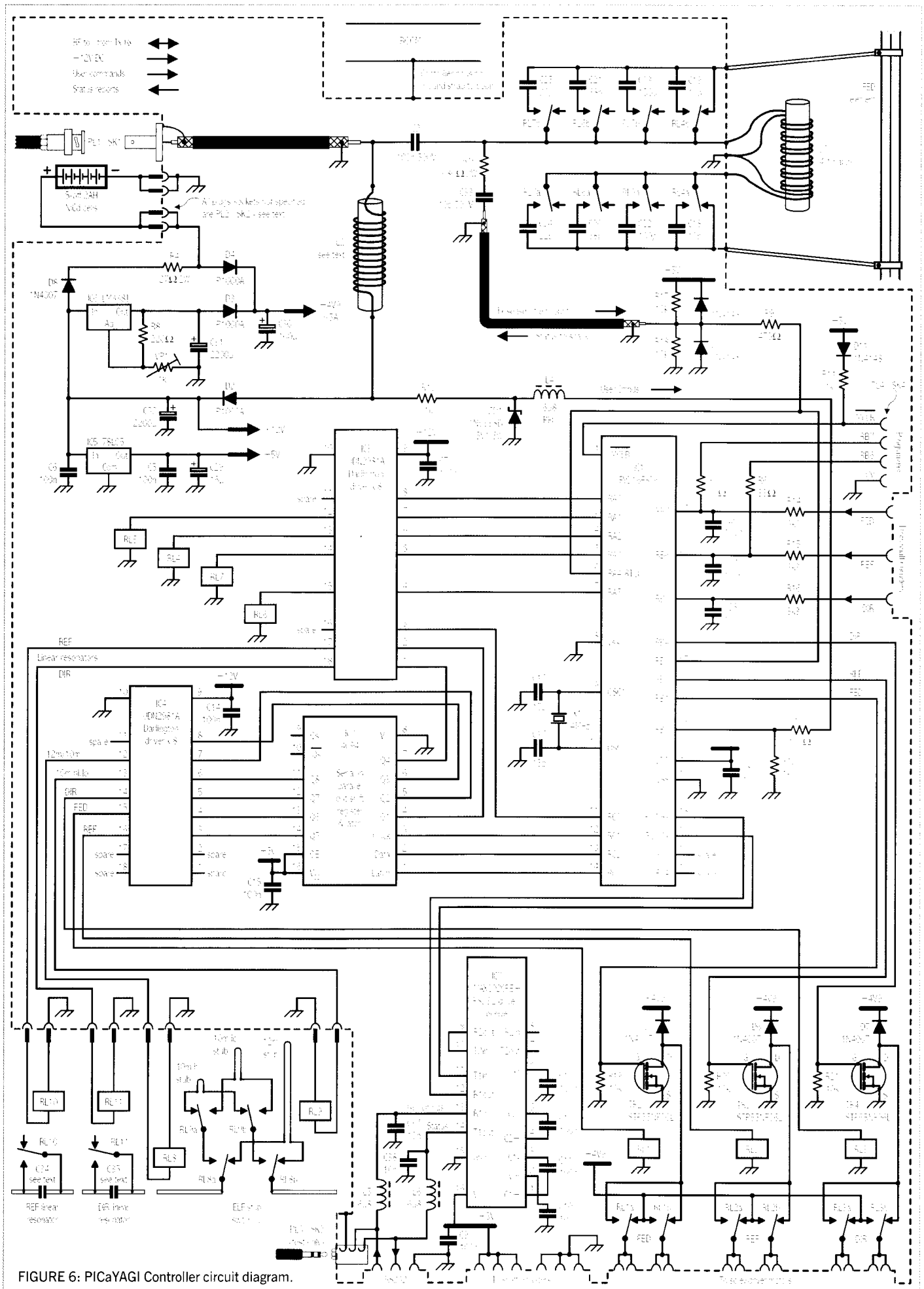
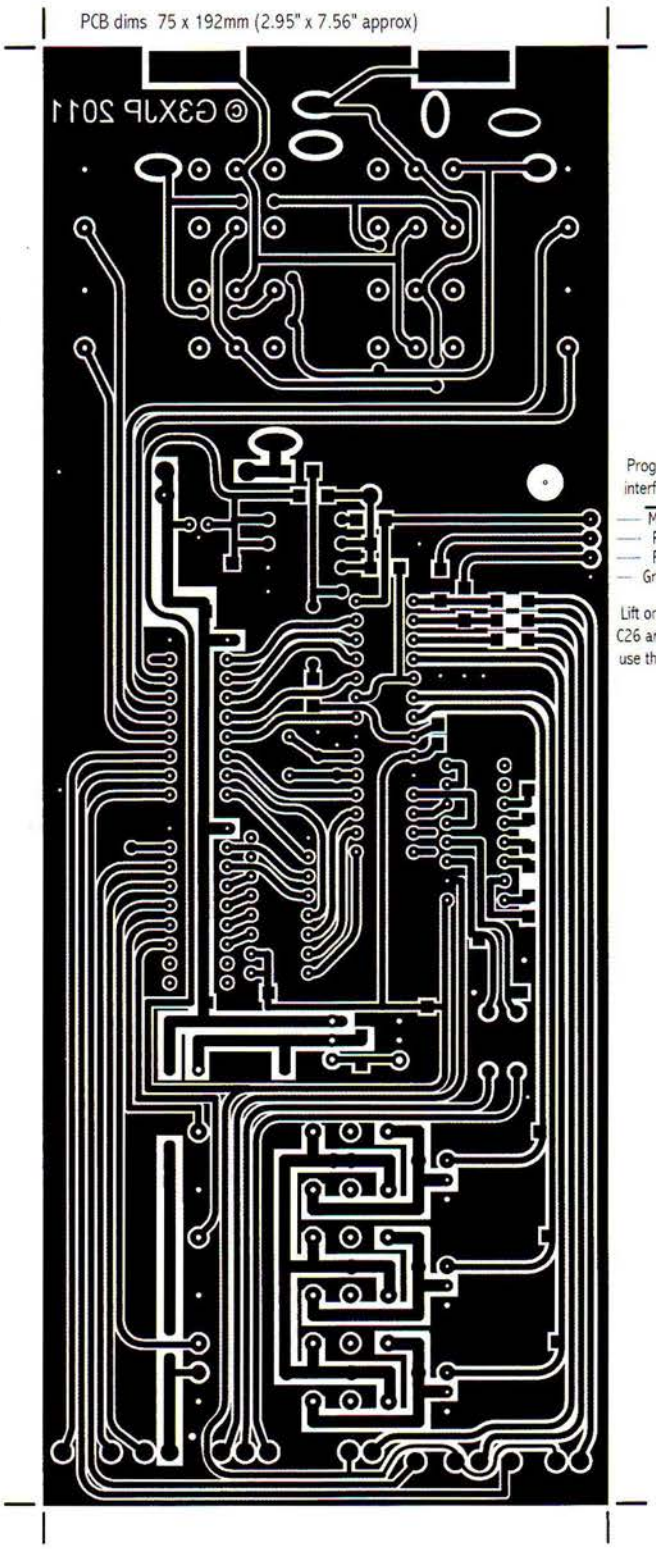


FIGURE 6: PICaYAGI Controller circuit diagram.

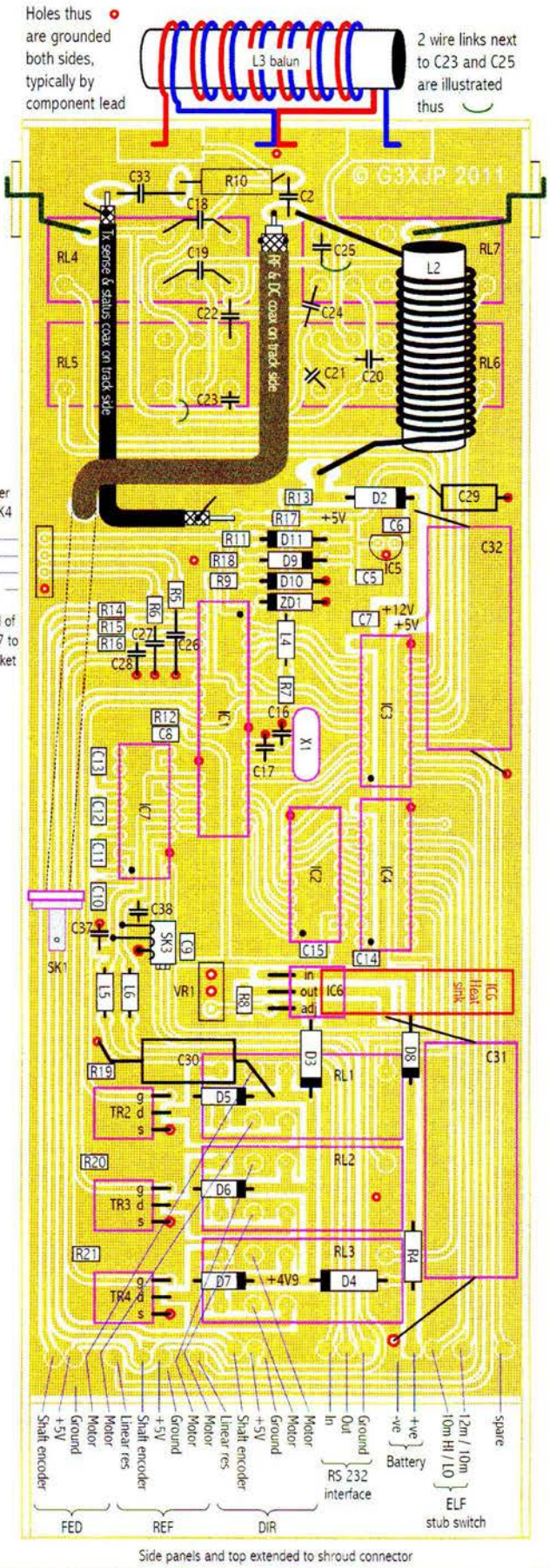
PCB track and drilling template at size.
Most holes are drilled 0.7mm. For relays drill 1mm.

NB:-This image is mirrored - assuming toner transfer method of manufacture.



Top view of PCB (track side) showing component location.
Underside is unetched ground plane.

All ICs, relays, X1, SK1, C31, C32 and Tr2, 3, 4 are on underside.
All other components are track side.



Side panels and top extended to shroud connector

FIGURE 7: Controller PCB and component overlay.

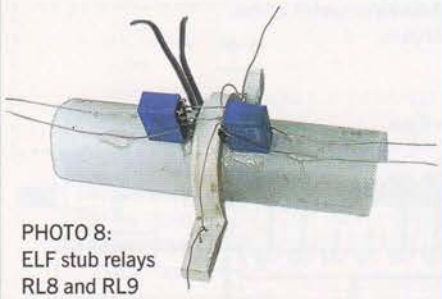


PHOTO 8: ELF stub relays RL8 and RL9 before encapsulation in GRP.

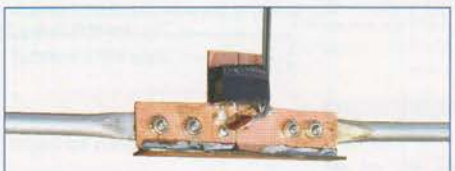


PHOTO 9: REF or DIR linear resonator relay mounting. RL10 is on the REF assembly, RL11 on the DIR assembly.

ventilated. It is taped under the boom; its position is used for fine tuning the boom's mechanical balance.

I used NiCd cells rescued from an old cordless drill pack. I think NiMH would be fine since the charge rate is very low, but I haven't tried them.

GRP MOULDING PROCESS. For basic materials, I bought some general purpose resin, catalyst and fine glassfibre cloth via the web [2], though you could use a car body repair kit for these. At the same time I bought two 1000mm lengths of 25.4 OD x 19.4mm ID GRP tube. This tube is used later for element fabrication purposes.

Several components are fabricated by GRP moulded to fit onto a particular shape, eg the boom, but without bonding to it. To achieve this, you must first cover that shape with something that the resin will not adhere to. Furniture polish or polyethylene sheet are popular resists but I find kitchen foil – shiny side out – gives the cleanest result. I used this approach for mounting the ELF relays and the Controller to the boom and for extending the Controller top cover.

Form the kitchen foil to fit the shape (eg the boom), allowing plenty of excess at the edges. Fold, crinkle and pinch the edges to secure it or to add some rigidity. First paint on a layer of resin. Then add layers of fibreglass mat, saturating each layer with resin by stippling with a paint brush. Avoid brush strokes, which could move the glass strands. A large number of small pieces of mat is easier than the other way round.

Once you have enough mat thickness to retain its shape, let it cure, remove it and trim it with a pair of scissors. Then replace it and add further mat and resin to give the required strength, using the existing cut edges as a guide.

There is always some resin left over, so I made a habit of painting yet another coat on the balun before cleaning up. Do not be tempted to apply resin to the PCB, as this makes any rework extremely difficult. I prefer several coats of clear acrylic auto varnish, which can be removed with a solvent – or even soldered through in emergencies.

ELF STUB RELAYS. As shown in **Photo 8**, I first laminated some GRP around just over half the circumference of the boom. I then bonded on the two relays, RL8 and RL9. You can see I also added some UPVC bar to support the ELF element. This was in the early days when I planned to use a wire ELF. You don't need that UPVC support bar.

Note that the 10m HI stub shown in Figure 6 is a direct link between the RL9 terminals, ie the minimum possible length. Solder in that link. Bring out wire tails for the relay coils, the 10m LO and 12m stubs and the two half elements. Then completely encapsulated the assembly in GRP. This then clips on the underside of the boom, adjacent to the ELF element clamp.

LINEAR RESONATORS. One of these is fitted each to the REF and the DIR. See **Figure 8**. A normally open (NO) relay contact shorts the capacitor in the middle of the resonator to switch it off. The two resonators are constructionally identical.

As shown in **Photo 9**, the relay is bonded to a small piece of PCB, to which the tubing is bolted with 4mm stainless hardware. A further strip of PCB at right angles adds vertical strength. The PCB copper plane is simply scored up the middle to electrically separate the two halves.

A clamp is made from approx 330mm of 20 x 3mm flat bar by bending it round an element pair. Mole grips are used to force it closed around the element while drilling the screw holes and fitting the screws. You need 6 of these clamps in total - 4 for the linear resonators and 2 for the matching system (described later).

The 9.525mm OD tube is bent to shape, flattened at both ends with a hammer, then filed even flatter and finally trimmed to length.

For commissioning, use a trimmer of about 50pF for C34 and C35. I used mica compression types. These were subsequently replaced – after tuning – with 350V rating silver mica capacitors. Finally, the whole PCB assembly was encapsulated in GRP.

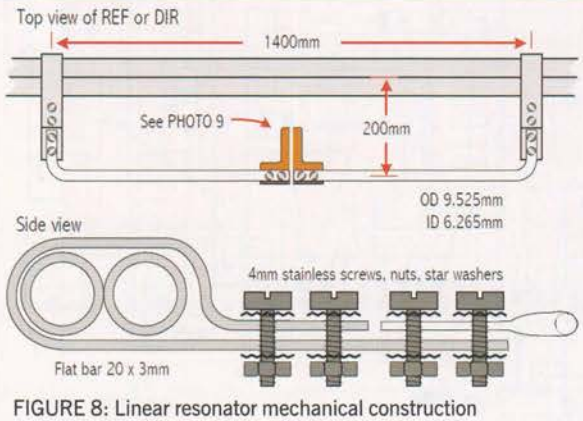


FIGURE 8: Linear resonator mechanical construction (not to scale).

COMPONENT LIST

Capacitors (wire ended unless stated)

C1, C2	100n, 500V
C3, C4, C26-C28	100n disc ceramic
C5-C15	100n (1208
SMD)C16, C17	15p ceramic
C18, C19	10p 350V silver mica
C20, C21	68p 350V silver mica
C22, C23	150p 350V silver mica
C24, C25	22p 350V silver mica
C37, C38	10n disc ceramic
C29	15µ 10V electrolytic
C30	100µ 10V electrolytic
C31, C32	2200µ 15V electrolytic
C33	10p 500V
C34, C35 (linear resonators)	see text
C36 (x3 for shaft encoders)	100n disc ceramic

Inductors

L1, L2, L3 are all wound on 5 x 50mm ferrite rod

L1, L2 chokes	19t of 2mm EnCu wire
L3, 4:1 balun	8 bifilar turns of 2mm EnCu wire
L4-L6	6µ8 axial choke

Resistors - wire ended

R1	470Ω	R4	270 2W
R2	2k2	R10	680Ω 2W
R3	100k		
R22,R23 (x3 each for shaft encoders)	2k		

Resistors - 1208 SMD

R5, R6	33Ω	R11-R13	1k
R7	150Ω	R14-R16	3k3
R8	220Ω	R17-R21	10k
R9	470Ω		

Semiconductors

D1-D4	10A, P100A
D5-D8	1N4007
D9-D11	1N4148
IC1	PIC 16F876
IC2	4094
IC3, IC4	UDN2981A
IC5	78L05
IC6	LM338T
IC7	MAX202CPE+
IC8 (x3 for shaft encoders)	KTIR0221DS
TR1	BC516
TR2-TR4	STP55NF06L N-channel power MOSFET

Relays

RL1-RL9	2p C/O, 240V mains rated, 12V coil
RL10, RL11	1p NO, 240V mains rated, 12V coil

Miscellaneous

SW1	1p momentary break, 5A
LED 1	not critical
VR1	1k, 10 turn preset
X1	4MHz wire-ended xtal
ZD1	1N5338B 5V1 5W Zener
5 x 2Ah NiCd cells with tags, soldered in series	
PL1 / SK1	50Ω BNC
PL2 / SK2 and PL4 / SK4	unspecified, see text
PL3 / SK3	stereo plug/socket for local testing
Motor M1	Homebase CSD3623
(3 off screwdrivers)	

WEBSEARCH

[1] http://uk.groups.yahoo.com/group/picaproject/files/4.%20Pic-a-STAR/STAR%20documentation/
[2] www.ecfibreglasssupplies.co.uk/

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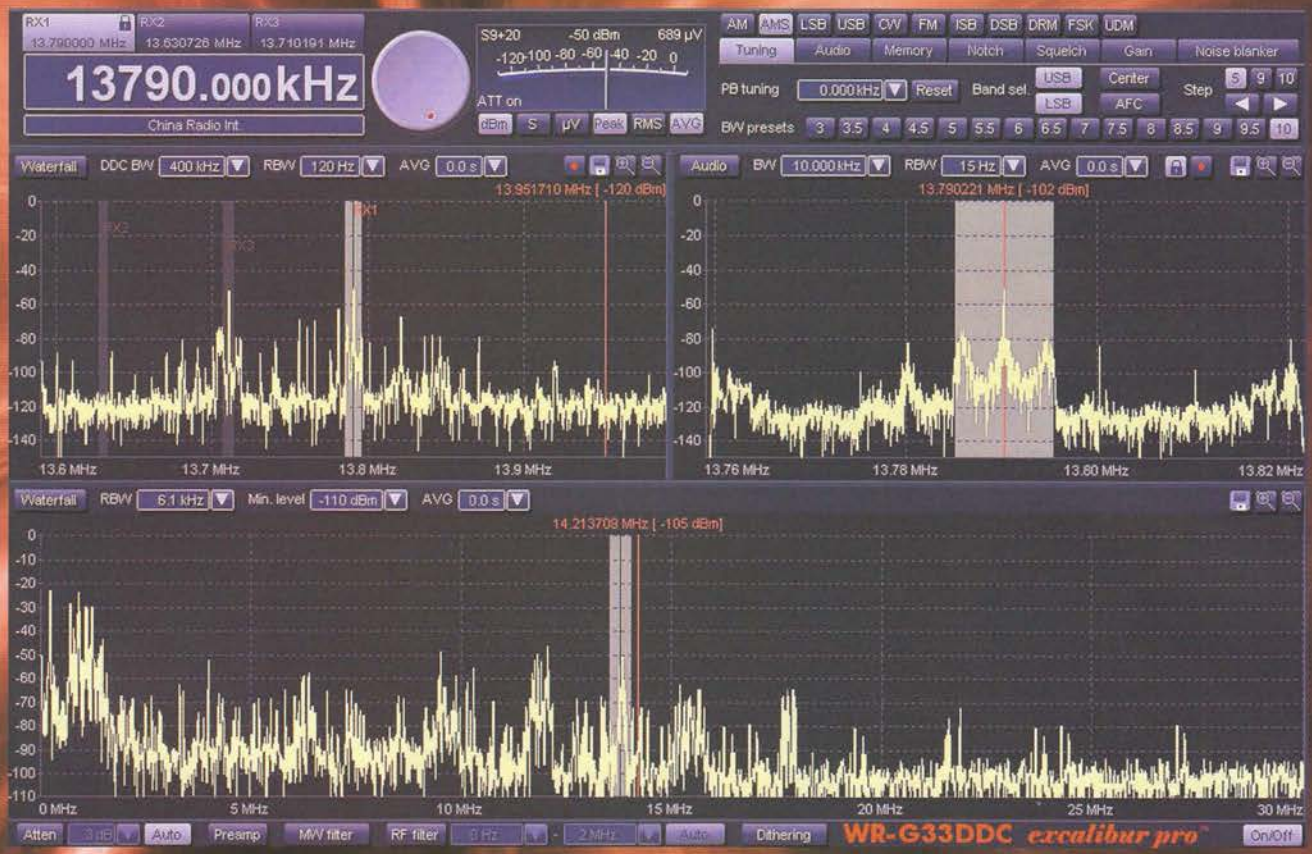

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Kanga Finningley 80m SDR

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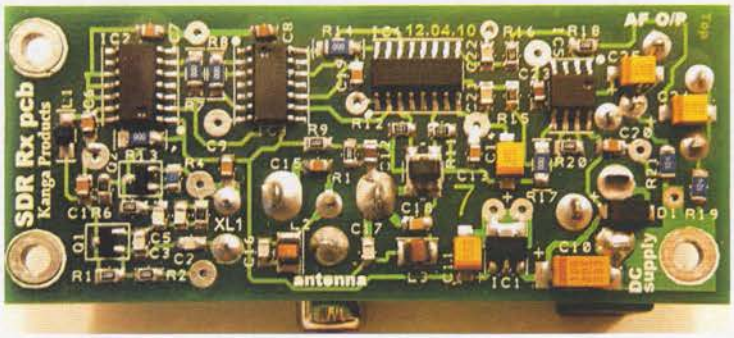

PHOTO 1: Completed Kanga Finningley 80m SDR receiver.

GETTING STARTED IN SDR. This article is addressed to amateurs who may be interested in SDR but have not yet had the opportunity to test its advantages. Many have felt the excitement surrounding software defined radio (SDR) from the articles in *RadCom*. Some may have had the pleasure of controlling SDR receivers on the internet [1]. I have found it intriguing to learn about associated refinements, especially the waterfall display.

Perhaps, like me, other amateurs have felt the desire for practical experience in SDR as an aid to its understanding. Although experienced in practical work, I also thirsted for hands-on experience in soldering surface mounted devices (SMD). At the North Wales (Llandudno) rally in November 2010, there came a chance to kill two birds with one stone. The Finningley 80m SDR Dongle kit (**Photo 1**) employs SMD exclusively. It was offered by Kanga Products at a very reasonable price.

SELF PREPARATION. While waiting for the kit to arrive, I downloaded the manual [2]. It informs us that the dongle was originally conceived as an introduction to SMD construction for the SMD Workshop held at the 2010 Finningley Microwave Round Table. Later, the Finningley Amateur Radio Society kindly gave Kanga Products permission to market the kit. I also downloaded the *WinRad* manual [3] by Alberto, I2PHD. This is essential reading. *WinRad* is compatible software that I found works well with the SDR dongle. It runs under *Windows XP* and *Windows 2000*. More recently, *WinRad HDSDR* has been issued [4]. I highly recommend this version, which closely resembles *WinRad*, but has new and extended features.

If, like mine, your computer sound card has a 96kHz sampling rate, the 80m coverage will be 3.703 to 3.790MHz. If the sampling rate is less, a reduced portion of the band will be available. *WinRad* software accepts a bandwidth of up to 192kHz from a complex mixer generating I and Q signals, for processing and display. This and other topics in Alberto's manual may be novel to those only having experience of conventional receivers. I found the concepts began to grow on me with increasing clarity, so please don't worry if everything seems new and complex at first. The manuals can be used to inform any decision to purchase the kit. For the inexperienced in soldering and unsoldering SMDs, most valuable information and tips will be found in earlier *RadCom* articles [5], [6].

THE SMD KIT. The kit includes a double sided PCB, the rear forming an earth plane. The front has plated through holes and pads for mounting the SMD components. It is screen-printed with component identities and other information. All electronic components are in SMD form. All the board-mounted input and output connectors are included in the kit.

The components come in small, clearly labelled, re-sealable polythene bags (see **Photo 2**). Many of the components are identically-sized and are not readily identifiable on their own, so they must not be removed from the bags until required for soldering. The semiconductors, including ICs, are held safely in sealed, anti-static pockets in a separate pack. The components list in Photo 2 shows the component value, its package or type designation, the quantity included and the identification on the circuit diagram, eg R1, C5 etc. During construction, I carefully crossed off the components in the list, one by one, in assembly order.

SEQUENTIAL ASSEMBLY. I felt a great deal of hidden thought has gone into this kit. Whilst it is not quite like working from those wonderful old Heathkit assembly manuals, a firm guiding hand is clearly present. The component lists are ordered in the sequence of soldering onto the board. Exactly the correct number of components was included. A series of coloured diagrams in the manual show the order that components must be soldered. **Figure 1** shows the last two of these diagrams, in which the board is completed by adding the inductors and finally the semiconductors. The sequence has been thought out carefully so that components already soldered do not interfere with those to be added later.

SOLDERING SMD. Others have detailed best practice in SMD soldering [5] so I will only refer to points I found important. It is best not to attempt to do too much in any one soldering session, to avoid fatigue and keep the quality high. A great deal of sustained concentration is required.

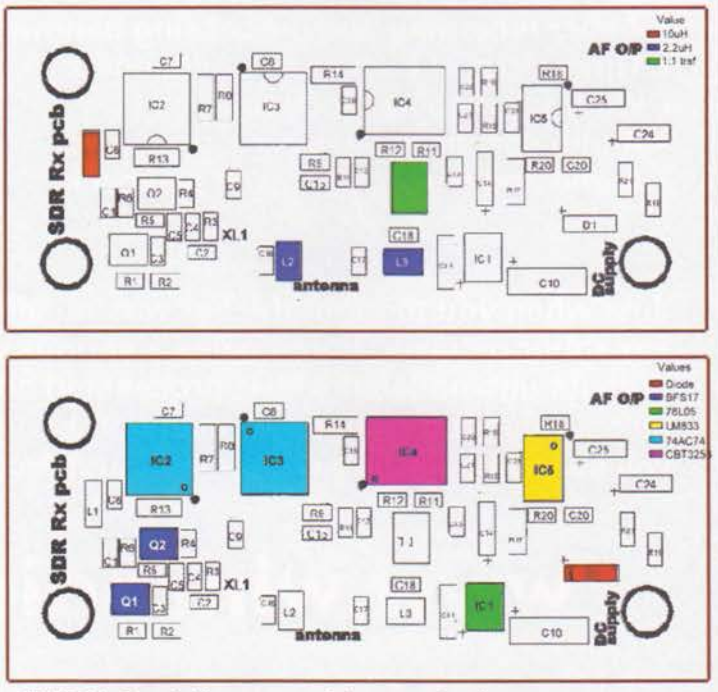

FIGURE 1: Sample Kanga sequential construction diagrams.

Don't underestimate the lighting and magnification required. The ideal is probably a large, articulated magnifier with a built-in fluorescent ring light. I improvised using a hand-held lens and a small magnifier on a hands-free stand. Normal room lighting was supplemented by an adjustable lamp and a hand-held LED torch. Magnification is vital, but every time the magnification is doubled the surface brightness is quartered. You can't have too much light.

HOLD-DOWN DEVICE FOR SMDs. This is indispensable to prevent component movement during soldering. I used an old surface plate marking gauge, **Photo 3**, acquired for 50p from a car boot sale. The arm was drilled to grip tightly a wooden cocktail stick. I prefer this to a steel point because it holds surface mounted components down firmly without risking damage. It also leaves plenty of room to work around it with the soldering iron tip. The angle of the arm is adjusted so the base of the stand is slightly tilted; its weight helps hold the component in place. When soldering, I found it easy to make mistakes. Shorting contacts with solder, tomb-stoning (soldering a component up-ended) and accidental diagonal orientation are all too easy.

SOLDER AND FLUX REMOVAL. It is important to ensure that adequate solder is deposited and that the contacts are well wetted by it. It is easy to deposit too much. The larger sizes of solder removal braid are too clumsy and can become stuck down onto the board. One controlled way of removing small excesses of solder is to use ordinary, thin stranded instrument wire. Strip it, twist the end to prevent the strands from spreading, then dip it into flux. On heating in contact with excess solder, the strands will wick it up. Just as when using solder braid, the solder-saturated end is cut off and discarded. It may be necessary to repeat the operation a few times to remove all the excess. This tip is very useful for tidying solder joints, but cannot remove all the solder, so is not a technique for separating a joint. Removal of soldered SMD components, including multi-pin packages, has been described admirably elsewhere [6].

When using a separate flux with cored solder, a residue is left on the board. I used 'HG sticker remover solvent' and a brush to clean it off. An excess of flux is best avoided because this can leave deposits under SMD devices. These are virtually impossible to wash out completely (see later).

CHECKING AND TESTING. My completed board is shown in Photo 1, with the circuit diagram in **Figure 2**. I checked every connection in a bright light with a powerful magnifying glass, hand-tilting the board to every angle

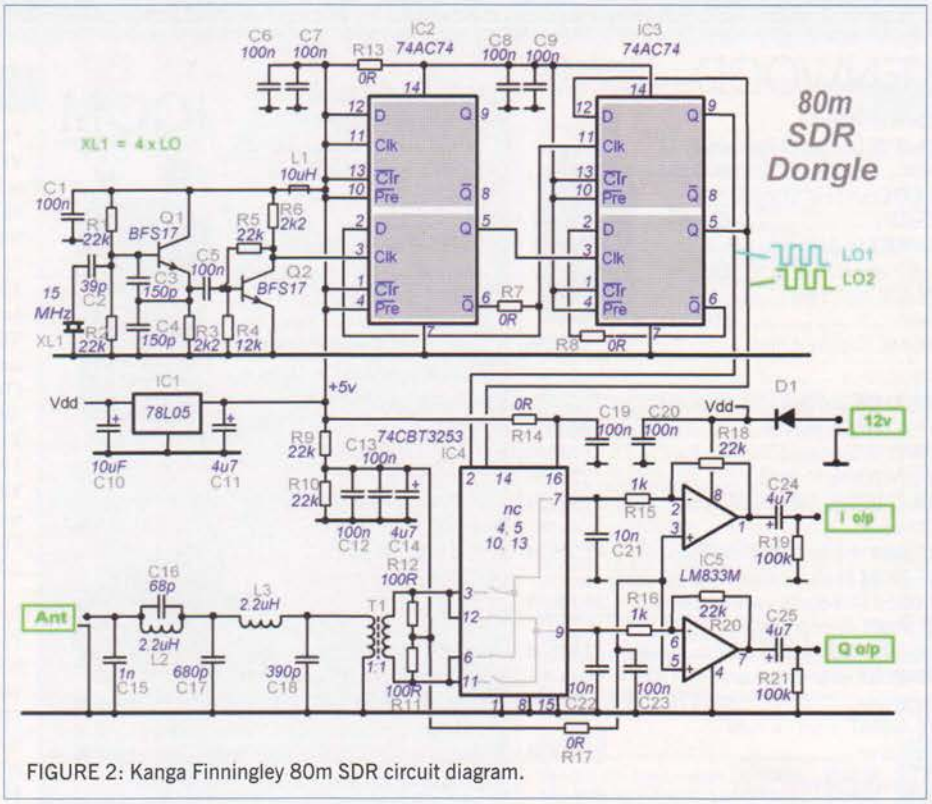

FIGURE 2: Kanga Finningley 80m SDR circuit diagram.

PHOTO 2: Component bags and list.

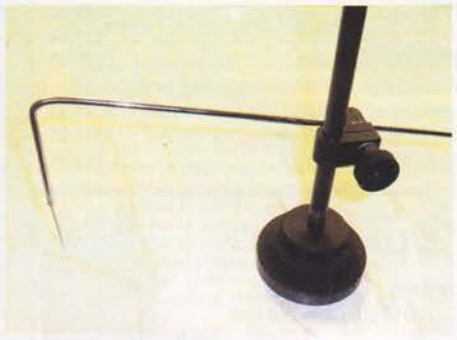

PHOTO 3: SMD hold-down tool.

to observe reflections from the solder. I was looking for sound joints and any defects. A useful online reference [7] presents photographs of good and bad SMD joints, together with further, concise SMD soldering advice. When satisfied that the soldering was sound, temporary connections were made to the board for testing. The correct standing current (about 20mA) was drawn and satisfactory operation was obtained, suggesting that all had been assembled correctly. Eventually, I did experience a problem with loss of signals. The manual gives a helpful contact point at Finningley Amateur Radio Society and I am delighted to acknowledge very generous and courteous assistance received in fixing this problem. The board is now working, giving fully in-specification performance.

During trouble-shooting, faults had been discovered. A multiplexer chip input had been damaged. Possibly this was due to inadequate anti-static precautions or an excessive RF input during testing. This is most likely down to me, since no previous problems with the chip had been experienced. These points are passed on as a warning to others rather than being a criticism of the kit. A further unexpected problem was flux deposits beneath components. It was found they were causing an increase in the noise floor of the receiver – hence my earlier remark about avoiding excessive use of flux. The receiver measures and displays its own noise floor and passband, hinting at sensitive inherent measurement capabilities (see later).

THE CASE. The circuit board works perfectly well without a case, but it is a good precaution to protect the receiver from mechanical damage and electrical interference by providing an earthed, screened enclosure. I used a 90 x 30 x 36mm Eddystone die-cast box that closely fitted the board. **Photo 4** shows the mounting hardware I used to secure the board to the lid using countersunk screws, nylon spacers, wavy spring washers and nuts. In order for the board to fit I had to drill out the box's internal pillars (see top left of Photo 4) and use longer self-tapping screws to secure the lid.

I use a 60m circumference horizontal loop antenna with balanced 600Ω ladder feeder.

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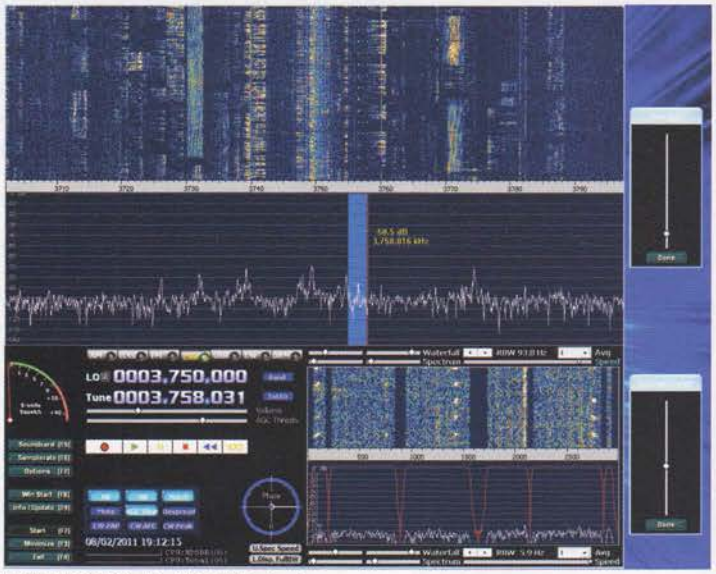

FIGURE 3: *WinRad HDSDR* display.

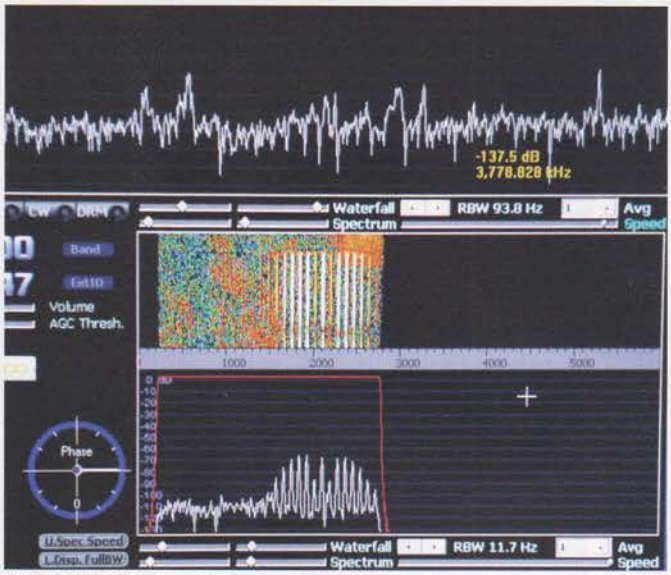

FIGURE 4: Signal analysis example.

Matching to the receiver's 50Ω coaxial input is achieved with a small toroidal transformer. I have also achieved good results with only a long wire connected to the centre of the (phono) antenna socket.

RECEIVER SOFTWARE FACILITIES. The manuals [2], [3] for the hardware and software give comprehensive information on the receiver facilities. The following describes some of the more important controls and is illustrated with real-life screen captures, using *WinRad HDSDR*.

Figure 3 was taken with the 80m band fairly busy. Mostly lower sideband (LSB) signals are seen. The upper waterfall display is a continuously-updated plot of frequency (x-axis) against increasing time (y-axis), with signal strength shown by colours against the dark blue background. I regret that no image can do full justice to the very lively moving display. Most users prefer the waterfall display to flow upwards, but the dark green options button (F7) provides a pop-up menu allowing this to be reversed (see later). A full-width conventional spectrum display is shown half way up the screen. It includes a light blue vertical bar representing the received, audible bandwidth. This can be dragged to any position, or quickly shot across to a point clicked on by the cursor, allowing ultra-rapid jump-tuning between signals.

For careful fine tuning when clarifying SSB, the mouse wheel is most useful. It can alternatively be spun to provide flywheel tuning. The options menu allows its sensitivity to be set in any of 16 steps from 1Hz to 1MHz, or it can be switched off completely. I find that 10Hz steps give excellent fine frequency control.

You may consider that the waterfall display completely supersedes conventional spectrum analysis plots; notice how the weakest signals are completely lost in the noise spikes of the spectrum display, but leave clearly visible traces in the waterfall. In case you are wondering, yes, the weakest traces can all be resolved as intelligible speech.

Both the spectrum and waterfall displays can be time-averaged or integrated over long or short intervals using the two 'Avg' drop-down menu buttons seen in the lower right of the screen. I found that such averaging did not greatly improve the usefulness of the spectrum analysis, however, it may have important technical applications. The second waterfall display in the low right of the screen, is a magnified view of fine detail in the reception passband. In the example shown, it has been set wide at about 2.54kHz and fills its window. The outer edges of the red graph below the waterfall display can each be dragged separately to adjust the bandwidth, so unlike a receiver with a small switched range of crystal IF filters, the IF is continuously variable. This facility is particularly valuable when avoiding close-in, powerful interfering signals, and when needing to exclude interfering noise just within the edges of the passband.

NOTCH FILTERING. An extremely valuable and very easily used feature of *WinRad HDSDR* is notch filtering. Up to 9 notches can be set, simply by clicking in the lower right spectrum display. In this location, rotating the mouse wheel varies the width of the notch. It will be seen in Figure 3 that 5 notch filters have been set. They produce corresponding black traces in the waterfall display of the received bandwidth. As illustrated, the notches are close to some one-second 'beep' signals appearing on 80m in the evenings. This particular transmission may sound like a single 'beep' but is clearly seen to contain a number of spot frequencies (I have seen 7 or more spots later in the evening). Had I placed the notches exactly on top of the bleep spots and the white carrier band, they would have been made completely inaudible, whilst leaving any overlaid SSB signal totally intelligible. The notch filtering is superb and very easily set, varied and removed.

NOISE FILTERING. The program offers two types of noise filtering, shown as rectangular slider controls at the extreme right in Figure 3. The lower control, accessed by right-clicking on the light blue 'NR' (noise reduction) button, enables signals to be pulled out of a very noisy background. The upper slider control adjusts the noise blanker that is accessed by right-clicking the light blue 'NB' button. This filter is only for impulsive noises and must be used with caution, as it can sometimes detract from wanted signal reception. With all these noise reduction, bandwidth adjustment and variable-selectivity notch filtering facilities, this receiver is admirably well equipped to do combat with today's increasingly noisy conditions.

An S-meter is displayed at the lower left. This mimics the conventional moving-coil analogue meter. It is shown on zero, because the program has been stopped (using the green stop/start button F8). I greatly appreciate this stop/start button. It allows graphical signal information to be recorded and held on the screen. Screen capture can then be used to obtain a permanent record with all the data and graphs visible. This enables amateurs to swap image files demonstrating the quality of their transmissions in a very informative way. Complementing this feature, recording is possible. From the green 'options' button (F7) pop-up menu, the RF input, the IF and the demodulated audio can each be recorded as files in computer memory.

RECEPTION MODES. The modes demodulated are USB, LSB, CW, AM, FM, DRM and ECSS, the last two being 'Digital Radio Mondiale' and 'Exalted Carrier Selectable Sideband'. The CW mode comes with built-in special facilities CW ZAP (automatic pitch

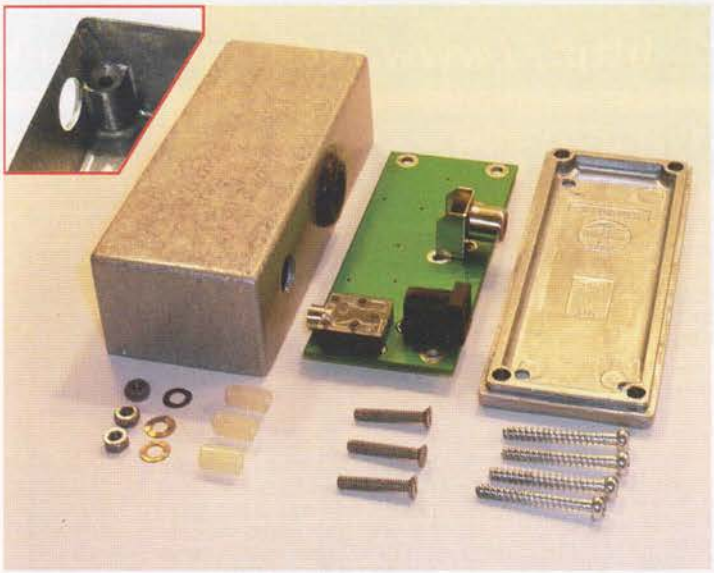

PHOTO 4: Case, circuit board and mountings (plus, inset) modifications to the box lid mounting pillars to clear the PCB.

filter correction), CW AFC (automatic frequency control) and CW Peak (an adjustable peak filter). To manage varying signal strengths, the automatic gain control (AGC) can be set for fast, medium and slow characteristics. The AGC threshold can also be varied.

UNUSUAL SIGNALS. In use, the waterfall display graphically reveals many interesting types of signal. Some types of defective signals are well known and well understood, but before the advent of the waterfall display, there was no simple way to visualise them. Examples include key clicks, which stretch the broken vertical line traces of Morse code sideways, ie they add unwanted and interfering frequency modulation. In a similar way, any SSB spattering, previously audible but difficult to assess fully, is immediately and clearly represented to its full extent on the waterfall display. Correspondingly, the extent of interference received by others is readily assessed. Recently I heard a perpetrator of splattering, who proudly boasted how much power his new linear amplifier could put out. I was then amused to hear a '5 and 9+ with excellent audio quality' report returned to him. The respondent was apparently oblivious to the interference being caused to adjacent signals.

An odd, frequent event, previously often heard but not seen, is the rapidly-tuned carrier wave. This makes a loud squawk on everybody's receiver as the carrier passes through the listening frequency. A diagonal line traced across the waterfall display clearly reveals this kind of activity. It shows the effects of the user apparently spinning the tuning knob whilst still radiating a full power carrier. Sometimes the knob is seen to be advanced in a series of steps, and even moved back and forth. To those amateurs who carefully select a frequency, call to check if it is in use, and only then tune up, this behaviour will seem unnecessary and reprehensible.

Two other signal examples and their waterfall representations are seen in **Figure 4** and **Figure 5**. The second example came as a complete surprise. I sometimes noticed ghostly letters and numbers in the bandpass waterfall and wondered whether I was dreaming. This example of embedded information was obtained with the waterfall reversed (as described earlier). For more information on this, see **[8]** and **[9]**. There must be very many more unusual and interesting signals to be explored using the waterfall display Hopefully in the future, an article will illustrate the different types, to increase our understanding of faults and advanced modulations, in a non-mathematical way.

USE AS AN INSTRUMENT. As seen in Figure 3, yellow figures near the centre give the signal amplitude and frequency at the precise location of the vertical red-line cursor. Amplitude is measured on a scale with limits extending from 0dB down to about -160dB. The frequency also appears in large figures next to the word 'Tune'. Each spectrum window can be extended vertically to completely cover the waterfall display, and vice versa. Uses in quantitative and comparative attenuation measurements suggest themselves: the receiver is a spectrum analyser. I touched earlier on the subject of remote diagnosis of transmitter faults and operator error, for example distortion, over-modulation and splattering. The SDR receiver gives the impression of a very refined and expensive scientific instrument, delivered into our hands at very modest cost.

OVERALL IMPRESSION. This is an outstanding kit, capable of imparting advanced knowledge and practical skills to the inexperienced, for very modest outlay. The receiver covers approximately the upper third of the 80m band. The sensitivity, selectivity and noise rejection facilities are outstanding. In the recent difficult sunspot conditions, strong, clearly-intelligible signals have been received late at night from the Americas, with the usual inter-G and Continental signals at other times. I am in no doubt that more exciting DX will be received later. Listening to QSOs is made even more enjoyable by the knowledge that the passband can be tailored precisely, to give the best possible received signal every time. I have only touched on the facilities, but hopefully have indicated those that are more important to radio amateurs. Others remain in the drop down menus, to be explored as experience and familiarity are gained.

ACKNOWLEDGEMENTS. As indicated, the kit was purchased incognito rather than supplied specially for evaluation. I have no commercial connection with Kanga Products. This said, they have made a very well-packaged kit available at modest cost. I am most grateful to the Finningley Amateur Radio Society and in particular to Kevin Avery, G3AAS, for practical assistance in troubleshooting and valuable additional discussion. I feel that my desire for more experience in SMD and SDR has been very well satisfied.

At the time of writing, the kit price given on the Kanga Products website is £16.50 plus £4 P&P. The manuals and *WinRad HDSDR* software are all downloadable free of charge. Figure 1 and 2 are reproduced from Kanga documentation and used with permission.

WEBSEARCH

[1] www.websdr.org
[2] www.g0ghk.co.uk/sites/default/files/finningley_sdr.pdf
[3] www.WinRad.org/bin/WinRad_UG_1.32.pdf
[4] www.hdsdr.de
[5] *RadCom* November 2010, page 60 and September 2008, page 76
[6] *RadCom* January 2011, page 66
[7] www.g0ghk.co.uk/node/101
[8] www.qrz.com/db (and search under G4XGT)
[9] Data, *RadCom* April 2011, page 77

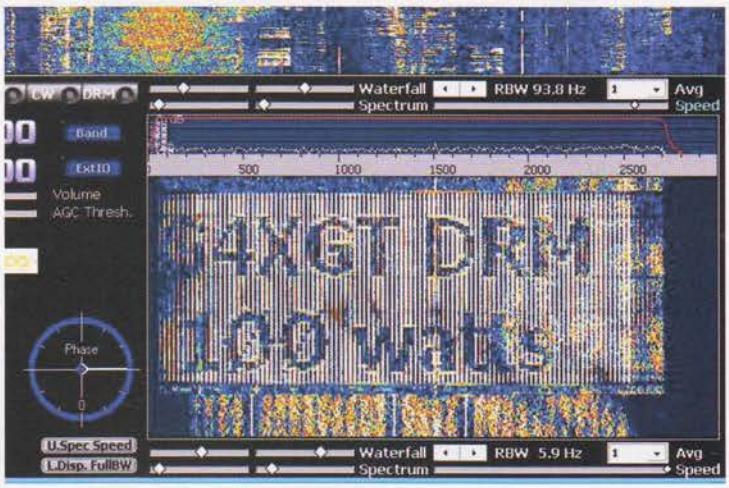

FIGURE 5: Signal with embedded information.

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IC-T70E 2M/70CM Handy ..... £158.00.
IC-E80D D-Star V/U ..... £320.00.
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FTM-10E - VHF/UHF tx/rx ... £309.00.
FT-897D - HF/6m/2m/70cm.. £779.00.
FT-817ND - 1.8-430MHz 5W. £549.00.
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 ..... £234.99.
Yaesu MD-100 mic ..... £118.00.
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 ..... £309.00.
RigExpert AA-230 ..... £442.95.
AA-230PRO ..... £520.95.
RigExpert AA-30 - HF Analyzer .. £269.00.
RigExpert AA-520 Analyzer .....£480.00.
RigExpert Plus .....£225.00.
RigExpert Standard .....£164.00.

HEIL SOUND Microphones & Headsets

PR-781-PTT deluxe base mic...£159.96.
Pro-Set-Plus Headset .....£219.95.
Pro-Set-Plus-IC Headset .....£239.95.
Pro-Set-HC-4/6 Headset .....£139.95.
Pro-Set-HC-IC Headset .....£149.95.
Goldline GM-4 Stick mic .....£139.95.
Goldline GM-5 Stick mic .....£139.95.
Goldline GM-V vintage mic ..... £149.95.
HM-4 Handy mic w/HC-4 insert £79.95.
HM-IC Handy mic + Icom insert £89.95.
HM-10-4 Hand mic + HC-4 .....£79.95.
HM-10-Dual mic HC 4+5 .....£119.95.
PR-20 hand microphone £119.95
PR-30 hand microphone ..... £212.95.
PR-40 hand microphone ..... £249.95.
Pro-Set-Elite with HC6 ..... £174.95.
Pro-Set-Elite-IC with HC-6 ..... £189.95.
Pro-Set-6 with HC-6 ..... £144.95.
HM-Pro mic ..... £89.95.
HP-Pro-Plus mic ..... £79.95.

COMET

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

Tigertronics

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

WATSON

POWER-MITE NF 22A peak £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 ..... £1.95 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
M/Mods 144/100 £149.00
Alinco DJ-X3 £89.00
EDC-16B adapter £9.99
WELZ DL-600 Dummy 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
SGC MAC-200 Antenna Controller Auto-Tuner £220.00
Kenwood SM-230 Station Monitor £499.00
MFJ-784B DSP Filter £219.00
Yaesu FV-101DM Digital Memory VFO £199.00
Icom ut-102 Voice Synthesizer Unit £25.00
AOR ARD9000 Digital Voice Interface. £126.31
MB-105 (IC-7000) MOUNTING BRACKET £7.95
Midland 48 Plus Multi £69.00
MFJ-1817 2m/70cm Telescopic antenna £22.00
CSC-83 Soft Carry Case for FT-817ND £15.00
Icom PS-85 Icom 20A 13.8V Switch Mode £159.00
Kenwood DFC-230 external digital freq contr £89.00
FT-290 MK2 Carry Case £15.00
Kenwood YG-455C-1 - CW Crystal Filter £89.00
Kenwood YG-455CN-1 - CW Crystal filter £100.00
FL-101 9MHz Filter CW narrow 250Hz £60.00
Icom FL-44 - SSB FIlter 455KHz £80.00
SC-45 Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
ALINCO ESC-28 £10.00
010-10117-02 Garmin GPSCarry Case £5.00
FT-290/790MKI Carry Case £15.00
HS-800/PRO High Sierra Control Box for 180 £75.00
BP-206 Lithium Ion Battery Pack £30.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
Eton S-350 Field Radio £65.00
Bremi BRL-5 - 3-way switch with 5Watt dummy load £20.00
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Yaesu SC-1 Station Console £89.00
Dee Comm Dummy Load £69.00
BRV-1 Mirror Mount £10.00
Yaesu CSC-92 soft case £10.00
25W Max Dummy Load £20.00
60W Max Dummy Load £35.00
300W Max Dummy Load £79.00
Antenna Switch £15.00
BP-262 Battery Case £7.00
Drake DL-300 Dummy Load £50.00
Revex L20 50 Ohm Dummy Load £25.00
MTU-30/20 RF u-tuning Unit C £500.00
MTU-80/40 RF u-tuning Unit B £500.00
Bush Sunrise Radio £49.95
CT-44 Microphone adaptor £6.00
KIF700 Keyboard & Interface £69.00
SC-37 Soft Case £6.00
SC-41 Soft Case £6.00
Diamond DL1000 Load £99.00
CT-5000 CTCSS Board for AR-5000 £60.00
Philips HC8349 Wireless Headphones £25.00
Toyo T-100 Dummy Load £59.95
MAG-BM145PL £14.95
MFJ-332B BNC Magmount £15.95
Yaesu BU-1 bluetooth adapter unit £69.00
SU-1 Barometric Pressure Sensor Unit £29.95
FTS-7A Tone Squelch Unit (CTCSS) £45.00
Yaesu XF-8.9KCN CW filter £40.00
Inrad Pre-amp board to fit FT-1000mp £57.50
UT-121 D-STAR digital unit for IC-E91 £139.00

Amplifiers
RANGER-811H Linear Amp UK 800W HF £849.00
EXPLORER 1200 Linear Amp UK 1200W HF £975.00
Kenwood VB-2200GX 2M Amplifier £79.00
Explorer 1000 1KW HF Amplifier £799.00
AL-811HXCE Ameritron 800W HF £849.00
Ampere APB-57A UHF Amplifier £129.00
MML 144/30-LS 2m 30W Amplifier £89.00
B-108G Mirage 2m Amplifier 10W in 80W out £89.00

Analyzers + SWR meters
YW-3 SWR meter £30.00
Diamond SX-400 VHF-UHF SWR Meter £70.00
Harrier SWR-1 SWR & Power Meter £15.00
PALSTAR PM2000AM Mobile Watt Meter £120.00
PM-2000 SWR & PEP Meter £99.00
KENWOOD SW-100 PWR/SWR METER £35.00
TOYO T-430 SWR £39.00
Tech TE-15 Dip Oscillator £88.95

Antenna
EZ-TUNE-7000IBOX High Sierra Control box £85.00
MC-4MT Mobile Cable £13.00
Heathkit HD-1424 Active Preselector £59.00
Arno 40m EH Antenna £99.95
MFJ-1788X Magnetic Loop Antenna £379.00
Telescopic 4m Band Whip £15.00

Antenna Tuners
Kenwood AT-120 ATU £99.00
MFJ-969 ATU £159.00
MFJ-948 ATU £125.00
Yaesu FRT7700 Antenna Tuner £69.00
MFJ-945E Mobile ATU £89.95
MFJ-994B 600 Watt IntelliTuner Automatic ATU £275
Yaesu FC-30 Antenna Tuner Unit £159.00
MFJ-989C MFJ 3kW ATU, ANTENNA TUNER. £292.77
Vectronics VC-300D Tuner with LED PEP Meter £199.00
SG-231 SGC Smartuner £275.00
MFJ-935B Loop Tuner £149.00
MFJ-924 MFJ UHF ATU £85.00
MFJ-994 Automatic ATU 1.8-30MHz 600W SSB 300W CW £255.00
MFJ-986 MFJ 3kW ATU, ANTENNA TUNER. £279.00
MK-II Multi-tuner £48.95

Books
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 1982 £10.00
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
ARRL Handbook 1988 £10.00
ARRL Handbook 1995 £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
Foundations of Wireless and Electronics 9th Edition £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
Now You're Talking! £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 Shamwick" £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 19th 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
ARRL Operating Manual £10.00

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 2970DX 10 - 12m " 150w" £249.95
Superstar 3900 Mutimode CB Radio £110.00
Magnum S-9 Multi Mode mobile Transceiver £240.00
Superstar 3900EFT transceiver £199.00
Maycom EM-27 CB Transceiver £55.00
DX-5000 K-PO
AM/FM/SSB 10/11 Meter £189.00

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

Filters (various)
Bremi BRL-10 - TVI Low Pass filter 27MHz £10.00
AEC LP-30 - Low Pass Filter £15.00
CF-30MR 30MHz LPF £34.95
Packer TVI Filter £9.95
Vanco HF Low Pass Filter £14.95
YK-88C-1 CW 500Hz Filter £59.00

Frequency Counter/finder
Watson FC-128 Frequency Counter £69.00

Handheld Transceivers
Kenwood TH-D7E Dual Band Handheld £220.00
FDC-450A 70cm Handheld £79.00
FDC-150A 2m Handheld £79.00
Quansheng 70cm Handheld £79.00
Quansheng 2m Handheld £69.00
FDC Battery £15.00
Yaesu FBA-39 dry cell battery case £15.00
Wouxun KT-689 2m Transceiver £59.00
CSC-90 Soft Case for VX-2E £10.00
FT-708R 70cm Hand Held Transceiver £49.95
FNB-82LI (Spare) 1000mA Lithium-ion Battery pack £18
DJ-175E 2m FM with battery and charger £60.00
CSC-72 Leatherette Case for VR-500 / VT-120 £10.00
SC-52 Real Leather Fitted Case for TH-F7E £10.00
DJ-175E 2m FM with battery and charger £60.00
Alinco DJ-S41 UHF Handheld £58.75
Jingtong JT-208 2m Handheld £49.00
Jingtong JT-308 70cm Handheld £49.00

HF Transceivers
TS-480SAT £629.00
Kenwood TS-870S HF Transceiver £899.00
Alinco DX-77E HF Transceiver bhi DSP FITTED £429.00
Icom IC-765 HF Base Transceiver £799.00
Yaesu FT-1000 "CLASSIC" HF Transceiver £1,399.00

Mics and Speakers
Yaesu MD-100 Desktop Microphone £95.00
SMC-34 Speaker/Mic with Vol Control £21.63
HM-133 Remote Control Micr£52.46
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
Eagle A069 Earpiece £5.00
YM-24A Speaker Microphone £25.00
NATO Morse Key £199.00
Ex-Army Key with Operators Unit £39.00
Star-Masterkey CW Keyer £49.95
MFJ-451X Morse Interface (no keyboard) £85
Kent Keyer £79.00
MFJ-550 Morse Key £19.95
WWII Morse Key £34.95
HK-703 Twin Paddle Iambic Morse Key £89.95

Power supplies
Bnos 20AMP PSU £99.00
Kenwood PS-30 PSU £89.00
Yaesu PA-11C £25.00
Kenwood PS-430 Power Supply £119.00
PT-1012 Microset 12A 13.5 PSU £109.96
POWER-MITE Watson 20A, 11 - 15V, £53.85
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
240V AC to 110V AC Dropper £20.00
Yaesu FP-8 PSU £69.00
Apollo CB-35 PSU £20.00
Micronta PSU £15.00
Altai RPS-1203 £20.00
Manson SPA-8230 PSU £65.00
Mini Power Supply £14.95
12Amp G-Comm PSU £30.00

Receivers
Icom IC-R7000 Mint Condition £550.00
Icom IC-R72 Receiver £399.00
Trio R2000 HF Receiver £299.00
Icom IC-PCR1000 Receiver £189.00
Yaesu FRG-9600 VHF / UHF Receiver £199.00
AOR AR-8600MK1 Wide Band Receiver £449.00
Yaesu FRG-100 HF Receiver £299.00
Icom IC-R5 Receiver £129.00
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AOR AR-3000A Wideband Receiver £450.00
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Icom IC-R3 Hand held Scanner £250.00
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USC-230 Uniden-Bearcat ScanCat 230 £99.00
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IC-7400 HF, 6m & 2m transceiver £849.00
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Design Notes

It can make sense to build your own sound card

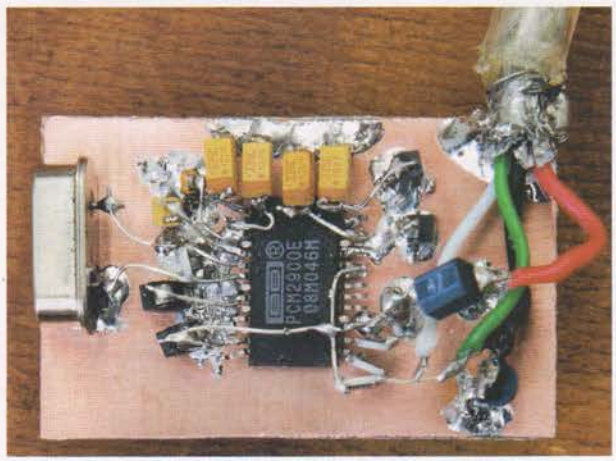

PHOTO 1: PCM2900 USB codec built using the 'live bug' construction technique. The USB cable (right) is hard-wired in.

USB CODEC CHIP. In the February 2011 Data I briefly mentioned the PCM2900 USB stereo audio codec chip, but without saying anything about how to use it. This created a fair bit of interest from constructors wanting to build soundcards into equipment such as SDRs, so here we look in more detail into how the device can be used – and its value beyond just adding another soundcard.

The PCM2900 is a single chip input / output facility providing stereo line-in and line-out interfaces at one end and a direct USB connection that can be plugged into a PC at the other end. This allows a second (or third, or more) additional sound cards to be installed on a PC, removing the need to keep swapping around audio leads and altering the Windows mixer settings. The chip needs no more functional circuitry than a 12MHz crystal, a handful of coupling and decoupling capacitors and a few resistors. Bear in mind, though, when building it into radio receivers, it's worth adding a few extra decoupling components to stop any RF leakage from the host computer arriving via the USB connection.

Figure 1 shows how the chip is wired up. Although the device has 28 pins, many of these are used for grounding or decoupling capacitors for the internal power rails. An internal regulator takes in the 5V present on the USB bus and generates 3.3V for the rest of the chip. Each portion of the internals running off this rail needs its own decoupling capacitor, so the relevant connection is brought out to a pin for an external capacitor. It is an ironic fact of life that low frequency high performance devices need all this extra connectivity just for decoupling. Chips used at RF can often have most of their decoupling inside, built using integrated components. Anyway, the result is a high specification audio interface with some 90dB dynamic range.

The data sheet indicates a chip current consumption of around 60mA when operational. A USB interface can normally supply 100mA without effort, so this leaves another 40mA at 5V available for other circuitry. It may be possible to draw more current without the PC complaining, but this will be on an individual case by case basis. In any event, critical applications where noise and interference could be a problem are better served with their own separate power supply instead of relying on the convenience of USB power.

CONSTRUCTION. The PCM2900 is in a 28 pin TSSOP package that is not terribly home-constructor friendly. The connection tabs are spaced by 0.64mm (a quarter of the pin spacing of traditional DIL packages) and the gap between them is only 0.25 to 0.4mm. But several options are available for home construction. My own preference is for a PCB using the iron-on Press-N-Peel PCB construction medium **[1]**. Press-n-Peel is at its best with this sort of tight compact layout with narrow tracks. A suitable design has continuous ground plane on the reverse (underside) of the PCB; signal and power lines are on the top, plus a few grounding pads with holes drilled and links soldered in strategic places – such as adjacent to each decoupling capacitor.

An alternative is a TSSOP adapter module such as the one described in **[2]**. This brings the compact pads out onto a more easily managed larger grid, to be used with larger components. On a low frequency design like this, the added track lengths of such an expansion board is of little consequence, although you should not really be using such an expander for RF devices at frequencies in the UHF and up range.

Or, you could try the breadboarding technique that I call live-bug construction **[3]**. It's like dead-bug, but instead of turning the chip upside down and bending down the ground connections, bend *up* the *non*-ground ones and solder the rest directly to a copper ground plane. **Photo 1** shows one unit built using this technique. TSSOP integrated circuits can be used this way provided suitable care is taken with connecting to their rather delicate tabs. Use as small as possible SMT capacitors in each decoupling position. Solder one end

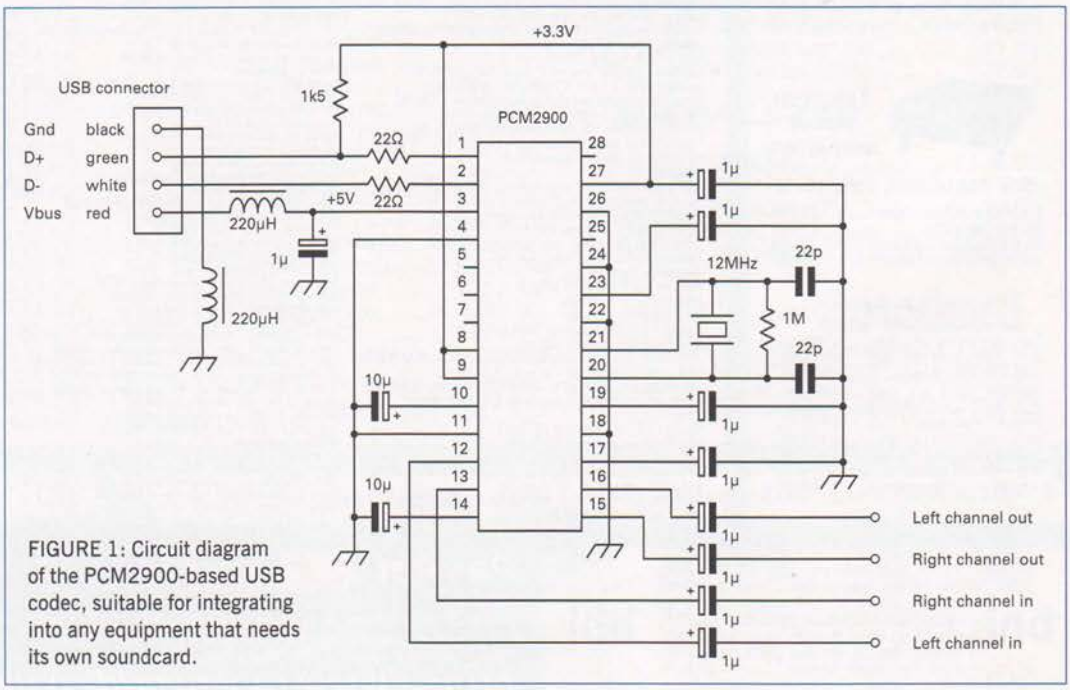

FIGURE 1: Circuit diagram of the PCM2900-based USB codec, suitable for integrating into any equipment that needs its own soundcard.

of these directly to the ground plane, placed reasonably adjacent to its associated pin – but not too close that it makes it difficult to get at the other IC tabs! Take a single strand of tinned copper wire (0.2mm diameter or less) from a piece of stranded cable and use this to connect each pin to its decoupling capacitor. The small diameter single strand gives sufficient stress relief to prevent damage to either the chip or the SMT capacitor. Wire up the remaining components using a piece of this wire for stress relief on at least one end of each. Resist the temptation to solder SMT components directly onto other ones – it is too easy to damage the plating on the connections when all are held together in a solid lump and then mechanically stressed.

There are two chokes on the USB connection ground and +5V lines in Figure 1. These are to reduce conducted interference from the PC from getting into the external circuitry. Also, any typical 220μH inductor has a few ohms of series resistance; this is advisable to reduce current surges and spikes when the connection is removed. The data sheet shows a 2.2Ω resistor in the USB power position for such current limiting reasons. The connections for a USB-A connector with the standardised colours are shown. A suitable connector can usually be found by cannibalising old computer junk – look around the rally stands. Not all manufacturers keep to the standardised colours. In this case, identify the ground pin by plugging the unknown lead into a PC and using a continuity bleeper to see which one is connected to chassis, then work along the pins identifying each in turn from Figure 1. Check that +5V is available when the PC is turned on.

USING THE INTERFACE. Once the interface is completed and the USB lead wired, plug it into a live PC. If all is working properly, the PC will (probably) go bloop and a window will pop up with 'New Hardware Found – USB codec' or some similar message. Or if you have already had another USB codec plugged in the past, it will just shrug its shoulders and accept this one without complaining. Go to your sound mixer icon and in the drop down menu of soundcards / properties, *USB codec* should appear (as in the left side of **Figure 2**).

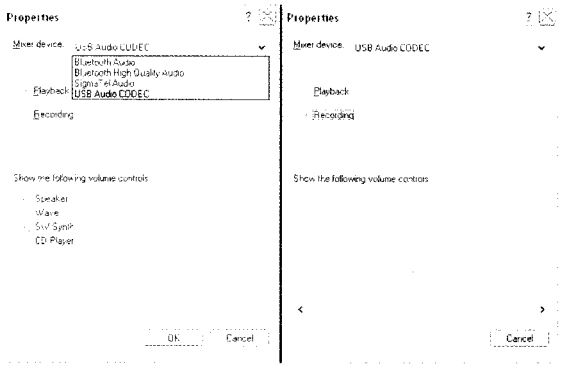

FIGURE 2: Setting up the USB codec in Windows.

On playback, this will look like any other soundcard, with volume controls for the sound sources. Use any audio source of choice – even a music player if you want, choose this USB codec as the playback medium and make sure audio appears at the codec's output pins. Now go back to the operating window and click on Recording Properties. This is where it gets interesting – and makes this chip infinitely more useful for amateur radio and the home laboratory than any 'normal' soundcard. *There are no record volume control settings.* This is brilliant! No unknown input levels, confusing Microphone and Line in, or spurious additional booster amps. It's a calibrated, reliable way of getting a signal of precisely known amplitude into a PC without custom hardware and software.

The PCM2900 data sheet [2] indicates that the full scale output from the chip is 0.6 x Vccci volts peak to peak. There is no stated tolerance on this 0.6 value so it should be accurate. Vccci is the internally regulated voltage (the one that needs so many decoupling capacitors) that appears on pin 10 and can be measured using any standard DVM. It should be nominally 3.3V but can range from 3.25 to 3.50V. Measure the actual value on pin 10 accurately and record the measurement. We now know that the full scale maximum, AC coupled to the left or right input will be 0.6 * this value. If the actual voltage was 3.30V, then a sinewave of 0.6 x 3.30 = 1.98V peak-to-peak will give a full scale output spanning the binary values -32768 to +32767. This is what software will measure and what is saved to a .WAV file when the USB codec is used to capture waveforms. You now have a calibrated AC voltmeter, accurate to probably better than 1%, with a flat frequency response from a few Hz to 0.45 of the sampling rate **[4]**. If you select a 48kHz sampling rate the frequency response extends up to around 21kHz. This opens up a lot of possibilities.

SOME HOMEBREW TEST AND MEASUREMENT IDEAS. Build one into a SoftRock receiver and have a single USB powered plug-and-play SDR box. Stereo line inputs are essential here, which the typical low cost headphone dongles do not offer.

Figure 3 shows an application using a double balanced mixer as an RF power meter. A carrier at the RF centre frequency is fed into the LO port, the test signal into the RF port and the IF, which must be DC coupled, goes to the codec input. A 50Ω resistor in parallel ensures the mixer is properly terminated. Frequencies up to 21kHz either side of the LO, a little over 40kHz in total, are downconverted to the audio range of this codec. With a bit of maths (and knowing the loss of the mixer, which is usually around 6 to 8dB for most diode ring types), we can get an absolute power level measurement if the absolute amplitude of the audio can be measured. The utility *SignalMeasure.exe* that can be downloaded from **[5]** will do this. The indicated value in dB indicates the average signal level relative to one 'quantisation step', so full scale indicated is around 94dB. We know this corresponds to 2V pk-pk, or a 0.707V RMS sinewave, which in turn corresponds to +10dBm. That +10dBm is more than most mixers can deliver; -7dBm is the typical maximum output from an SBL-1 type for it to remain within its linear range, so assuming 7dB mixer loss, we now have a tuneable (with the LO) absolute power meter that can indicate over a range of around -80 to 0dBm.

Other uses for absolute audio measurement and digitisation I'll leave to your imagination. How about an automatic noise figure indicator, using the audio output to switch a noise source on and off? Browse the software section of my website [5] for other soundcard based measurement utiiities, with the knowledge that using this codec as the input means that relative levels indicated can be turned into absolute values.

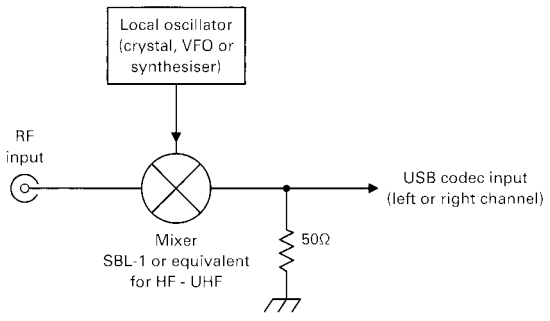

FIGURE 3: A diode ring mixer turns the USB codec into a tuneable wide dynamic range RF power meter.

WEBSEARCH

[1] Press-N-Peel PCB construction – www.semis.demon.co.uk/PCB/PCB.html
[2] 28 pin TSSOP Adapter – Farnell 142-6166, £3.82+VAT. PCM2900 – Farnell 120-7086, £7.68+VAT; www.farnell.co.uk
[3] Live bug because it is not lying on its back waving its feet in the air – and you stand less chance of destroying the device by getting the connections the wrong way round, trying visualise them reversed from those shown on the datasheet.
[4] Absolute calibration accuracy: the datasheet actually specifies around 1% gain mismatch between channels and 2% FSD gain error, but this is still a better, absolute, easily calibrated accuracy than is possible using a scope or a diode voltmeter.
[5] Soundcard Level measurement – www.g4jnt.com/SignalMeasure.exe www.g4jnt.com/dspsw.htm

IOTA

DXpedition roundup

(L-R) EA3NT, EA3OR, MM0NDX and EI6DX in their tent on St Kilda. Photo: F4BKV.

IOTA CONTEST. The 2011 IOTA Contest on 30 and 31 July is now only days away and is a great opportunity to catch a number of rare and semi-rare IOTA groups on the air. The really good news is that if the stations you work send in their logs for the contest then you can claim credits for your IOTA award on the rsgbiota website without needing to get the QSL cards. The contest runs from 1200UTC Saturday to 1200UTC Sunday and has a range of categories for different styles of operation. Full details can be found on the RSGB contest website at www.rsgbcc.org/hf/iota.shtml.

ALASKAN NEW ONES. The summer months are the peak period for activating island groups in the Arctic, where a number of new and rare ones are to be found. The focus this year seems to be on the Alaskan area but hopefully we will see more from the Russian Arctic in future.

Rick, K6VVA and Mike, K9AJ may still be QRV from the previously unactivated Point Lay Barrier Island in Alaska (NA-242) while you are reading this. They were scheduled to be QRV from approximately 22 to 26 July, mainly on CW. Mike, K9AJ may also activate the North Slope County North group (NA-172) immediately after the Point Lay operation.

Chuck, KL7OH plans to operate from Sarichef Island (NA-152) between 1 and 15 August. He will run 100 watts into a simple antenna so may be hard to hear from the UK. QSL to his home callsign, direct or via the bureau.

The Russian Robinson Club DXpedition to the unactivated St Matthew Island (NA-232) has been postponed to 2012 but club member Yuri, N3QQ, plans to operate as KL7RRC from Adak Island (NA-039) between 29 July and 3 August, IOTA Contest included. After that, if transportation is available, he will operate as KL7RRC/P from Kiska Island (NA-070), possibly between 6 and 12 August. QSL via N7RO or UA9OBA. Yuri and a few other members of the Russian Robinsons plan to be at the RSGB Convention in October to tell us about their past operations and future plans.

SCOTTISH ISLANDS. The MSOINT activity in June was extremely successful, with over 2000 QSOs from the Monach Islands (EU-111) and over 11000 from St Kilda (EU-059). The group operated from the old schoolhouse on the Monach Islands (see below) and, heroically, from the wind-blasted summit of St Kilda, where their tents and antennas barely survived the storms. The full story of this multinational DXpedition can be found at www.ms0int.com.

One of the delights of island activating is learning more about the history of the places being visited and, in Scotland, there are a number of organisations dedicated to helping with this. Top of my personal list is the Islands Book Trust based on Lewis in the Outer Hebrides that publishes books and arranges a number of conferences, lectures and island visits every year. Their website has full information on their activities and publications at www.theislandsbooktrust.com. I narrowly missed meeting the MSOINT guys in June when I was returning from a Book Trust outing to North Rona and Sula Sgeir. Sadly there is nothing to report on the radio front from my visit as I only took 6m equipment and the band was dead for the few hours I was on the remote location of North Rona.

I can also recommend the Scottish Islands Explorer magazine www.scottishislands explorer.com as a great source of information for anyone interested in visiting or working the Scottish Isles.

A rather more obscure group is the 'Friends of the Schoolhouse', based on Grimsey in the Outer Hebrides, which is dedicated to maintaining the abandoned school building on the Monach Islands as a place for locals and visitors to stay. I am particularly pleased that the descendants of the mid-20th century Monach residents are leading this venture and encouraging visitors to the islands – not only by maintaining the schoolhouse but also by constructing a small museum in the former chapel in the old village. Their approach contrasts sharply with that of Scottish Natural Heritage in the 1990s who resolutely opposed visits on the grounds that tourism was incompatible with the islands' status as a nature reserve – a concern that always seemed unfounded to me, as the cost and logistical difficulties of getting to the islands would place a strict natural limit on visitor numbers. Luckily SNH now seems to have a more relaxed view on the issue.

Schoolhouse on the Monach Islands. Photo: F4BKV.

IRISH ISLANDS. I have just returned from a short visit to a couple of the Irish IOTA groups with M0BLF and M0TOC from the Cambridge University Wireless Society. We operated from two radio-friendly hostels: Mainistir House on Inishmore in the Aran Islands (EU-006) and the Inishbofin Hostel on Inishbofin Island (EU-121). Thanks to some sponsorship from Spiderbeam we were able to leave a 12m telescopic pole at the Inishbofin hostel (together with 100m of coax) for future visitors, who now only need take wire and some tape or clamps to secure the pole segments to make a decent antenna.

The Blasket Islands (EU-007) are slightly more difficult to activate as good weather is needed for the crossing and the summer hostel/café has been closed for some years now. It looks as though a small group consisting of EI5JQ, EI9KC, EI4JZ, SQ7JT and SQ7NNM will be QRV as EJ0PL for the IOTA contest so don't miss a chance to work a rare one.

OTHER ISLANDS. Ma, BD4JWU will be active as BD4JWU/4 from Chang Island (AS-146) 29 to 31 from July. Look for activity on 80-10m CW. QSL via home callsign.

Operators F0GHK, F1SRC, F4EHM, F4FFZ, F4FHZ, F5CBQ and F6DZD will be active as TM2BI from Belle-Ile-en-Mer (EU-048) from 28 July to 2 August. They will be QRV on 80 to 2m and will participate in the IOTA Contest. QSL via F6KPQ.

For the fourth year in a row, Sarah, NQ6K expects to be working on Devon Island (NA-009, VY0) for the Haughton Mars Project and this time she intends being active on the HF bands from there. The field season is likely to run "from sometime around late June/early July through to early to mid August", with amateur radio operations during a two week period. Updates are expected to be posted to http://findatlantis.com/wiki/index.php/Devon_Island_2011_DXpedition.

The Inishbofin Hostel. Photo: M0BLF.

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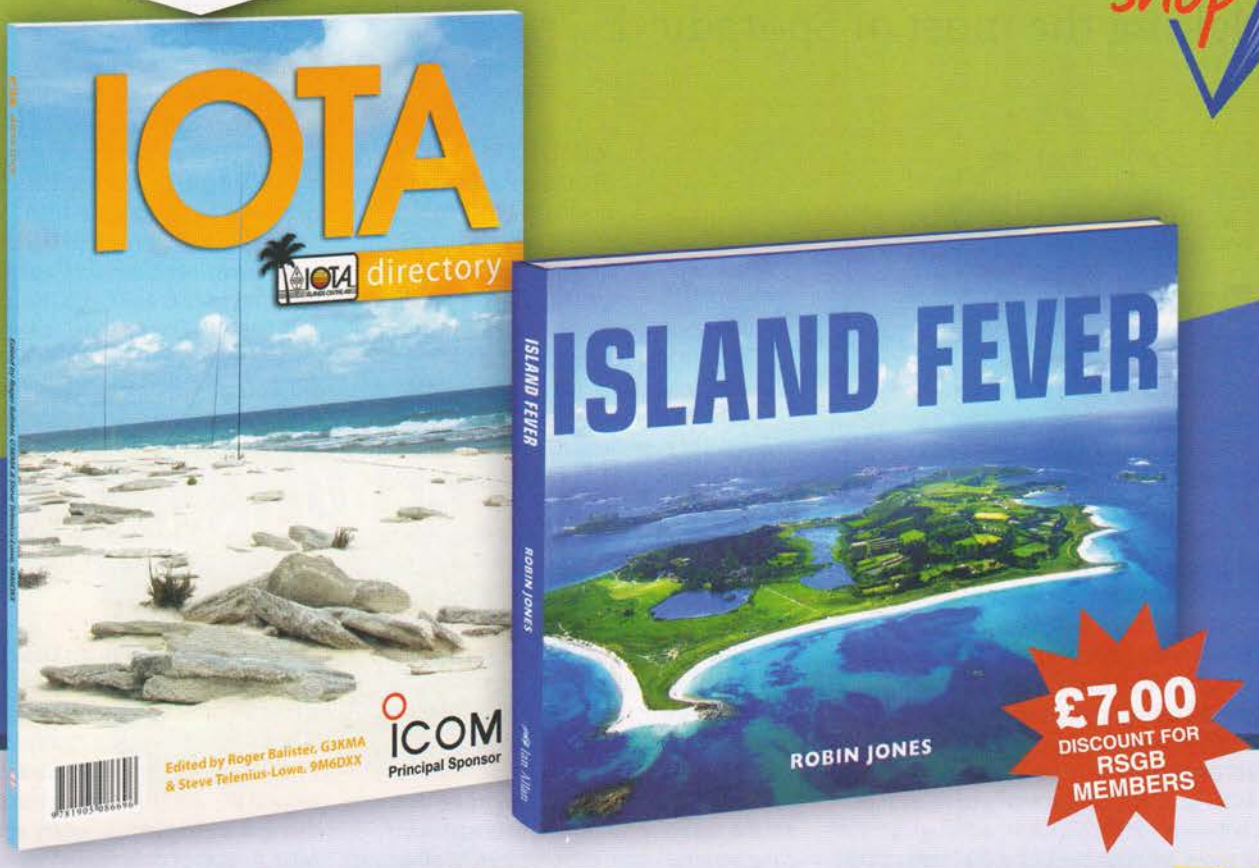

IOTA Directory

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Edited by Roger Balister, G3KMA & Steve Telenius-Lowe, 9M6DXX

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Making the most of Sporadic-E

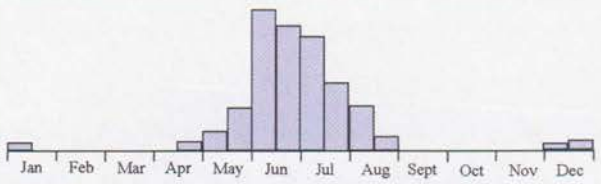


FIGURE 1: Yearly distribution of the likelihood of Es on 6m. Compress the window of opportunity for higher bands.

WHAT IS SPORADIC-E? Dense patches of highly energetic ions occur sporadically in the E layer of the ionosphere. These patches of intense ionisation reflect signals back to earth that would otherwise have escaped off into space. Sporadic-E (or Es) occurs on all frequencies up to about 222MHz. We only definitely know the propagation is Es when it is highly unlikely that is could be some other mode (such as reflection from the F layer). In other words, for most amateurs Es is most noticeable on 28, 50, 70 and 144MHz. Contacts generally have a range of between 1200-2300km, although shorter distances are possible during the more intense openings (and further contacts are also possible). The mechanism(s) that cause these 'clouds' (as they are called) is unknown at the moment, although there are several prominent theories for the trigger including thunderstorms, meteorite accumulation and ionospheric wind shear. What is understood is that the greater the intensity of the cloud, the higher the frequency it can reflect back.

WHAT DO I NEED TO MAKE A CONTACT? Sporadic-E is a great equaliser, as in general you do not need a big station to make a contact. What is more important is being in the right place at the right time so that your signal can reach the cloud at the right angle to bounce off it and come down in an area with another active amateur! That said, it is useful to be able to use a directional antenna and concentrate your signal towards the cloud. Contacts are usually made in SSB, because that's where the main long distance (DX) activity occurs, however there can be some impressive contacts made in FM, particularly when the openings favour north Africa where FM is much more commonly used. Having the same antenna polarisation at each end helps (usually horizontal for SSB and vertical for FM), however Es can twist the signal so you have to experiment to find what's best for each opening. Power does play a role, but when a cloud is capable of reflecting your frequency, DX contacts can be made with less than 10W.

WHEN DOES IT OCCUR? Sporadic-E is frequency-dependent so it occurs on the lower bands first and then works its way up to the higher bands. In the northern hemisphere Es can be present on 28MHz usually from April through to August or even September, peaking roughly in the middle of that period. For 50 & 70MHz the window is similar but slightly narrower and for 144MHz Es it is rare to have a good opening before the first two or three weeks of May; by the beginning of August the chance of an opening is pretty much over. There is a second, smaller window, usually around the middle to end of December but this is not normally as productive. **Figure 1** shows the annual distribution of Es on 6m for the northern hemisphere. For those in the southern hemisphere the time periods are the opposite, with the smaller peak in June and the larger in December. In other words, the main Es season is during your local summer time.

Sporadic-E is also time dependent, with openings occurring at all sorts of unusual times such as 0500UTC or 2300UTC on 144MHz just to add to the unpredictability. However, there are certain periods during the day when it is more likely that you'll encounter Es, shown in **Figure 2**.

DO I NEED ANYTHING SPECIAL? Es openings can last several hours on the lower bands but as you increase in frequency they tend to be shorter in duration. It helps to be swift and clear in your QSO. Most of the VHF bands have a centre of activity where initial calls are made and, in the heat of an Es opening, this can get very busy. So please try and spread out, listening and calling on frequencies around the centre of activity. It's also important to state both callsigns in your transmission to make it clear exactly who you're working.

Also, expect some exceptionally strong signals as amateurs from all around pile in to try and work some DX. In particular, this may lead to you hearing stations that you may consider to be rare but are actually workable via (say) tropospheric ducting. In this case, please be considerate and let them work the Es before they work you; you can always call them as soon as the opening is over and they'll be happy to work you.

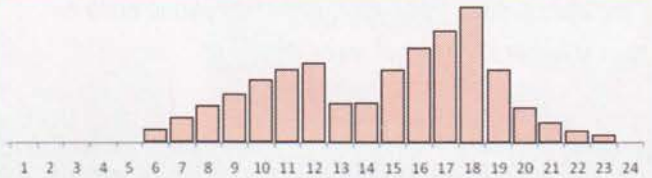


FIGURE 2: Hourly distribution (local) of the likelihood of Es on 2m.

DOUBLE HOPS AND 50.100 - 50.130. Sometimes, it's believed, two or more Es clouds can line up to permit contacts roughly twice the usual range of Es. When this happens it's sometimes possible to bridge the gap between two continents. Since this happens a few times a year on 50MHz (and more on 28MHz), there is what's called the Intercontinental DX Window, 50.100 - 50.130MHz. 50.110 acts like a calling channel (so you should make contact and then QSY) and up to 50.130 is reserved, by a gentleman's agreement, to be used exclusively for QSOs between stations on different continents. Therefore, unless you're attempting to work a different continent on 6m, you should call CQ above 50.130 (or call briefly on 50.110) and then QSY above 50.130. This will keep nearly everyone happy.

WHAT'S MUF? Maximum Usable Frequency is an estimate of the highest frequency that would be reflected when a radio wave is sent directly up into the ionosphere above. Only a limited number of scientific stations around the world are capable of measuring this and so, in general, we try and infer the MUF from the contacts that we make. We do this by assuming that the cloud occurs at the midpoint between the two stations and measure the distance (QRB) between the stations. As the MUF increases, the distance between stations (or 'skip distance') decreases. So, by observing several bands (or the DX Cluster) you can see where the cloud is, watch the distances creep in closer and then hopefully start to see long distance contacts appearing on the higher bands.

CONCLUSION. We've only scratched the surface of Sporadic-E propagation and it is far from being well understood. Get on the air, make a few contacts and let us know your experiences. If you want to find out more about the current state of Es we suggest looking at Dave, G7RAU's excellent live MUF software and participating in MMMonVHF Sporadic-E reports site (see Websearch).

WEBSEARCH

MMMonVHF sporadic E reports – www.mmmonvhf.de/es.php

G7RAU's LiveMUF software – http://g7rau.demon.co.uk/default.aspx?menu=25000

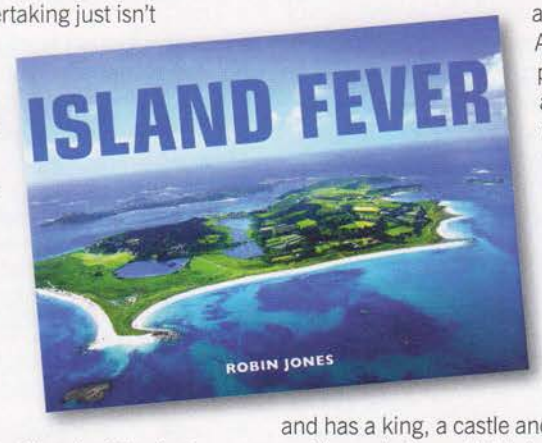
Book review

Islands and Antennas

Island Fever

by Robin Jones

This is not in any way a radio book, but it could be of interest to many radio amateurs. Have you ever contacted one of the big DXpeditions and thought about what it would be like to take part, only to realise that such a big undertaking just isn't practical? Many have and yet we are fortunate that there are those who are able to travel to the far flung corners of the globe.



But could you organise a much more modest DXpedition closer to home? That's where this book comes in. Island Fever is a guide to the islands of England and Wales, whether inhabited or not.

The author describes the island, its history, how to get there and who – or what – lives there. From the Isle of Wight to Farne Islands and Ramsey Island to Walney Island, hundreds of islands, large and small are described. For example, off the Cumbrian coast are the Furness islands – over a dozen of them. The largest is Walney Island, which is 11 miles long and less than a mile wide at its widest point. Around 13,000 people live there and it is linked to the mainland by the Jubilee bridge. Whereas Piel Island, in the same group, is just 50 acres of land off the tip of the Furness peninsula and has a king, a castle and a pub!

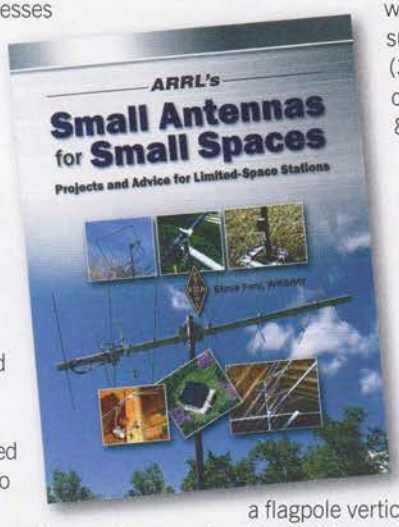
Now what has all this to do with radio? If you are looking for inspiration for a close-to-home DXpedition, this book will give you a starting point for your enquiries. Once you have read about which islands are inhabited, which are nature reserves, bird sanctuaries or site of scientific interest, you can start some research, perhaps using the internet, to locate you ideal DXpedition spot. The locations won't necessarily be rare squares, IOTA references or have exotic callsigns but they could provide you with a low noise setting, somewhere to try sea level antennas or just something a little different to add to your QSL cards. This book is beautifully illustrated with aerial shots, landmarks and panoramic landscapes. There are so many unusual island locations around the UK, many I'd never even heard about before, with long and interesting histories, that it should be possible to find a few unusual places to take amateur radio and enjoy a more modest DXpedition. If you never manage to organise your own DXpedition, after reading this book, you'll know more about some of the locations that others put on the air.

160 pages, 300 x 222mm approx
ISBN 978-0-7110-3471-6
Published by Ian Allen Publishing
Non-Members' price £19.99
Members' price £12.99 (35% off)

Small Antennas for Small Spaces

by Steve Ford, WB8IMY

Many people suffer with the problem of restricted space for their antennas. This practical new book addresses the issues from an American perspective. It examines at all aspects of the problem – identifying available space, choosing a suitable antenna, installing it with low visual impact (if possible) and operating within a framework of noise and interference issues. I was interested to note that the introductory chapter included a debate on whether a linear could compensate for a poor antenna – and generally decided no, because it does nothing to help your receive side.



I got the impression that "small spaces" has a different meaning in American English. There are some good discussions of different antenna strategies including putting antennas in your loft or around walls, but quite a lot of what I consider 'big' stuff such as a full-size G5RV (30m long) and an off-centre fed dipole for 80m (41m long).

Half way through the book I was surprised to find myself at an Appendix – "Antenna projects and useful information". HF projects include a 40/20m folded dipole, a 160 to 12m trap dipole (40m long, supported by a 47' (14m) tower) and a flagpole vertical in the middle of a sizeable front lawn that camouflaged the earth mat. There are also several VHF/UHF antenna projects and other useful information including a large table of coax cable losses (oddly, reprinted from earlier in the book).

My overall impression is that the American scale of things is at variance with the British idea of what constitutes a 'small' space. That said, if you do have the room, the information in this book is pretty good.

128 pages, 208 x 276mm approx
ISBN 978-0-87259-839-3
Published by ARRL
Non-Members' price £17.99
Members' price £15.29

If you haven't already tried the RSGB Bookshop online at www.rsgbshop.org then you may be missing out. The online book shop contains a vast array of publications on amateur radio and you'll sometimes find special offers that don't always appear in the printed version of *RadCom*. You'll discover full details of other special RSGB items such as callsign badges, clothing and members' offers.

RSGB Convention

7 to 9 October, Horwood House near Milton Keynes

LECTURE PROGRAMME. The provisional lecture programme can now be viewed on the RSGB website (www.rsgb.org/rsgbconvention/rsgb-convention-2011-provisional-programme.html) and will be updated weekly as more lectures are confirmed. Recent confirmations include lectures on EME, DXpeditions and data.

Tim Beaumont, M0URX will be part of the seven man team heading to Atauro Island (OC-232) in September this year. Less than two weeks after the end of the DXpedition he will be at the RSGB Convention with a report on the 4W6A operation.

Earth Moon Earth communications is one of the greatest challenges within our science based hobby of amateur radio. When explained and demonstrated to members of the public it never fails to capture their imagination, especially when they hear an echo returning from the Moon about two and a half seconds after the signal was sent, having travelled about half a million miles. Building a successful microwave EME station requires knowledge of basic astronomy, electrical, mechanical and radio frequency engineering, computing for the tracking system and for digital signal processing to assist with the resolution of weak signals. The construction of the antenna, tracking system and RF hardware will be described by Brian Coleman, G4NNS and recordings and spectral displays of Earth-Moon-Earth contacts on 10 and 24GHz will be demonstrated. EME systems can be used for some basic radio astronomy and this subject will be touched upon.

In an introduction to digital modes on the HF bands, Mike Richards, G4WNC will look at the different types of data modes that are available and explain their role in amateur radio. Mike will also run through the difficulties of sending data and describe some of the ingenious techniques that are employed to get the message through. The talk will conclude with a practical look at a few of the more popular systems and hand-outs will be available with a list of useful web links.

Since 2007, Nick Henwood, G3RWF has been travelling regularly to Western Uganda to work at a community university. His temporary amateur radio station with the callsign 5X1NH has now made about 80,000 contacts all over the world on CW, SSB and data modes. Nick will talk about some of the challenges and excitement that are faced as a solo operator. He will concentrate on practical solutions to getting on the air – solutions as relevant in the UK as they are in the foothills of the Rwenzori Mountains. He is planning to bring his suitcases with him: one contains a multi band beams, a single band beam and two verticals and checks in just under 23kg.

TICKETS. The online shop is now open for RSGB Convention booksings. The 'early bird' offers close on 14 August. Day tickets, weekend tickets and overnight packages are available as well as tickets for the ML&S buffet and DX Dinner.

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

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

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Principal sponsor for the RSGB convention & T32C DXpedition

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The FTdx5000 has landed at the World's Favourite Hamstore. To get a valuation on the very best HF transceiver available today, call 0345 2300 599 and get a trade-in value on your current kit or the very best outright buy. Either way, you just know you will be buying this important landmark in Japanese engineering from a company that understands and supports HF DX Amateur Radio.

FTdx5000: £4699.95 FTdx5000D: £4999.95 FTdx5000MP: £5399.95

For more information see: www.FTdx5000.com or see our Tube channel, search MLandSshop.

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Idiom Press

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Free standing, max 7.3m tall, 1kW

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5-BTV	80/40/20/15/10m	£224.63
6-BTV	80/40/30/20/15/10m	£265.48

Mobile Range
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Coax Cable Stripper
ONLY £45.99!

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

The UK's favourite rig-mounted antenna system

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COMET

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GP1	144/430 MHz 3.0 / 6.0dbi 1.25m	£59.95
GP3	144/430 MHz 4.5 / 7.2dbi 1.78m	£69.95
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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
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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
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SH95	144/430/1200MHz 37cm L 10W BNC	£30.60
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New Range to ML&S, HUGE DISPLAY, PEP & Average reading.

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Nissei	TX-502	1.6-525MHz, 2/20/200W	£89.95

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NEW

A complete remote control system for Amateur radio.
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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.

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SX-40C	144-470MHz X needle Mobile Meter	£88.85
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SX-27P	**COMPACT 144/430, 60W Portable Meter**	**£45.93**

Huge selection of Diamond products always available ex-stock.

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Miracle Ducker iL HF-70cm Mini ATU with BNC.....**£109.95**
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NEW Mini VNAPro Now with Bluetooth!

Only £349.95

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THREE NEW SUPER MODELS FROM LDG

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Z-100Plus	Ultimate autotuner for Yaesu FT-817D	£134.95
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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

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

Friedrichshafen Ham Radio Show

184 exhibitors from all around the world at the largest European amateur radio show

The RSGB bookstall was busy throughout the three days of the show.

MORSE CODE LIVES. This was the theme for the 36th amateur radio show in Friedrichshafen, Germany [1]. Throughout the three day show, various activities, talks and demonstrations of Morse took place highlighting this energy efficient was of communicating internationally. In the main foyer, DARC, the German amateur radio club, had an exhibition showing the history of Morse and where you will find it today – even in films and music. A particular emphasis throughout the show was the use of Morse in emergency situations.

During the opening ceremony a message was read out from Princess Elettra, Marconi's daughter regarding the value of Morse code to amateur radio promoting international friendship. The ceremony was attended by representatives from many IARU countries as well as those from national societies around the world.

The Horkheimer Prize was also presented during the opening ceremony. Rudolf Horkheimer was one of the first radio amateurs in Germany. The prize bearing his name is awarded for merit in amateur radio and its further development. This year it was awarded to Professor Wolf Harranth, OE1WHC for his work as curator at the Documentary Archive for the History of Radio Communication and Electronic Media [2]. The organisation collects whatever relates to the history of radio (with the sole exception of hardware: they are not a radio museum). There are around seven million objects filed and it is the world's largest organisation of its kind. Their collection of QSL cards, awards and logbooks covers the entire era from pioneer days to today.

MEETINGS. As so many National Societies attend this show, it's a good opportunity for meetings and these usually take place behind the scenes on Friday. The IARU Region 1 EMC Working Group will have its next formal meeting at the Region 1 Conference in Sun City later this year where a main topic for discussion will be the CENELEC Standard EN50561-1 (the draft standard which the EC hopes will apply to powerline adaptors in due course). The current situation is that CENELEC has taken on the work of CISPR to produce a European standard on home PLT devices. Some of those members involved in the work of CISPR have become involved in the new CENELEC group and the Chairman of the group has been tasked with getting that standard agreed. Once the draft standard has been published there will be about two months for discussion and voting from the national standards organisations of member countries. During the formulation of this document, the comments of around five IARU member societies (including RSGB) were submitted and some of their comments were taken on board such as the measurement and depth of notches in the amateur bands. So if this new standard is approved, there will be some certainty about the notching of the amateur bands. The rest of the short wave spectrum, however, will most likely continue to suffer extreme wideband noise from PLAs.

The meeting discussed the situation and it was suggested that the IARU Region 1 position on the draft standard needs to take into account the needs of radio spectrum users generally, and not simply the needs of radio amateurs. Interference mitigation techniques such as dynamic notching and dynamic power control are relatively unproven in a multi-user environment, and there is serious doubt as to whether adequate protection will be afforded to the rest of the short wave spectrum by the proposed standard.

The meeting discussed whether the EMC Working Group should recommend whether this proposed standard is something IARU members societies should support or not. After discussion the decision was taken to say 'no' to the draft standard. A document has therefore been circulated to all IARU Region 1 European member societies giving them the technical background, and asking them to recommend to their national standards organisation, who will make the national input to CENELEC the new document, that the draft be rejected.

Another group that will be holding their next official meeting in Sun City is the EUROCOM Working Group. One of the main aims of this group is to identify the areas of concern in European legislation regarding amateur radio before the legislation is finalised and making sure that member societies are aware of the legislation so that they can act accordingly.

In the last three years the group has organised the amateur radio exhibition at the EU parliament and made some useful contacts with MEPs including Birgit Sippel. She placed a question on PLT. The reply from the Commission doesn't directly answer the question; rather, it delegated lots of the technical information to CENELEC. EUROCOM is seeking another meeting with MEP Sippel to see if it is possible to ask another question to push the point.

UK company Waters & Stanton attended the show again this year.

One piece of legislation that is concerning the group is the tendency for national licensing authorities to ask for radiation hazard paperwork for amateur installations. This is something that is proving a problem for Greek amateurs, where they may end up with a reduction in power to avoid the radiation hazard legislation.

The IARU International meeting is a chance for national societies to bring to the talk the latest news or problems from each country. Whilst we in the UK may not always agree with Ofocm and the way they do things, once you hear about the relationship of the other IARU nations with their national regulators, you realise how fortunate the UK is. It seems that legislation regarding environmental protection is being used by some national regulators making it difficult for radio amateurs to put up new antenna systems or alter those already in place without commissioning expensive reports – 75 euros per case, which can mean each antenna you want to put up. This legislation has Greek radio amateurs facing a possible power reduction to 100W, only rising to 400 or 450W following a self-certification assessment.

Many of the national societies are struggling to keep numbers within the hobby. Finland was the only country reporting success with interesting young people. They have found that getting volunteers into the local school system running after-school clubs has been very successful. These clubs run various activities, including construction and operating, to keep the young people interested. The national society also encourages summer youth camps where youngsters get the opportunity to study and sit their amateur radio exams.

The South African society was looking at the problems of numbers within the hobby from another angle. They are looking into initiatives to encourage older people to get back into the hobby and they have identified a large number of lapsed radio amateurs within the country. For young people, the Novice licence has become part of the technology curriculum and this is attracting more young people.

Many national societies bring local produce to share with visitors: here's the Italian national society with their Parmesan cheese.

The RSGB took up the subject of EMC again asking other national societies to make sure they follow the IARU lead and contact their national regulators on the subject. As many societies are much smaller than the RSGB, it is more difficult to find the technical expertise within these societies and that's why the larger societies need to offer their technical support.

IOTA continues to be very popular in Europe and the IOTA forum was well attended giving Roger Ballister, G3KMA the opportunity to speak about the forthcoming IOTA 50th anniversary marathon. 2014 marks the 50th anniversary of the launch of the Islands on the Air (IOTA) programme by Geoff Watts, BRS3129. The celebrate this event there will be a two year period of activity when IOTA chasers and activators are encouraged to contact or activate as many IOTA locations as possible. The challenge provides a level playing field for everyone, whether they are newcomers or old hands because everyone starts with a clean sheet on 1 January 2012 **[3]**.

THE SHOW. There were only some new products on show this year. Icom showed off their new UHF D-Star digital transceiver. Called the ID-31E, it has a built in GPS receiver, is D-Star ready in addition to FM and it will have free cloning software available for download. The unit on show was only a mock-up (although a very good one). At present there are no details of the launch date or pricing. You can read more at www.icomuk.co.uk.

Bonito were showcasing the RadioJet 1102S. 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

As usual, at the Friedrichshafen Ham radio Show, the RSGB had a visitors' book. Those known to have visited the stand include the following:

2E0EOL
2E0FQV
2W0RWF
2W0RWF
4X1DF/ HB9JAJ
4Z1WF
9A2GA
9M2RT
9W1SGG
AK4IG
CT1FSO
DA1BP
DB2STR
DE1HEX
DF1MM
DF3SU
DF5UG
DG6PW
DJ2XB/ M0DXM
DJ5AV
DJ6UG
DK5FJ
DL1PBC
DL1ZI
DL4AKN
DL7LR
DL8YB
DL9HAL
DL9KI
DL9QR
DL9SAW
DM5RS
DO5TMM
DR11BUGA
DU1IVT
DU2VQ
EA1HEH
EA1LO
EA2SS/ LU5VC
EB1BDM
EI2CR
EI7GEB
EI9DZ
F4FRL
F5MSO
F5RRB
F5VHN
F6IAI
F9AEM
G0BBL
G0DWV
G0GGM
G0MQP
G0NFA
G0VDZ
G0VEH
G1PLT
G1SAA
G1SWH
G1UAF
G3ISB
G3KMA
G3LHZ
G3LQP
G3OGP
G3PYE/P
G3UVR
G3VLH
G3YBO
G3YSX
G4ANN
G4BWP/ A65BD
G4EFO
G4ERO
G4FOW
G4HGI
G4IUA
G4JDO
G4KDR
G4LLQ
G4LRP
G4LUE
G4NCI
G4PLY
G4PZK
G4TMC
G5LP
G5VO
G6HFS
G6MC
G6SSX
G7AIE
G7LWT
G7UUD
G8APB/ VA6APB
G8BXC
G8DZH
G8P
GI4VIV
GM0SEI
GM8OTI
GU0SUP
GW0ANA
GW0NWR
GW1SGG
GW4HAT
GW4ZAR
GW6STK
GW6STK
HB9CVQ
HB9EPA
HB9ICG
HB9IQ
HB9KNV
HB9KNV
HB9ZAP
I0UZF
I1LEP/ KI4VWW
I2FUM
I2HNX
IK2AQI
IK2JYT
IK2LFD
IK4RVG
IK5BDP
IK5ROT
IK6BAK
IK7IMK
IT9QJM
IW1FRD
IZ0EAN
IZ0EAN
IZ1MGH
IZ3ESV
IZ3ICE
IZ4COW
IZ4FTG
JA2AEV
JA2DJH
JA9ATR
LZ2CI
M0BTZ
M0BTZ
M0CAD
M0CFW/ JK3GAD
M0GUZ
M0KNG
M0LMH
M0ZAF
M1BXF
M1CYM
M5BMW
M5SJS
MI0UDX
MM0FMF
MW0BXJ
MW0BXJ
MW0GBR
MW0RKB
MW0RKB
MW0ZZH
OE5SYM
OE8RVK
OE8YMQ
OE8YSQ
OE9PWU
OK2KG
ON3PJO
ON4CO
ON4KGL
ON7PC
OO7O
OY9JD
PA0PA
PA1UCA
PA3ACJ
PJ0JF
PY4RGS
S51ZJ
SA0AQN/ SH8IP
SA0AZF
SM5SPEY
SS3IZ
TA1HZ
YO9APL
YT9T/ 9A1AZ

The YASME Foundation made a donation to part fund the international radio examination recently taken by a group of amateur in Ethiopia. RSGB President, Dave Wilson, M0OBW received the donation from Hans Blondeel Timmerman, PB2T.

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. The Bonito RadioJet 1102S is expected to be available from September with a selling price of 499 euros.

It was good to see Elecraft there with the recently launched KX-3. It's a QRP (10W) transceiver that covers the 160 to 6 metre bands with a general coverage receive facility from 1.6-30MHz. Operating on all modes, SSB, CW, data (four sub-modes), AM and FM, the built-in PSK/RTTY decode/encode allows data mode operation without a PC. Their stand was busy throughout the show.

Waving the flag for the UK, Waters & Stanton had a stand with Graham Somerville from bhi demonstrating his noise cancellation products.

Whilst 184 traders makes for lots selling space, that's not all you'll find at Friedrichshafen. On Saturday a weather balloon was launched with an amateur radio transmitter and camera on board. During the entire flight, digital sensor data, position and voice information was transmitted. Visitors also had the opportunity to contact the amateur radio station on board the Zeppelin airship that flies around the area.

Plenty of test equipment available.

FLEA MARKET. The flea market is a big attraction to many visitors and if you wanted some test equipment, this year was a good time to visit. There were many tables covered in various types of test equipment, from the old and slightly dented to brand new units that were surplus to contract. Whether you wanted meters, 'scopes or signal analysers there was a huge choice on show – although trying to get some of the kit home if you had a scheduled airline flight could prove rather expensive. Those travelling to the show by car – from a variety of European countries – were certainly taking advantage of the bargains to be had. If you were looking for portable masts, fishing rods for your antennas, components (especially valves), could take a whole day just to get around the flea market. One word of advice, it's best to see the flea market on Friday or Saturday, as many of the traders head for home a day early and the best of the bargains are long gone by Sunday morning.

HURRICANE PROJECT. Over the three days of the show almost 50 lectures take place as well as workshops and discussion groups. One of the lectures was on the Low Budget QRP Hurricane Project [4] given by Giancarlo Moda, I7SWX. The Hurricane project is a volunteer association with the idea of helping amateur radio operators support emergency communications in areas susceptible to hurricane damage. Many of those countries affected by hurricanes are under developed and the amateur radio population often has little in the way of equipment. This association is planning to build 2-band QRP transceivers that can be donated to amateurs in these areas so that there will be an emergency communications infrastructure during the hurricane season.

The design started as a 40m QRP SSB transceiver, just a basic superhet design. The prototype was been built, tested and modifications done to make it as efficient as possible. Now it is a 2-band (7 and 14MHz) transceiver with an integrated CW keyer, digital VFO and 5W output.

The group are looking for supporters to help keep the project going and you can find out a lot more on their website [4].

WEBSEARCH

[1] www.hamradio-friedrichshafen.de/ham-en/index.php
[2] http://tinyurl.com/RC-8-11-DOC or www.dokufunk.org/index.php?lang=EN&PHPSESSID=fe79a9f0f42d45038e091a3d6b920e20
[3] www.rsgbiota.org/marathon/index.php
[4] www.hurricaneproject.altervista.org

Elecraft demonstrate the KX-3 QRP transceiver.

Representatives of the IARU.

Watson Professional Weather Station

FEATURES. As well as the usual range of temperature, wind speed/direction, humidistat and rain gauges, this new weather station adds light (kLux) and UV level measurement. It even has solar power for the remote transmitter, avoiding the problems of having to access the remote unit to change batteries.

The weather station is supplied disassembled but construction is very simple. A screwdriver and pair of pliers is all you'll need. In addition to the plastic arms that carry the sensors, the weather station includes a couple of short metal poles that slot together to form a short mast that can be mounted on a more substantial post using large jubilee clips (supplied).

Mounting the sensors onto the plastic arm was very easy as there were locating pegs and screws for each item that made for a very positive fit. As you can see from the photos, the wind speed and direction indicators are mounted in the clear at the top of the assembly with the rain gauge and light sensor/humidistat on separate sensors just below. The bar supporting the wind sensors was placed East to West so the solar cell and light meter could be mounted on the South side and the rain gauge opposite on the North side. All the sensors were pre-wired – you just need to plug the sensors into the appropriate sockets.

The final task is to fit the two rechargeable AA cells (supplied) in the transmitter and strap the sensor to the mast. There is not much work to do to the base unit other than insert three AA batteries (not supplied). As soon as the base unit is powered up it starts to search for the outside unit and readings are displayed. The entire process from opening the box to completion took little more than half an hour.

The base unit has a very detailed display with most of the measurements available at a glance. The measurements from the sensors are updated every 48 or 60 seconds. Each of the sensors can be set with high/low alarms to give you warning of particular weather condition that could be useful to spot that elusive VHF lift. If you want to keep records of the changing weather situation, you can use the supplied Easyweather Plus software to download and analyse the data on your PC. The weather station uses a standard USB connection to the PC link and both cable, software and printed manual are supplied – makes a nice change!

QRP

SSB backpack pedestrian mobile to VK

Mark, M0MJH working from the Isle of Arran.

LONG PATH QSO. I have received a report from Dave Starkie, G4AKC, that reads, "Yesterday evening (3 May 2011), Mark, M0MJH, working from the Isle of Arran as MM0MJH e-mailed 3 stations in VK7 (Tasmania) that had been worked by GS3PYE/P also on the Isle of Arran with a view to setting up a sked on 20m longpath this morning (4 May) somewhere between 0600 and 0730UTC using his QRP HF backpack setup. A few hours later he had received e-mails back from Laurie, VK7ZE, Norman, VK7AC and John, VK7XX who all agreed that they would do their best to be on the air to call Mark. The time and the frequency of 14.3425 was set.

"Mark managed to drag himself out of bed at 0530UTC (0630 local time) this morning, grab his backpack, head out of the house and wander down the driveway away from the house so not to wake those still sleeping. He started calling CQ VK longpath on the agreed frequency for 5-10 minutes with no response and then heard John, VK7XX saying that there was a lot of QRM from a station on a nearby frequency and to move up. The frequency was changed to 14.347 and Mark started calling again, this time he was greeted by an S8 signal from John and was informed that he was being received at 5 and 5 in VK7. John asked Mark to stand by for a minute whilst he called Laurie and Norman on 2m. A couple of minutes later Laurie, VK7ZE appeared with an even stronger signal (S9) and told Mark that he was S7 at his QTH. Mark chatted with both stations for around 10 minutes with solid copy on all sides of the QSO before Laurie and John had to go QRT. Thanks were passed between all stations and they parted company.

"Mark's QRP HF backpack consists of a Yaesu FT-817ND, an LDG Z11pro automatic ATU, a 16ft (5m) long Racal whip and a 16ft long trailing counterpoise wire. These are mounted on an RT320 Clansman radio frame and the power is drawn from a 12V 7Ah mounted battery."

CONTRASTS AT THE DAYTON HAMVENTION. As I write this, I am recently returned from the Dayton Hamvention, in Dayton, Ohio. It is the world's largest amateur radio event and includes the QRP ARCI 'Four Days in May' QRP symposium. Dayton is a showcase for all manner of amateur radio equipment, with many QRP examples.

THE ELECRAFT KX-3 QRP TRANSCEIVER. This year, at Dayton, Elecraft showed off their latest QRP offering, a fully featured, self contained, portable, transceiver designated the KX-3. Measuring only 3.4"H x 7.4"W x 1.7"D (86 x 188 x 43mm approx) and weighing 18oz (510g), it has rear tilt feet that fold up for transport. The KX-3 is full of all the latest features expected of a top of the range transceiver. It covers the 160 to 6 metre bands with a general coverage receive facility from 1.6-30MHz. Operating on all modes, SSB, CW, data (four sub-modes), AM and FM, the built-in PSK/RTTY decode/encode allows data mode operation without a PC.

The photograph shows that is a handsome piece of equipment. The front panel emulates the Elecraft K3 transceiver design with a custom high-contrast LCD alphanumeric text display. On transmit there is an adjustable output, 0.1 to 10W+ (100W+ with the KXPA100 amplifier) including a rugged, SWR and temperature-protected final amplifier stage. A built-in antenna tuner is available as an extra. Portable operation is aided by a current drain as low as 150mA in receive mode. A power amplifier output impedance switch allows efficient 5 watt use from internal batteries, or 10 watts from external supply. There are too many features within the KX-3 for me to mention here. The Elecraft website can be found at www.elecraft.com and Steve Fletcher, G4GXL, the webmaster of the QRP ARCI, persuaded Wayne Burdick of Elecraft to do a quick 5 minute demo of the KX3 at www.qrparci.org.

THE HAM CAN MINIMALIST QRP TRANSCEIVER. Announced at OzarkCon 2011 and kitted and offered for sale by the Four State QRP Group, the Ham Can transceiver is the latest offering in minimalist amateur radio from the Four State QRP Group. The Ham Can is a crystal-controlled CW transceiver, delivering 0.5 to 1W transmit power, with enough sensitivity and selectivity to receive plenty of signals. It does all this with only two transistors!

The Ham Can is a minimalist transceiver designed to be very simple and inexpensive, yet provide surprisingly good performance. The Four State Group say the low cost kit sacrifices nothing in the way of quality. It features a high quality printed circuit board, low parts count and fast and easy building. It is an excellent kit for first time builders, and was chosen as the Build Session kit for OzarkCon 2011. OzarkCon is a QRP Conference hosted by the Four State QRP Group and held in April of each year in Branson, Missouri. Amateur radio enthusiasts from around the USA gather for two days of QRP related activities.

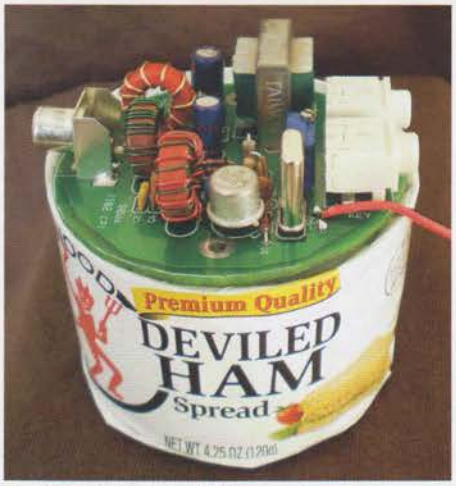
The NMOS design features an innovative power switch. The straight key plug also serves as the on and off switch. Just plugging in the key powers up the rig automatically. Designed to be as small as possible and still use through hole parts, it will fit on top of a 3oz ham snack can, while a 9V battery resides inside the can, thus making self contained portable rig. In the USA, brand names with cans this size are Armour, Bryan and Fancy Feast but others will have to be sought in the UK. The builder can enjoy a snack while obtaining the enclosure!

SPECIFICATIONS AND DESIGN FEATURES.
Receiver: Regenerative crystal-oscillator-filter design, with smooth and easy regeneration control from a 25 turn potentiometer. Crystal controlled on 7122kHz. Plenty of sensitivity for 40 metres – audio stage drives earphones. Full QSK, you can hear received signals while you are transmitting.
Transmitter: Keyed oscillator operating in Class C with 0.5 to 1 watt output into 50Ω, 600Hz offset to facilitate hearing the other station.

More details and full kit documentation can be found at www.wa0itp.com/4sqrpkitindex.html.

What could be more different than the KX-3 and Hamcan? A good illustration of the variety in QRP operation!

The Elecraft KX-3 QRP transceiver.



The Ham Can minimalist transceiver.

Radio Orienteering Event

Club-organised ARDF events can be very successful

Most of the gang.

ARDF EVENT. Sunday 8 May saw another very successful ARDF – Radio Orienteering event organised by the Oldham Amateur Radio Club. Eleven competitors from all parts of Britain took part and thoroughly enjoyed the challenging courses.

The day was billed as a fun event but it was competitively raced nonetheless and comprised two courses. The first, run in the morning, used 80m transmitters and the second, run in the afternoon, used 2m transmitters. The event was held in an area known as Crompton Moor, situated on the hillside high above Shaw near Oldham. it is not a large area but this is made up for by the complex terrain of moor land, a played-out quarry and sharp rises and falls of the wooded and open hillside.

THE COURSES. For each course, five transmitters were hidden with an optimal course length of approximately 2.5km and a time limit of 90 minutes. It was a measure of the quality of the courses that the best times were around the 35 to 40 minute mark, the slowest around the time limit and a good spread in between. Most importantly, however, every competitor said they found the courses interesting and enjoyable.

The weather was extremely kind, being predominantly sunny with the occasional dark cloud and gusty wind – but no rain. I know that Phil, MOGIE would claim credit for the weather – if we let him – but I am sure that we have a higher authority to thank for that. Phil organised the event and he was duly given a vote of thanks by Bob Titterington, G3ORY, author and ARDF driving force within the UK.

TEAM EFFORT. Of course, to make a successful event a team is required and praise must go to Geoff, G0BJR, for without his (and Phil's) mountain goat skills, the transmitters would not have been placed out in the field. Alan, G4GLV and Sue, G0RKE played their part as the timing marshals at the start and end of the courses. Other members present were Graham, 2E0ORC & son and Mike, M1CVL. A special mention must go to John, 2E0JSN who became the first OARC member to take part competitively in an OARC ARDF event – well done John!

CHALLENGES. The event ran smoothly. But, at around 10.30 our peace was, well not exactly shattered but maybe rustled a little, by the pops and bangs of a clay pigeon shooting party on the other side of the valley. Phil went to seek reassurance when some of our competitors complained that they had experienced fine shot raining down on them. The clay pigeon shooting club, who meet every other Sunday, were very helpful and friendly and did give every assurance of our competitors' safety, stating that they used very fine shot that had absolutely no power over about 100 metres; they also had their outer 'red flag' perimeter and guard posts set at 300 metres.

RESULTS

80m

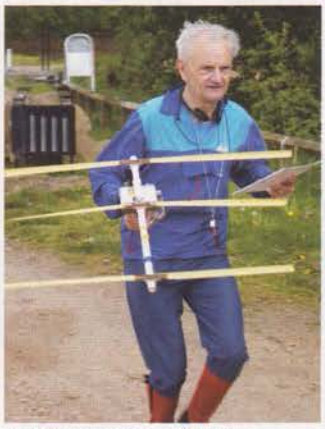
Name	Start	Finish	Minutes taken
David Williams	11.00	11.41	41
Bob Titterington	10.20	11.07	47
Stuart Tyler	10.45	11.52	67
John Martin	10.40	12.02	82
John Merriot	10.50	12.14	84
Tom Mitchell	10.35	12.01	86
Andrew Soleski	11.05	12.34	89
Keith Mahood	11.05	12.34	89
Tim Ravon	10 15	11.47	92
Stuart Cartlidge	10.55	12.28	93*
John Slattery	10.30	11.51	81**

2m

Name	Start	Finish	Minutes taken
David Williams	12.55	13.30	35
Andrew Soleski	13.15	13.50	35
John Merriot	13.00	13.50	50
Bob Titterington	12.40	13.31	51
Stuart Tyler	12.45	13.51	66
John Martin	12.30	13.40	70
Tom Mitchell	12.50	14.10	80
Tim Ravon	12.35	14.04	89
Stuart Cartlidge	13.10	14.37	107
Keith Mahood	13.05	14.22	77**

* Only 3 controls found.
** Only 2 controls found.

Keith Mahood, G0OXV.



Bob Titterington, G3ORY

John, 2E0JSN, getting last minute advice from Tom.

National Hamfest

30 September & 1 October, Newark & Notts Showground

Bonito will be making another trip from Germany to attend the National Hamfest.

FLAGSHIP EVENT. The National Hamfest will take place at the George Stephenson Pavillion, Newark & Notts Showground, Lincoln Road, Winthorpe, Newark NG24 2NY on 30 September and 1 October. Around 3000 visitors came through the doors last year and this year's show is due to be bigger than ever.

OVERSEAS VISTORS. The RSGB & Lincoln Short Wave Club are pleased that the ARRL are attending from the USA again this year. Joining them will be the German companies Spiderbeam, Tecadi and Bonito plus Czech company Mastrant, as well as all the major manufacturers and dealers in the UK. Spiderbeam specialises in fibreglass and portable HF antennas. Their full size lightweight tribander Yagi for 20-15-10m is made from fibreglass and wire. It has been specially developed for portable use and is particularly popular with DXpeditions. Tecadi are suppliers of stackable mast-tubes made from high quality glassfibre. The mast poles were formerly used by the army as tent-poles for general use. They have a diameter of 35mm and 2.5mm wall thickness.

Bonito will be bringing an all new, high performance, receiver with continuous coverage from 9kHz through to 30MHz in 1Hz steps. SSB, AM, FM and stereo DRM reception modes are included as standard. Performance looks exceptional, with an expected sensitivity of 0.03μV and a -137dB noise floor. The receiver is entirely controlled via the USB port using dedicated software designed for Windows based PCs.

Another company that exhibited at Friedrichshafen this year is Mastrant, who specialise in synthetic guy ropes and the accessories to secure your masts safely. They also have everything from safety harnesses to stainless steel spring hooks.

MOBILE FLEA MARKET. The mobile flea market is outside space reserved for private sellers only. Although no vehicles or goods may be left on the space overnight, sellers can camp overnight in the camping area and return the following day (you will need to purchase two days' Flea Market tickets and a camping permit). Access for setting up is from 7am on both Friday and Saturday.

ONLINE SALES. Advance tickets are available from the National Hamfest website and there are discounts available for booking single or multiple tickets.

RadCom

HF F-Layer Propagation Predictions for August 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	6.....667	85.....4888	572322347888	..777677785.	..67877788..	.....6...	.....	.....
*** Asia								
Yakutsk	.....	.....	4.....35665	.36666677773	...6764.....	.....	.....	.....
Tokyo	.....	.....37..	.....5..	.....	.....	.....	.....	.....
Singapore	.....22.	.....788.	.....674.	.....66..	.....466..	.....4...	.....	.....
Hyderabad	.....	455	3665	.....3555.	.....34...	.....	.....	.....
Tel Aviv	92.....899	99.....28999	.34....58886	..353357783.	...44...66..	.....	.....	.....
*** Oceania								
Wellington	.....	.....	.....	.....	.....	.....	.....	.....
Well (ZL) (LP)	.....	.33.....5..	.34.....3..	..3.....3.	.....	.....	.....5.	.....
Perth	.....	.....563.	.....54..	.....	.....	.....	.....	.....
Sydney	.....	.....67..	.....266..	.....	.....	.....	.....	.....
Melbourne (LP)	.....	.597.....	78992.....3	77896.....37	...7.....77	.....7.	.....	.....
Honolulu	.....	.....	..52.....	...44.....	....5.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....4...	.....	.....	.....	.....
W. Samoa	.....	.....	.....	...333.....	...4555.....	.....	.....	.....
*** Africa								
Mauritius	2.....122	6.....6887	8987	.....5887.	.....55..	.....	.....	.....
Johanesburg	.....	452	8873	.....87..	.....37...	.....6...	.....	.....
Ibadan	11.....11	67.....666	673.....4777	.57....37875	..76..3588..	...7....88..	.....87..	.....5...
Nairobi	4.....33	84.....2888	64.....4666	.3.....6776	..3....5776.	.....4666..	.....64..	.....
Canary Isles	77.....667	877.....2888	8884...27888	63863...8888	..7998899997	...88888997.	...4....67..	.....5..
*** S. America								
Buenos Aires	.....	544.....3	868.....78	4.5.....376	.....55.	.....5..	.....	.....
Rio de Janeiro	.....	655.....46	878.....788	5.5.....887	.....86.	.....74.	.....5..	.....
Lima	.....	533.....3	7673.....68	3..5.....76	.....4.	.....	.....	.....
Caracas	.....	32.....3	8784.....78	5.573....588	65445784	.....4.675.	.....4..	.....
*** N. America								
Guatemala	.....	222.....	6663.....7	36	.....3.	.....	.....	.....
New Orleans	.1.....	663.....2	676.....6	57	.....4.	.....	.....	.....
Washington	33.....	774.....6	7773.....57	3...4....577	.....44.456.	.....	.....	.....
Quebec	65.....5	773.....57	4.3.....377	.....33567.	.....	.....	.....	.....
Anchorage	.....	.....	543.....4	66664	.....5677.	.....	.....	.....
Vancouver	.....	.....	.....	.....	.....4..	.....	.....	.....
San Francisco	.....	.2.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....	.....	.....	.....

KEY: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low 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 August, September and October are respectively (SIDC classical method – Waldmeier's standard) 64, 70 & 75 and (combined method) 66, 72 & 77. The provisional mean sunspot number for June 2011 was 30.2. The daily maximum / minimum numbers were 89 on 2 June and 13 on 13 and 27 June.

LF

How low can we go?

DF6NM's modular VLF loading coil system.

SLF. We seem to be in a downward spiral at the moment, first LF, then VLF, and now some listeners have been delving into the depths of the super low frequencies (30 to 300Hz). These frequencies first came into use during the Cold War to send messages to submarines deep beneath the oceans of the world. The American system operated at 76Hz, but that hasn't been used for many years. The one active today is the Russian ZEVS system on 82Hz, a wavelength of 3,658km! A conventional aerial system for this low a frequency would be impossible to construct and, in fact, ZEVS uses the earth itself as its aerial. Two earth systems in boreholes about 120km apart form a 'magnetic dipole', a similar idea to that used on a much smaller scale by experimenters. These earth connections are fed by overhead cables carrying 300A of 82Hz current from a generator station near the centre.

The messages are sent as a sequence of different frequencies between 80.8 and 83Hz. Most listeners, such as Eddie, G3ZJO, seem to be using e-probe aerials that have been modified to extend the LF response – and are getting reasonable results. Obviously it's a strong signal but the problems of detecting it amongst all the other noises we have to contend with in urban areas make it an interesting project.

UP TO VLF. Stefan, DK7FC has generated a bit more activity recently, both from a fixed station and from portable operation. His tests from the fixed station didn't reach much further than DF6NM in Nurnberg, about 100 miles away, but even that is pretty impressive on a 'small' aerial. On 18 June he was out with the kite for the 11th time and, despite increased summer noise levels, was received in the UK again on both 8.97 and 6.74kHz. Reports also came in from Iceland, Germany, France, Italy, Romania, Austria, Czech Republic and Poland. Both G3ZJO and G3KEV reported reception of his signals in QRSS60 mode, so there would be the possibility of a QSO over the distance.

I tried to receive Stefan's transmissions with a modified PA0RDT e-probe aerial as far away from the houses as I could get it, but I failed. It just reminded me how difficult this low-frequency stuff is, especially if you live in a noisy city!

Stefan is promising to be back kite-flying in September and hopes to get a signal into Spain and Russia.

Markus, DF6NM was also out with a kite one evening in June, from a disused air base south of Nurnberg. His signal was just detectable at TF3HZ, 2547km away and was widely received around Europe. He was flying 180m of thin plastic-covered wire, 150m of it running up to the kite and the last 30m dangling down from the kite. The exciter was 100W car audio amplifier powered from an auxiliary battery that Markus periodically charged from the car. To resonate the aerial, Markus uses a series of buckets wound with thin enamelled wire that he places in series to achieve the desired inductance of about 350mH. On this occasion he used three buckets, closely spaced, as seen on the left of the picture. Unfortunately, the distance between the coils was not enough to stand full power and some arcing took place. Next, time he plans to use the four bucket Lego system as seen on the right!

136kHz ACTIVITY. Static levels tend to be high at this time of year but a period of disappointing weather in June meant that there wasn't very much noise and the band has been in quite good shape, with reasonable levels of activity on QRSS and WSPR but very little CW.

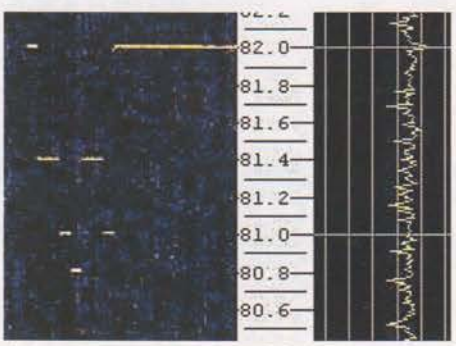
F8BOJ has been improving his station and is now back on the band with a strong signal. His new transmitter uses four IRFP250 MOSFETs running from 48V at 5.5A and gives about 200W output. He is constructing a large variable power supply capable of up to 50V and 12A so more power is possible in future. The aerial is a 270m long inverted L up at 34m.

VE7SL in Mayne Island has also been busy with the soldering iron and his new '2200m kilowatt' has been undergoing on-air tests on 137.777 in QRSS60. That's a tough test and it passed with flying colours, so expect some good results from Steve this winter.

In between VLF experiments, DK7FC has been optimising his 136kHz station and is now radiating a good signal on the band. He has been copied by G3WCB and others. He also runs a 136kHz grabber at his Heidelberg QTH, which seems quite sensitive. There's a link on his QRZ.com page.

500kHz NEWS. A new experimental station from Germany has been heard on 505.1kHz. The German authorities don't allow these special calls to communicate so they just radiate beacon signals, usually in QRSS. This station is located near Berlin and uses a 50W transmitter into a 16m high top-loaded vertical. Also back on the air is DI2AN on 505.15kHz. Horst, DO1KHS has received a permit to operate this beacon until March 2012. Reports for both can be sent via qrz.com.

The Maltese authorities have given permission for some amateurs to conduct experiments on the 500kHz band until the end of 2011. It is expected that the permits will be extended until after the 2012 WARC, when a decision on the hoped-for amateur allocation in the 500kHz area is to be made. The successful Maltese amateurs will get a 9H9 call entitling them to run 10W ERP between 501 and 504kHz. 9H1ES has already been heard across the island using an old 15 watt ART-13 transmitter on 502kHz and 9H1AV is setting up his station.



A nice capture of ZEVS from PA3CPM.

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

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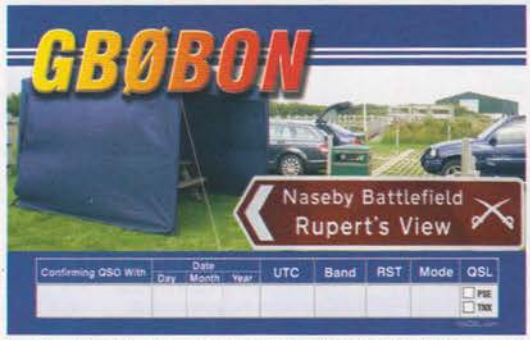
HF

A new entity and other news



Peter, G4XEX enjoyed operating both as GR4XEX and GB0BON during June (see text).

SUMMER CONDITIONS. Band conditions have been disappointing once again, perhaps not surprising during the summer period, though on 6m all continents have been worked recently (which will no doubt be covered in the VHF column). There has been some discussion on the CDXC reflector about whether we need to get used to working DX without sunspots – and what it will mean. Opinions on Cycle 24 still seem to be divided and in the popular press there have been articles of late talking, on the one hand, about possible power outages and other problems due to solar storms and, on the other hand, whether we are in for a long period of a quiet Sun (articles forecasting the latter have been around for a while; I recently ran across one that appeared in *New Scientist* some 5 years ago).

Maybe we'll get to the stage where expeditions are scheduled for the summer, to take advantage of multi-hop Sporadic-E (just as 6m expeditions already are), rather than waiting for non-existent F layer openings later in the year. That said, there will almost always be usable propagation on 20m and down and, as some are discovering, there can often be workable paths on the higher bands if you can launch signals at a low enough angle. This is relatively easy if you happen to live within a wavelength of the sea. For the rest of us it generally means an excellent vertical array (ie with a very good ground radial system) or a very high antenna. Indeed, a high dipole may well outperform a lower multi-element array on those marginal low-angle paths. The other way to achieve a low takeoff angle is to take advantage of sloping ground, as was highlighted in G6XN's excellent writings (see, for example, HF *Antennas for All Locations*). Apropos of which, if you don't currently use a propagation prediction tool, it is worth looking at *VOACap Online*, which makes this excellent VOA professional tool available to anyone with web access.

Despite any doom and gloom about HF propagation, there are more and more quite significant expeditions being announced for the autumn, several of which start in September. I will be carrying details in next month's column. There have also been some news items about a Malpelo Island (HK0) effort early next year, one which will be very welcome as a big operation from there is long overdue. More news in due course.

SOUTHERN SUDAN. Since my last column there has been quite a bit of correspondence and press coverage related to Southern Sudan, both in the amateur radio context and more generally in the news media.

Southern Sudan was originally added to the DXCC list (along with a number of other 'entities' such as Sable Island and the UN building in New York) under a rule relating to 'separate administration'. Although Southern Sudan was still part of Sudan, by the end of what is now known as the First Sudanese Civil War in 1972, Southern Sudan was no longer under the control of the Khartoum government. The situation changed again in 1983 when SPLA/M (the Sudan People's Liberation Army) was formed and the Second Sudanese Civil War started, running for some 21 years. Back in January of this year a referendum in Southern Sudan resulted in an overwhelming vote for independence and a date, 9 July, was set. However, on 6 June armed conflict broke out in the border region and the independence process was thrown into turmoil (the border area has significant oil deposits, hence the interest). At the time of writing, though, 9 July seems still to be on the agenda, with the UN Security Council scheduled to vote on 13 July to allow the new Republic of South Sudan to join the UN in its own right, becoming the UN's 193rd member. Assuming this vote goes in favour of South Sudan, the General Assembly will ratify it the following day and, within 48 hours, the ITU is expected to issue an international telephone dialling code and a prefix for radio callsigns (which, of course, will apply to both commercial and amateur callsigns, as per my item last month).

From an amateur radio point of view, the old DXCC entity of Southern Sudan was valid for contacts made between 7 May 1972 and 31 December 1994. A DXCC announcement in 1998 made it clear that, strictly, according to changes made to the DXCC '2000' rules (which came in at 2359 on 31 March 1998) the entity should have been deleted retrospectively from 1983 (see timeline above) but, as there had been accredited operations subsequent to that time, it was considered both unfair and impractical to do so, hence the 1994 date. That same revision of the rules made clear that, should such an entity come into being again at any time in the future, it would be added as a new one, rather than the previous entity reinstated. The necessary green light in this case is likely to be granting of UN membership. Once South Sudan is added to the DXCC list there are, as I mentioned last time, various amateur radio teams ready to fire up on the bands. Indeed, there are some well-known DX operators already in the country, working there as part of the UN presence.

While all rather complex and, perhaps, academic if all you are looking for is a new 'counter', the new government in South Sudan has apparently been very supportive of applications to operate amateur radio as any operations will bring attention to the new country and help it to establish itself in the world. While some may feel that amateur radio and politics should not mix, as long as we collect 'countries', albeit to a somewhat complex definition, such mixing is, to an extent, inevitable.

On a related note, I received an e-mail from John, G4GWJ taking strong exception to my publication of the image of the ST2FF/ST0 card in last month's column. He thought the image inappropriate, at least without further explanation. I am happy to expand, in case the red cross on the card was insufficient, to say that the text on the back of the card focused very much on the plight of the Southern Sudanese and drew attention to the work the Red Cross

was doing in the area, encouraging donations to that work (the operation concerned took place in 1980).

Personally, I value the way in which DXing helps to increase our awareness of what is happening around the world, as well as, hopefully, contributing in some small way to international relations. As far as the history and background above are concerned, I want to acknowledge Wikipedia, on which I have drawn heavily, in addition to various amateur radio sources.

ETHIOPIA. ET3AA is back on the air with the reopening of the EARS club station on 30 May. Professor Heiko Schroeder, head of the technical faculty of the University of Addis Ababa and Hans Blondeel Timmerman, PB2T, President of IARU Region 1, cut the ribbon in a reopening ceremony. Donations from STARS and others helped make it possible. Sid, ET3SID, led the antenna work and installation on the roof of the building. A 'dream beam', a 17-element 6-30MHz log periodic that was once on a foreign embassy in the city was saved from the scrap metal dealers and reinstalled at ET3AA. Twenty-five ham club members were expected to take the licence exam in late July. The opening of the ham club station was announced on national television, which resulted in many additional club membership applications. Ethiopia is, incidentally, an excellent case study in how amateur radio can prosper in developing countries. Much of the success is down to Sid (a British national married to an Ethiopian, who is now retired from his work at the technical college, but stays on in a voluntary capacity), who has worked tirelessly to promote the hobby as being complementary to the theoretical side of the students' studies. The RSGB has supported his efforts by discounting the cost of the International Amateur Radio Exam (which was brought in when City & Guilds no longer offered a suitable qualification) for his students – the YASME Foundation meeting the rest of the cost.

OTHER DX NEWS. There have been a couple of Market Reef (OJ0) operations recently, but if you missed them there is another chance this month when Dervin, PD9DX, Marc, ON8AK and Max, ON5UR, will be active as OJ0UR between 13 and 20 August. Market Reef qualifies for a wide range of amateur radio awards – IOTA EU-053, ARLHS MAR-001, TWLHD WLH OJ0-001, WLOTA LH-0542 and Admiralty C4472. No, I don't know what half those are either! QSL via M0URX.

EA3QS, IZ4AKS, IW3SQY, IZ8GCE and IT9YVO will operate as TY1KS from Benin from 5 to 14 August, all bands, with three Elecraft K3s and two Elecraft KPA500 solid-state amplifiers. They will focus on the lower bands and digital modes due to the high demand for those from Benin. They will also be on SSB on the higher bands, especially during trans-equatorial propagation openings. QSL via IZ8IYX or OQRS or LoTW.

CONGRATULATIONS. Both Nigel, G3TXF and Tim, M0URX were recognised at the recent Friedrichshafen Hamfest for their excellent QSLing record. Nigel wasn't at Friedrichshafen, though. For the last week of June he was in St Helena, handing out CW contacts to the deserving. The statistics I have seen suggest that he made some 11,229 contacts in 8 days of operation. 23 UK stations managed contacts with him on all 8 bands on which he was active (he didn't get on to 160m). His experienced ears always seem to be able to select UK callers from even the most rowdy pile-up. A superb effort, as always.

CORRESPONDENCE AND TABLES. Steve, G4AZB returned to the HF bands early last year after many years of inactivity and sends in a first report. 20 produced YB0DJ, VP8LP, N3NEP and J6/VE3CZF/P, 17 gave JA1OJJ and VP8LP (Falklands) while 15 accounted for XU7SSB, RV9YP, YB0LTH, HS0ZIN, YV5HNJ and UN7TO, all SSB. In addition, operating /M from St Mary's Lighthouse gave XU7DDD on 15 and FR1GZ (Reunion) on 10.

Dave, M0BVE mentions EG9LP (Ceuta & Melilla) on 17, JW8HGA, SU9VB, HK3CQ and FP5AA on 20, PJ4A, KP2/AA1TR and NP4G on 30, plus PJ2/W8QID on 40, all CW. Ron, G4DXW worked (all SSB I believe), VP5/W5CW, YN2GA, CE1VGT, JY6ZZ and 9Z4AM (Trinidad & Tobago) on 17, plus 5N7M and IS0BOZ on 12.

Graeme, G6CSY continues to focus mainly on the digital modes and had an unexpected 20m RTTY contact with VK3TDX for a new IOTA, while QRP CW gave all-time-new DXCCs with JT5DX and PJ4LS on 20. S&P (Search & Pounce) around the bands gave contacts with F5JNE/P on EU-048 on 30 CW, F/DL4PU on EU-070 on 40 Feld-Hell and MS0INT on EU-059 on 40 CW. After 96 JT65A contacts on HF, the DXCC count is up to 29 with 20 states and 30 counties worked. Farthest west so far has been K5WW in Texas. He says, "Either side of our sunrise on 7.076MHz USB is the place to listen". He also mentions JM1XCW, FM5CD and FY5LH on 20 running 75bd RTTY, with FY5LH later on 40 running 'normal' RTTY, as well as saying "WARC best-DX EVER goes to a 30m RTTY QSO with ZL3OMDG in the early hours of the morning, here using QRP and just a wire". Graeme recommends the DigiFest contest as a good opportunity to try working DX on some of the less commonly heard digital modes. His best DX so far has been LU5FF on 15 BPSK63, 20 MFSK16 and 20 BPSK63. Other contacts have included Feld-Hell and 250/4 Olivia. Main software being used is *MultiPSK* and *MixW*.

2011 TABLE

(starting 1/1/11, WARC bands and all-band)

Call	30m	17m	12m	ALL
G3HQT	147	126	39	
G4DXW	0	69	21	
MU0FAL	65	54	69	142
G4XEX	28	38	19	88
G3SED	17	16	40	
M0VKY	0	15	1	164
G4FVK	4	12	1	75
G6CSY	26	9	2	29
M0BVE	0	0	0	131

Peter, G3HQT says he "managed to salvage a few contacts from under the summer QRN". These included 8N6RL (Okinawa), CX7CO and YS3CW on 30 CW, V5/HB9BXE, V85SS, 9J2RI and 5X1VJ on 17 CW, TI2UNA and TJ3AY on 17 PSK, A45XR on 17 RTTY and CE2/VE7SV on 12 CW.

Finally, Peter, G4XEX took advantage of the GR prefix to have some fun on the bands and worked almost 600 stations, all on BPSK31. Aside from that, he managed to put the following in his log: HI8CSS, CU3HN, CU7AJ, OY1R, WP3EFand PY3ED on 20, 4X1SK and A61BK on 15, plus EK5KE on 10, all BPSK31. He enjoyed the Sporadic-E propagation in June, which even produced some short skip on 20m at times. Peter was also involved in running GB0BON (Battle of Naseby) this month. They set up a portable operation in a car park overlooking the Battle Field. This year, though, they got permission to use the flag pole in the corner of the car park to mount the G5RV antenna which, at 40ft at the centre, worked well. Peter comments that some 80% of his recent DX has been in answer to CQ calls. Maybe DX stations are getting tired of the huge pile-ups that can result from a Cluster spot and are starting to prefer calling stations with a view to a bit more of a chat. If so, it's something we should probably welcome. While DXpeditioners generally go to a DX location because they enjoy running a pile-up, the residents of semi-rare locations such as Guernsey, Jersey, the various Caribbean islands, etc often get cheesed off that they can't go on the bands and have some casual conversations without being continually interrupted by callers wanting to collect a quick contact.

WEBSEARCH

M0URX QSL request:
www.m0urx.com/qsl-request-form
OJ0UR: www.united-radio.be/index.html
TY1KS: www.dxcoffee.com/ty1ks
VOACap Online: www.voacap.com/prediction.html

VHF/UHF

More Sporadic-E propagation openings on the 50, 70 and 144MHz bands

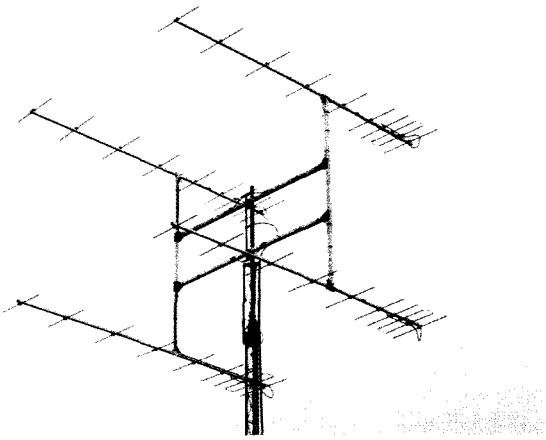


PHOTO 1: The 144MHz antenna system at the QTH of Peter Weatherall, G3MLO: 4 x 9-element G0KSC LFA Yagis.

PROPAGATION EVENTS. Sporadic-E (Es) openings on the 50MHz band were reported every day throughout the month with the exception of 7 June. However it did appear that many of the European openings were of poorer quality in terms of intensity and duration compared to previous years. What was surprising though was the number of 50MHz transatlantic openings to North and South America, with such events occurring on 25 days during June. Some of the countries contacted from the UK included Antigua (V25), Aruba (P4), Bonaire (PJ4), Brazil (PY), Canada (VE), Curacao (PJ2), Dominican Republic (HI), French Saint Martin (FS), Guadeloupe (FG), Honduras (HR9), Martinique (FM), Mexico (XE), Puerto Rico (KP4), Saint Kitts and Nevis (V44), Saba (PJ6), Sint Maarten (PJ7), Trinidad and Tobago (9Y), United States (W) and Venezuela (YV). To add a bit of spice to the mix there were also two days when the band opened up to the Far East into China (BA), Hong Kong (VS6), Japan (JA) and the Philippines (DU). I'll be taking at look at these openings and other 50MHz activity next month.

Es openings were also reported on the 70MHz band with 21 days during June when openings occurred. Not all were particularly strong but at this frequency they do create some excitement for DX operators. Three Es events also reached as high as the 144MHz band but the general consensus amongst many seasoned operators was that the number of openings on this band was considerably reduced compared to previous years.

THE 70MHz BAND. As well as being a great 'natter' band, the 70MHz band can sometimes exhibit enhanced propagation and, fortunately, many countries with permanent or temporary allocations are located at an ideal distance from the UK for a number of modes that include Sporadic-E, aurora and meteor scatter. Tropospheric ducting or scattering is not as common as you will experience on the 144MHz and 432MHz bands so don't expect to hear the nearer European countries all the time, if at all. Assuming you are using a Yagi antenna you will normally work around the UK, up to 300km or so, with some degree of certainty. However to work longer distances you will have to use some other propagation mode and Es during the summer months is the DXers weapon of choice. There is one slight snag though as there are still a number of wideband FM broadcast stations operating in the 65.8-74MHz OIRT band within eastern Europe and, when the band opens up, the interference levels can sometimes be overwhelming.

As with the other VHF bands, far greater range can be achieved by switching from omnidirectional vertical aerials to horizontal beam antennas. Many stations are now active on the 70MHz band; some of them operate on FM and can be worked on converted private mobile radio (PMR) sets. You may think that all FM operation must be vertically polarised but there is no reason why this should be so. Indeed, you are more likely to hear long-distance FM activity on 4m rather than on the 6m band. If you want a further improvement in range, this can be achieved by using narrowband modes such as CW and SSB – and there are many DX stations active using those modes.

Knowing where to find the DX stations can be a bit of a problem on the 70MHz band as many European countries have different allocations from the 500kHz we have in the UK. For example, Belgian stations can only operate on 69.950MHz, Finnish stations may be found below 70.175MHz and Norwegian stations can often be heard between 70.138-70.187MHz. The situation regarding international allocations within the 70MHz band is somewhat fluid, with both permanent and temporary authorisations. So, to keep up to date with recent developments, take a look at www.70mhz.org. This website, maintained by GM4AFF, G4ASR and OZ2M, has up to date details of international allocations, band plans, beacons, contests, equipment and station reports.

There were 21 days during June when Es propagation enabled DX contacts to be made throughout Europe. On 1 June there was a small opening to the Canary Islands (Africa) with EA8YT (IM18) working stations in England at distances approaching 3000km. A lengthy opening on 10 June between 1000-2100UTC enabled many stations between Scotland (Shetland Islands, IO99) and the south coast of England (Isle of Wight, IO90) to make contacts with stations in Belgium (ON), Faroe Islands (OY), Denmark (OZ), Finland (OH), Norway (LA), Estonia (ES), Czech Republic (OK), Slovakia (OM), Romania (YO), Croatia (9A), Slovenia (S5), Balearic Islands (EA6), Spain (EA) and Portugal (CT). Some of the stations included CT1FFU, EA1YV, EA6VQ, ES1CW, LA6MV, OH6PA, OK1KT, OM5KM, ON7GB, OY9JD, OZ8ZS, S51DI, YO2IS and 9A6Z.

Other DX contacts reported during June included the 70MHz stations of TF/DL3GCS (Iceland, HP93), LX2LA (Luxembourg, JN39), SV1DH (Greece, KM18) plus short-skip and backscatter Es between all UK regions and Ireland (EI).

Gary Tuppeny, G4LOE (West Midlands, IO92) is active on the 70MHz band, running 30W of SSB into a vertical dipole. His contacts during an opening on 10 June included the stations of ES1II/8 (KO18), ES2JL (KO29), ES3RF (KO29), IK6FBB (JN62), LA9DL (JO59) and OH1LEU (KP01). Other contacts in the month included EC4TR (IN80) on 27 June and OH2NAF (KP20) on 28 June. Gary comments how interesting it was to see that the location of the Es clouds frequently coincided with severe thunderstorm activity in the same vicinity.

John Lemay, G4ZTR (Essex, JO01) mentions that while the Es propagation has generally been disappointing, there have also been some very good openings. On 27 June he picked up 4 new locator squares when he contacted the stations of YO2IS (KN05), YO4FYQ (KN44), YO5PBG (KN17) and YO9IE (KN34). In other openings on 28 June he worked OH1XT (KP01), OH2NAF (KP20), OH6PA (KP02) and OH8UV (KP34) in the morning and EA5/G3XGS (IM98) in an opening during the afternoon.

Dave Court, A92IO writes that Bahrain now has an allocation from 69.900-70.400MHz with a maximum power of 500W. Already two firsts have been worked from Bahrain (A92IO) to the Czech Republic

(OK1KT) and Slovakia (OM3PV). The contacts were made on 3 June at 0812 and 0828UTC respectively. Frustratingly, the band was open from the UK at the same time to Greece and Romania but no link to the Middle East was apparent.

In a newsletter from the Icelandic Radio Amateur society (IRA), Jónas Bjarnason, TF2JB mentions that Iceland will continue with its allocation on 4m until 31 December 2012. Their band is 70.000-70.200MHz with a power limit of 100W, granted on a secondary basis. This is good news as Keith Tatnall, G4ODA and Paul Bradfield, G1GSN will be active from Iceland on the 50MHz, 70MHz and 144MHz bands around the peak of the Perseids meteor shower in August. The main transceiver will be an Elecraft K3 that will provide 100W on 50MHz into a 3-element Yagi. The K3 will also drive a G3WPO design 70MHz transverter into a solid state amplifier and 4-element Yagi. A spare K2 transceiver, 70MHz transverter and 2C39 amplifier will also be available just in case. On 144MHz the K3 will drive a transverter and 3CX800 amplifier fed into a 12-element M2 Yagi. In August it is not expected there will be any significant Es propagation so most activity will be via meteor scatter. On 4m the frequency will be 70.175MHz and TF/G4ODA will always transmit during the first period one minute period using JT6M digital transmissions. Further details may be found at the website of the Five Bells Contest Group, www.g4siv.com.

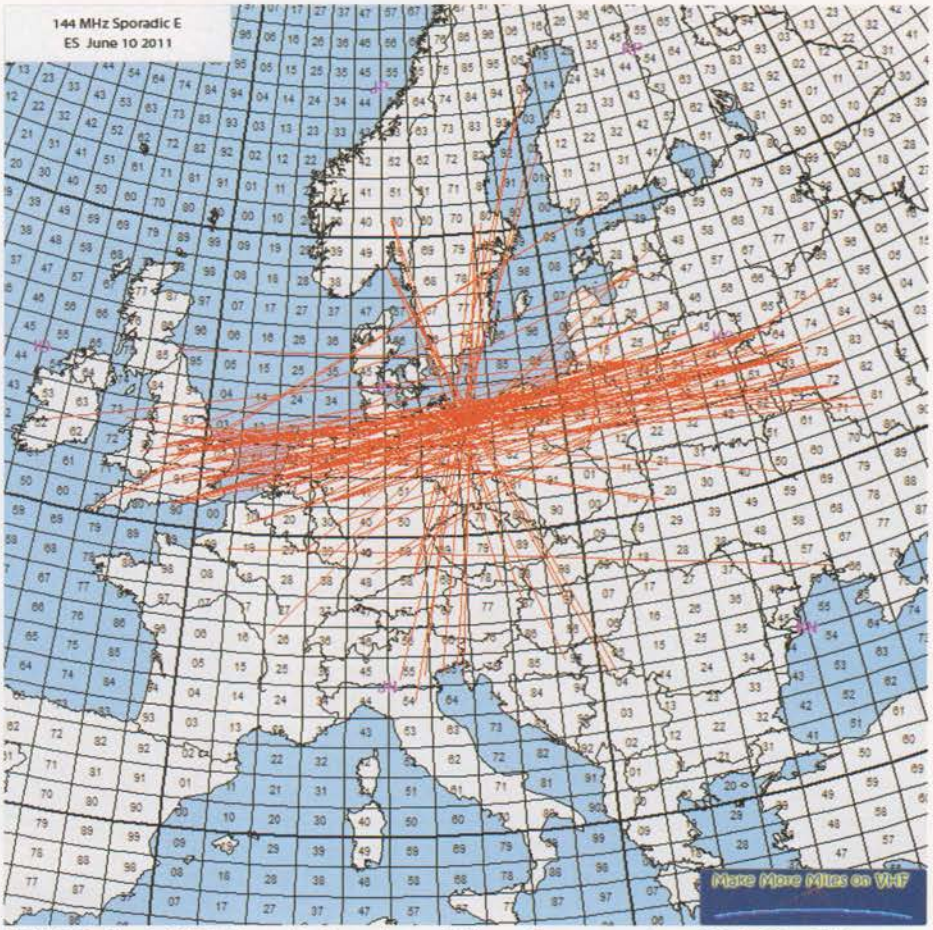


FIGURE 1: The 144MHz Sporadic-E opening on 10 June. Diagram courtesy of Make More Miles on VHF, www.mmmonvhf.de.

THE 144MHz BAND. Sporadic-E openings on the 144MHz band occurred in the UK on 3, 10 and 17 June, but this is a very low number compared to previous years. 11 days of openings were reported in 2010, 11 in 2009 and 12 in 2007. However 2008 was also a poor year, with only 4 days of openings being recorded. Whether this is a genuine decline in Es propagation or just the normal variability of this type of propagation we shall have to wait and see. Although it didn't reach the UK, one of the furthest Es contacts occurred on 2 June between the stations of YT3I (Serbia, KN05) and EB8BRZ (Balearic Islands, IL27) over a path of 3717km.

There were two openings in the UK on 3 June, one in the morning to the Canary Islands (EA8) and one in the afternoon to Greece (SV) and Italy (I). The morning event occurred between 1000-1040UTC and favoured stations located in Cornwall although other stations in southern England also reported making brief contacts into south-eastern Europe.

Tim Fern, G4LOH (Cornwall, IO70) was pretty much in the thick of it during the morning opening, managing to make SSB contacts with EA8AVI (IL28) at 2600km, EA8TJ (IL18) at 2601km and EA8CTK (IL18) at 2618km distant. Tim also heard the ED8ZAA beacon (144.485MHz) and made a contact with YO4RYU/MM, presumably via tropo, as the distance to the 'wet' square was only 715km.

The afternoon opening, between 1530-1615UTC was much more extensive with stations in central England and Wales making some good long-distance contacts. Francesco Summo, IZ7QVD (Italy, JN81) running 25W from a Kenwood TR-9130 transceiver mentioned making SSB contacts between 1542-1549UTC with the stations of G3WZT, G4ASR for best DX at 1906km, G4KWQ, G4PBP, G6HIE, G8HGN and G8VYK.

I missed the first 20 minutes or so of the Es event but managed to work IZ7BPC (JN81), IZ7LMX (JN80), IZ7QVD (JN81) and IK7UXY (JN90). Right at the end of the opening I heard SV8KGE (Greece, KM08) calling CQ but only peaking around the S1 level. Nevertheless I quickly worked him for a nice SSB contact some 2341km distant. Remember the old adage: if all the DX you are working is S9 then you're not working the real DX!

Paul Pasquet, G4RRA (Devon, IO80) surprised me when he reported that his contact with SW6KRV (KM09) was only the second time he had worked into Greece on the 144MHz band. Running 400W into a 10-element Yagi he also reports working IK7LMV over a 1974km path.

Dave Edwards, G7RAU (Isle of Wight, IO90) seemed to be in an optimum position for making contacts into Greece as he managed to work SW6KRV twice at 1539 and at 1550UTC, SW6KRW (KM09) in a separate location from the previous station and SV8GKE at 2174km distant. Running 400W into a 12-element Yagi he also contacted IK7UXY and IK7LMX, but mentioned that too many stations were all calling at the same time on 144.300MHz and that it was very chaotic. During the morning opening Dave was pleased to work the station of EA8AVI (IL28) at 2786km and reports that he also heard EA8TJ (IL18) and the CS3BTM beacon. Interestingly the beacon on the island of Madeira (IM12) only runs 1W into a 3-element Yagi, yet was heard peaking 559 at a distance not far short of 2400km.

After some days of rest the 144MHz band opened up again on 10 June, this time with a reflection point over northern Germany. The diagram, **Figure 1**, shows the Es paths that were available, the majority being from central and southern England into Russia. It is interesting to note that stations in Scandinavia could also make contacts into Italy and Serbia by utilising the central reflection point, although in this instance it didn't appear as efficient as the East-West path.

Ivan Shor, RA3WDK (Russia, KO81) runs high power into a 13-element DL6WU Yagi and reports that he made 27 contacts between 1613-1650UTC with stations in England, Germany and the Netherlands.

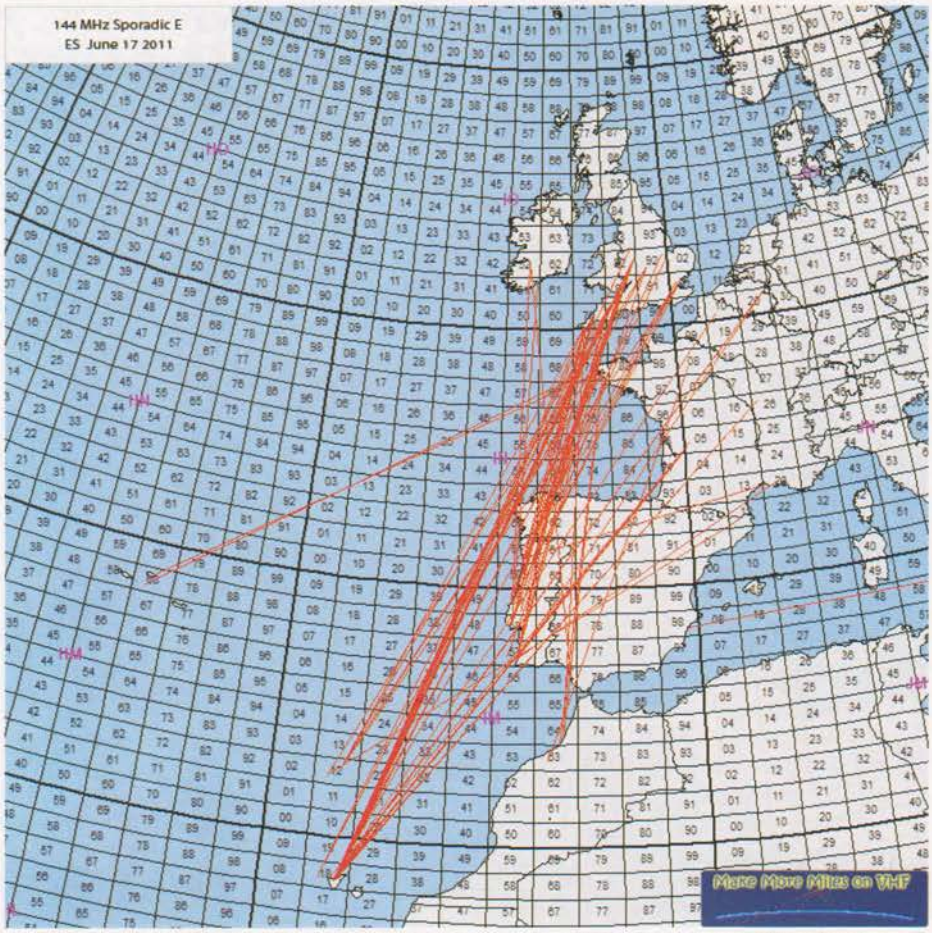


FIGURE 2: The 144MHz Sporadic-E opening on 17 June. Diagram courtesy of Make More Miles on VHF, www.mmmonvhf.de.

His UK contacts, all over 1950km distant, included the SSB stations of G3LQR (JO02), G3YDY (JO01), G4BEL (JO02), G4CLA (IO92), G4EAT (JO01), G4RGK (IO91), G4SWX (JO02), G4ZFJ (JO01), G4ZTR (JO01), G6HKS (IO92), G8GXP (IO93) and G4PBP (IO82) for best DX at 2580km.

The best location in the UK for this Es opening was clearly in eastern England (Norfolk, Suffolk, Essex and Kent) with those further west making very occasional contacts. John Regnault, G4SWX (Suffolk, JO02) mentions that he heard the station of UA3WM (Russia, KO72) peaking 59+ for around 30 minutes. He then went on to work EW1AA (Belarus, KO32), LY2BAW (Lithuania, KO25), RA3LBW (KO64), RA3WDK (KO81), RV3YM (KO63), UA3YBW (KO53) and UA3YCV (KO62). Colin Roberts, G4ZFJ (Essex, JO01) reports that between 1628-1653UTC he also contacted EW6BA (KO55), LY2BAW, RA3LBK, RA3LBW, RA3WDK, RV3YM, RW1XR (KO73), UA3WM and UA3YBW.

It was frustrating to hear operators to the east of my QTH in Herefordshire (IO81) working many Russian stations. You literally had to wait for a signal to pop out of the noise for a few tens of seconds before a quick contact could be made. My contacts made between 1640-1720UTC included the stations of SP4MPH (Poland, KO14) at 1738km, LY2BAW at 1858km, RV3YM at 2421km and UA3WM for best DX at 2584km. Just over the mountains from my location, the stations of GW7SMV and GW8JLY both reported working RV3YM around 2455km away, but very little else.

The next Es opening on the 144MHz band was reported in the evening of 17 June, between 1725-2005UTC. It was a long event with a refection point somewhere over the Bay of Biscay, as can be seen in the diagram, **Figure 2**. Most contacts were made from the UK into the Canary Islands (EA8) but well situated stations in Belgium (ON) and the Netherlands (PA) also managed to work into these islands located off the north-west coast of mainland Africa. Some stations in south-west England also managed to find a path into Morocco (CN) and others found propagation into Portugal (CN).

The Welsh stations had a bit more luck making some long distance SSB contacts during this opening. Jamie Ashford, GW7SMV (Gwent IO81) running an Icom IC-910H transceiver and 12-element M2 Yagi contacted the SSB stations of CT1DIZ (IM57), CT1FFU (IM59), CT1HZE (IM57), EA8YT (IL18) at 2798km, EA8TJ (IL18) at 2814km and EA8TX (IL18) for best DX of the opening at 2817km. Lyndon Leach, GW8JLY (Glamorgan, IO81) using a Kenwood TS-2000 transceiver, 350W amplifier and a 9-element worked exactly the same stations, his longest distance contact being EA8TX at 2806km. Lyn mentions that he also heard the ED7ZAA (IL18) and CS3BTM (IM12) beacons for the first time during this event.

Pinto Barbosa, CT1ANO (Portugal, IN51) reports that he uses a Kenwood TS-2000 transceiver, a 4CX250B amplifier and 16-element I0JXX Yagi and managed to work the stations of G0CUZ (IO82), G4CZP (IO90), G4DHF (IO92), G4EAT (JO01), G4FUF (JO01), G4KIY (IO92) and M5BFL (IO91).

David Johnson, G4DHF (Lincolnshire, IO92) passes on the information that he is using a Kenwood TS-950S transceiver interfaced with an SDR-IQ receiver used as a tracking panoramic adapter. This software defined radio offers a broad range of spectrum analyser and demodulation capabilities. It supports CW, USB, LSB and FM as well as many others modes and has fully adjustable DSP filter bandwidths. Running 200W into a 17-element Yagi, his contacts included CT1ANO, CT1FFU and EA8TX. David mentions that the 3037km contact with EA8TX may not have been possible without the ability to spot him operating further down the band on 144.260MHz. Although the signals were in and out of the noise, the SDR-IQ receiver coupled to the IF unit of the TS-950 enabled the signals to be immediately seen on the laptop display.

Tim, G4LOH mentioned that Es propagation was very poor during June and that it was one of the worst seasons that he can remember. He was pleased however to catch the opening on 17 June as the 144MHz band opened up twice at his QTH. The first opening between 1735-1828UTC bagged him SSB contacts with the stations of CT1DIZ, CT1EAT, CT1FFU, CT1HZE, CS7/PD0HNL, EA8CTK, EA8TJ, EA8TX and EA8YT. The second opening between 1925-2000UTC was much more interesting as it was to stations located in Morocco. Most of the contacts were made on the simplex FM channel S20 (V40) 145.500MHz and these included the stations of CN8SG/M, CN8LI, CN8MMZ, CN8OLA, CN8SSB and CN8TX. If the opening is lengthy it is always worthwhile taking a listen on the FM channels to see who can be worked. The results can sometimes be quite surprising. Next month I'll be giving details of an extraordinary 144MHz Es contact made on 1 July between G7RAU and 4X1GA (Israel). The Israeli station was also heard at the QTH of GW7SMV some 3765km distant!

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

GHz Bands

Contest activity and a new 24GHz transverter

PHOTO 1: The new 24GHz transverter.The 20dB gain horn seen here is used for short range tests whilst a 30cm Cassegrain dish is available for long distance contacts. The FT-817 IF radio mounts on the top of the transverter with a simple webbing strap.

1296MHz OFF THE MOON. Last month I mentioned that the DUBUS / REF 23cm (1296MHz) EME contest was to be run over the first weekend of June. This turned out to be one of the best-supported EME contests I can remember. At one stage I was able to see 25 different stations active between 1296.000 and 1296.050MHz, using the waterfall display of *Spectravue* [1] on my SDR-IQ. It really did look like 20m at times! This, remember, was using a small 2.3m diameter dish. I suspect that with a more typical 3 or 4m dish, many more stations would have been visible on the display.

Doug, VK3UM, worked 51 stations over the two days of the contest (4 and 5 June). His tally included six Japanese, six North American, three Australian with the remainder all European. This gives some idea of just how popular 23cm EME is in Europe compared with other parts of the world. It still surprises me how little North American activity there is currently. This is in complete contrast to just a few years ago. European 23cm EME activity continues to grow strongly.

Possibly the biggest signal on the band comes from the 9.7m ex-commercial dish used by the DL0SHF group. Their signal is often the first heard by many taking their first steps into 23cm EME. Carsten, DL6LAU, reports they worked 47 stations in 4.5 hours on the Saturday and a further 23 on the Sunday in another four hours of operating. Per, DK7LJ, is the owner of DL0SHF.

One of the highlights of the contest was the participation by LY/DL1YMK. Yes, they were in Lithuania. The intrepid pair reported working 92 stations on 23cm during their expedition to LY. It is not clear how many of the 92 stations were worked during the contest and how many on the two other days of operation. I'm pleased to say that I was one of the lucky 92 on 23cm and I also worked them on 13cm EME for two new DXCC entities.

Michael and Monika reported poor mains voltage regulation at their location, with mains down to 180 volts at times. Their signal was noticeably weaker on 23cm, this time, compared to previous expeditions.

ACTIVITY DURING THE LOW BANDS CONTEST. At the same time as the EME contest on 5 June, the UK Microwave Group Low Bands Contest was also under way. This contest covers 23, 13 and 9cm.

I think that Martyn, G3UKV, summed up the contest very well by reporting "tough going". Although the east of the UK was dry all day, much of the rest of the UK had heavy rain. That made it difficult for the portable stations and even the fixed stations suffered from detuning of their wet antennas.

The Telford group also suffered from low supply voltage problems. In this case it was due to excessive voltage drop in the supply leads from their battery. This caused them to become (in Martyn's words) "frequency agile". In spite of the conditions the G3ZME/P group seemed to enjoy the contest.

Bob, G8DTF, worked the Telford group during the contest. His contact on 9cm with them was completed in spite of the unwanted FMing on the received signal. Surprisingly, the path did not work on 13cm.

SPAIN ON 10GHz AND 5.7GHz. Further to the south Ralph, G4ALY, had a better time. He worked EB1RL/P (IN83FD) at 813km on CW on Saturday 4 June. The 10GHz contact was completed first and then Ralph had to wait until a little later for the Spanish station to QSY to 5.7GHz for a successful contact on that band. Ralph had previously worked this far on both of these bands, but subsequently there was some doubt raised over the legitimacy of the Spanish operation at that time.

THUNDER AND LIGHTNING ON 1.3 AND 10GHz. Back in the June column I mentioned some observations made by Nick, DL/GM4OGI, on long distance reception of the GB3MHL and GB3MHX beacons, at Martlesham in the UK, from his location near Cologne, Germany. Nick has been very busy at work recently, so was not able to do a lot more observing during the early part of the storm season. However, he recently provided some further information from the 16 June storms.

Nick caught a very heavy rainstorm on the 16th with a small amount of lightning. His plot of GB3MHL received on 23cm had insufficient contrast to reproduce well in the magazine. However, examining the plot it shows some spectral spreading caused by the scatter coupled with possibly refraction due circulation of the air through the rain cell. The rain storm was coming in from the north-west. Tracking actually started to be possible when the cell was over the Netherlands.

Checking 10GHz, looking for evidence of scatter on GB3MHX, revealed nothing at all. Whilst this doesn't of itself prove anything, Nick thought that it may be that the storm cell was higher than about 2.5° above his horizon and hence a little close for these long distance observations. I hope to include a high contrast plot in one of the next columns. Nick says he needs to work out how to remotely

FORTHCOMING MICROWAVE EVENTS 2011/2012

Rutherford Appleton Labs Microwave Round Table, 21 August. Details: G0MJW

Weinheim, 10-11 September. Details: www.ukw-tagung.de

Crawley Microwave Round Table, 11 September. No details available at present

Microwave Update, Enfield, Connecticut, USA, 13-16 October 2011. Details: Bruce Wood, N2LIV, n2liv@arrl.net

15th International EME Conference, Cambridge, UK, 16-19 August 2012. Details: www.eme2012.com

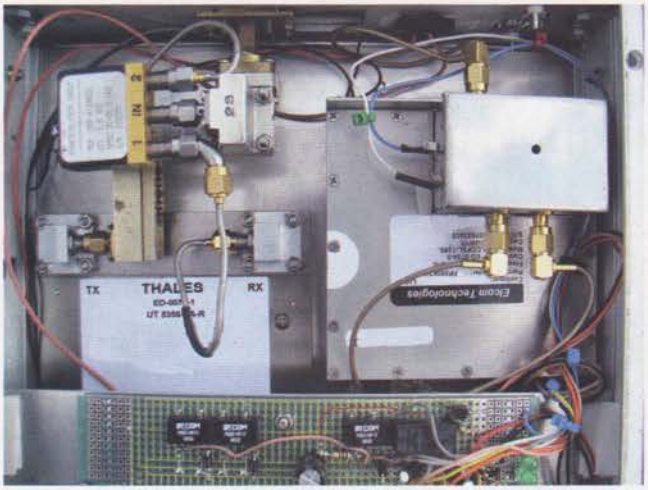


PHOTO 2: Inside the 24GHz transverter. The Elcom synthesiser and Thales transverter units are in the centre. A Dynatech SMA3.5 relay provides the low-loss antenna changeover connection.

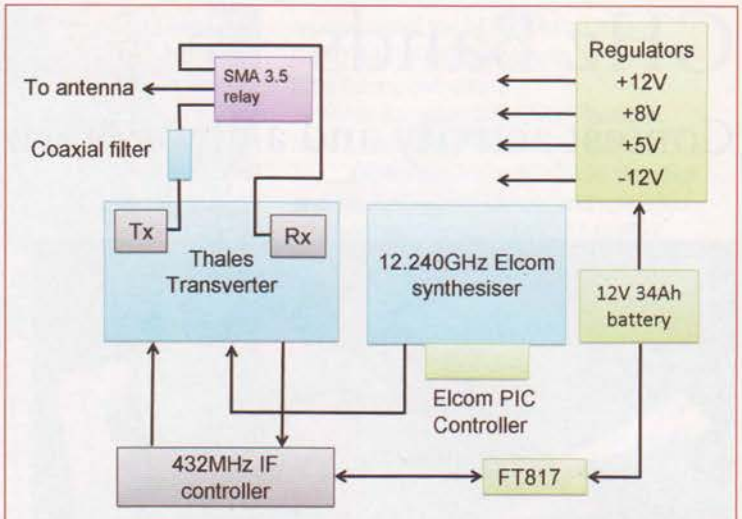


FIGURE 1: Block schematic of the 24GHz transverter.

point his 10GHz dish in elevation as well as azimuth (his next project). At the same time he was able to check local beacons DB0GW in Duisburg and ON0GHZ near Brussels. They were both showing strong scatter even though he was pointing the dish at Martlesham. There was nothing from GB3SEE although reception is severely restricted to CW mode only due to the proximity of DB0GW, which is between 100Hz and 300Hz higher in frequency, at 10368.850MHz.

Interestingly, Nick says "the great advantage is that I know the frequency of GB3MHX and will be experimenting on some long time integration (at the expense of losing aircraft glint). Once you put JT4G in place that will reduce the possibilities... the price of progress". An interesting observation on digital modes on beacons from someone doing serious observations!

24GHz TRANSVERTER. Thanks to John, G4BAO, and Roger, G8CUB, I was able to get back onto 24GHz with a new transverter after my old mast head transverter failed several years ago.

I have built the new transverter around a Thales transverter 'head' and an Elcom 12GHz synthesiser. These units have been described on John and Roger's web pages, **[2]** and **[3]**. My new unit, which is shown in **Photo 1**, is a portable, tripod mounted system with a Yaesu FT-817 used as the 70cm IF. Note that this transverter uses reverse tuning due to the high-side LO injection. In practice this causes few problems and is a simple solution to the problem of high spurious levels when using low-side injection with these particular Thales units.

There is nothing really new about my own implementation of the transverter except that I chose to build it into a case from a defunct Racal Dana instrument. These are ideal for housing portable transverters and non-working units are available at radio rallies for just a few pounds. By removing the main PCB and mains power unit from an old Racal Dana AC millivoltmeter it became possible to slide in a new base plate on which to mount the synthesiser and transverter. The cast rear panel is solid enough to mount a bulkhead waveguide 20 (WG20) adapter, onto which a small dish or larger horn can be screwed. A second row of slots, meant for another PCB, forms a convenient mount for a separate power supply board.

My transverter uses a surplus Thales transceiver unit, bought on eBay. This is the RF part of an original Ka band commercial link equipment and comprises of a single compact block with local oscillator frequency doubler from 12.240GHz to 24.480GHz, dual mixers (one for transmit and one for receive) and two amplifier chains, one each for transmit and receive. The 24GHz RF input and outputs are in WG20. SMA coaxial connections are used for the receive and transmit IFs plus the 12GHz local oscillator input. I wanted to use a coaxial antenna changeover, to reduce the requirements for lots of ungainly WG20 in the rather restricted space available, so I used WG20 to coaxial adapters at the Thales transmit and receive ports.

The Thales power supply requirements are +5V, +8V and -12V. Applying +8V enables the transmitter, whilst the receiver section requires just the +5 and -12V supplies. The Elcom synthesiser requires +8V and +12V.

At present the Elcom synthesiser uses its own internal 10MHz TXCO. That will be changed in due course to allow the use of an external high stability 10MHz reference frequency.

Antenna changeover is by means of an SMA3.5 relay. This particular unit requires just 3.5V and was probably used as part of a GPIB RF switching matrix. In order not to have to provide yet another operating voltage the relay is connected via a 10Ω resistor, on the supply side of the main transmit/receive relay contact, to the main +5V transverter supply. A 1000μF capacitor is connected from the changeover contact to ground. During receive the capacitor charges to +5V through the 10Ω resistor. On transmit the capacitor is connected across the SMA antenna relay, allowing it to operate very positively. Once the capacitor discharges through the SMA relay coil, the relay is held operated by a smaller maintaining current through the 10Ω resistor. This saves precious portable battery current on transmit.

It was found necessary to use a 2 pole coaxial filter between the transmitter output and the antenna changeover relay as the (24480 + 432 = 24912MHz) output is otherwise only 16dBc below the wanted 24048MHz transmit signal at the Thales transverter transmit WG output. On receive the only effect of not having the filter is to very slightly increase the system noise figure due to some image band noise from the transverter RF stages. No interfering signals have been heard from commercial equipment operating at 24912MHz.

Photo 2 shows the inside of the completed transverter.

Power for the transverter is drawn from a 34Ah sealed lead acid battery that also powers the FT-817.

The main 24GHz antenna is a 30cm Cassegrain dish, although Photo 1 shows the transverter with a 20dB gain horn, suitable for things like checking the local beacon.

I usually mount the transverter on a reasonably sturdy ex-laser level tripod. The original level clamp is used to grip a short aluminium tube bolted underneath the transverter case. Alternatively, the plastic feet of the original case extend below the aluminium tube so that the transverter can be stood on a car roof or a small table.

Figure 1 is a schematic of the complete transverter showing the main building blocks.

WEBSEARCH

[1] *Spectravue* – www.moetronix.com/spectravue.htm
[2] G4BAO – www.G4BAO.com
[3] G8CUB – www.rfdesign.co.uk/microwave

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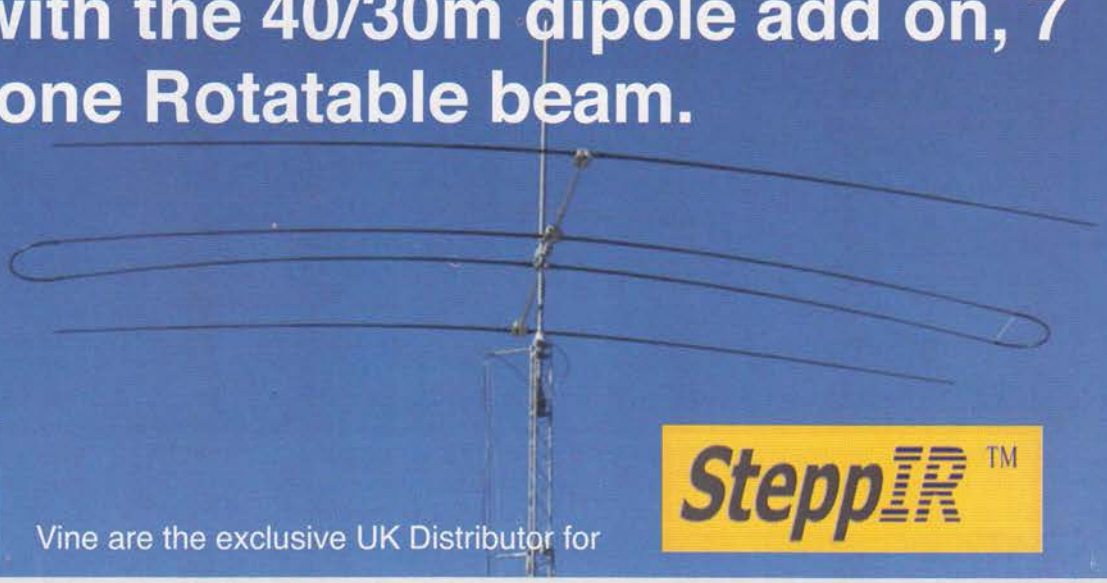

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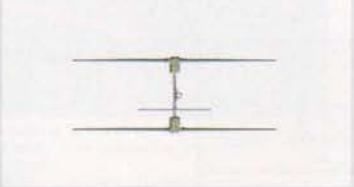
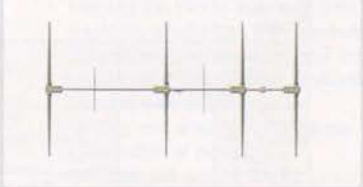
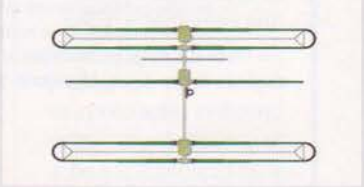
SDA-100 controller



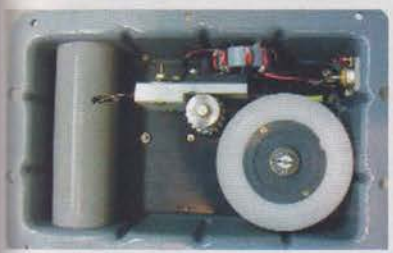
2el Yagi - 20-6m



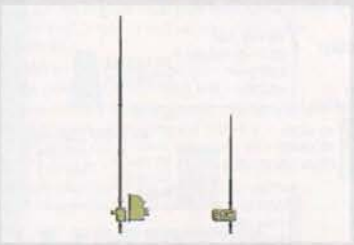
4el Yagi - 20-6m



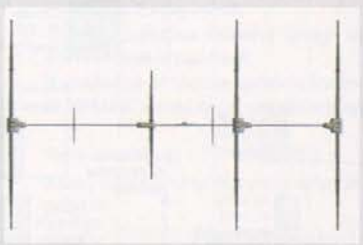
DB18 3el Yagi 40-6m



Motor box interior



BigIR 40-10m vertical + 80m coil



Monstir - 40-30 3el, 20-6m 4el

80m coil interior view

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Data

But it's not Real Amateur Radio, is it?

ATTENTION-GRABBER. I had to grab your attention somehow! If you don't normally read 'Data', this is aimed at you. Comments on various internet chat groups and the odd letter suggest there is real confusion in some people's minds over the use of computers with amateur radio. This (slightly paraphrased) letter is not untypical. "May I say that I am in complete agreement with the letter in *RadCom* [about remote operation]. Like him, I say a QSO in the amateur radio context is using radio equipment and an aerial in my back garden to whosoever's back garden, not sitting at a computer! I see people reporting that they have worked VK this and ZL that and I think they are doing well – then I read it is on PSK, whatever that is! I know you will say I'm ignorant of these fancy computer modes, well maybe I am; it's because I have no interest in them: I like traditional ham radio! I say, get off the internet and get on the air!!".

Oh dear! He is mixing up PSK31 (which is what most people mean when they just say 'PSK') with internet linking. A data mode is not really very different from sitting in front of your Morse key and bashing away with it. Your mind is generating letters and words; a piece of machinery is converting this into a signal to control a transmitter. That generates modulated RF that goes into your antenna and off into the æther. A data mode is no different. You decide what you want to say and type it into a computer. That generates audio signals, these go into your transmitter and so on... The important thing is that the transmitter IS in your shack and the antenna IS in your back yard. The computer is doing no more than generating signals to transmit. Many operators use a computer to generate Morse, rather than bashing it out on a semi-automatic or, even worse, a manual key. BUT – and this is the significant part – *many narrowband data modes have proved themselves to be a lot better than CW*; they are narrower, work reliably at lower signal to noise ratios and in severe QRM. They open up the possibility of real DX to everyone, not just those with a lifetime's experience of Morse in poor conditions. PSK31 is just such a modulation. Using a narrow, warbly-sounding signal only 31Hz wide, it has about the same capability as CW in the hands of an average operator. So, working VK this and ZL that is really no different from doing it on CW, provided you were any good at that mode. PSK31 is something anyone can do straight away – without years of experience. And PSK31 is identical in the way it is used to old-fashioned RTTY, only narrower and better. If you progress to one of the more modern narrowband data modes on HF, like JT65A, you will work people you can barely hear in the speaker – let alone copy using CW.

What is very, VERY different is the scenario in the letters pages: remote operation and internet radio. Remote operation allows a complete station to be set up in a good location, such at the top of a hill, in a quiet area, in a rare country. It is connected via a remote link to the operator's shack. These days the remote link is usually chosen to be the internet, due to its convenience and widespread connectivity, but could just as easily be a dedicated secure microwave RF link, fibre optic or a pair of wires. It doesn't matter. It is the internet linking bit that appears to upset people. There is no limit to where in the world the remote station can sit. It could be thousands of kilometres away from the operator – in which case, where is the QSO between? That is probably best left to the philosophers...

The reverse setup is also possible: local internet gateways can be attached to VHF repeaters – and are, all over the world. So anyone with a small handheld and using their own callsign can be linked via the internet to another gateway and be chatting to another amateur with a similar small handheld the other side of the world. Is this amateur radio? Why not? Two operators are transmitting and using antennas *in their own back garden* and chatting *to whosoever in their back garden*. They are not pretending it's a brilliant DX contact all round the world; they are simply chatting. The situation is no different to two VHF ops talking on the local repeater. And no one can argue they're not real radio amateurs. But it has NOTHING to do with using DATA MODES.

30m BAND UTILISATION CHART. Ian Wade, G3NRW, recently produced the '30m Band Utilisation Chart', showing in graphic detail the many modes that are in use on 30m today. Reference [1] shows the complete band utilisation, but of greatest interest here is the extremely crammed top 10kHz used for narrowband data modes. An expanded version of this section is shown in **Figure 1**. Ian comments, "It is intriguing to see just how much is squeezed into the band, especially above 10.140MHz. In particular, the graphical approach highlights several overlaps between modes, which weren't at all obvious from tabular frequency listings. It is also interesting to see just how many *Winlink* RMS stations are active: no fewer than 48 stations on 32 frequencies, mostly above 10.140MHz."

A bit more on data-related matters appears in Design Notes this month.

WEBSEARCH

[1] 30m Band Utilisation Chart: http://homepage.ntlworld.com/wadei/30m_band_utilization.htm

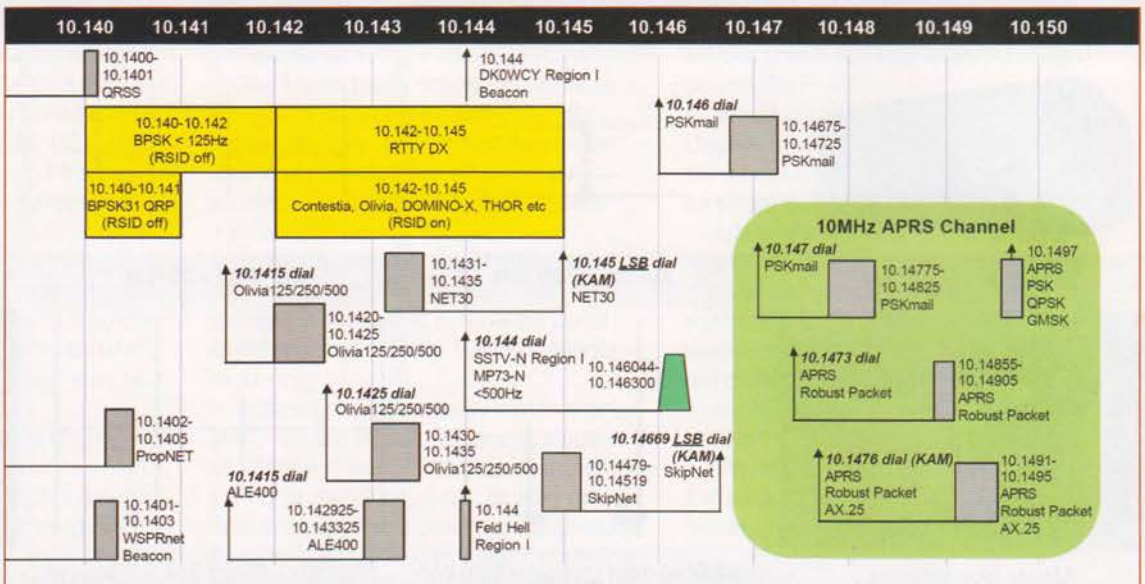

FIGURE 1: The narrowband data segment of the 30m band showing how many modes and users are fitted into just 10kHz of spectrum.

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FT-2000

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ANTENNAS

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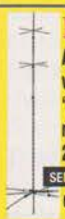

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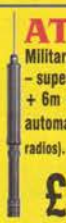

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EMC

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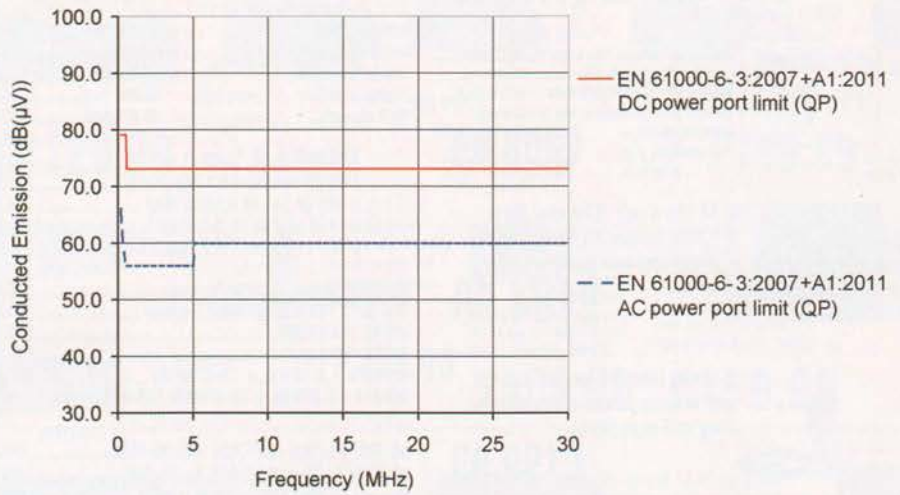

FIGURE 1: Comparison of conducted emission limits applicable to DC and AC ports of solar PV inverters from EN61000-6-3:2007+A1:2011.

LIGHT TO DC. Solar photovoltaic (PV) micro-generation systems have become increasingly popular in the past year due to various incentives. These use a special type of power converter that is sometimes called a 'grid-tied inverter' and, in residential installations, these typically have a peak power rating of several kilowatts. They normally use high frequency switching to reduce the size of the inductive components. Several members have asked for advice about such installations or have reported RFI from a neighbour's solar PV installation.

For any radio amateurs considering a solar PV installation, it is worth checking which EMC standards the inverter meets for the AC and DC ports. The standards are listed in the CE, EC or EU Declaration of Conformity (DoC) for the product. Many companies post their DoC on their websites (see Websearch). Information on EMC standards has been obtained this way for (in alphabetical order): Fronius, Kaco New Energy, Mastervolt and SMA Solar Technology.

Fronius International products that could be used in residential installations include the IG 15 to 60, IG Plus 30 to 150 and TL 3.0 to 4.6. The DoC documents declare conformity with the *Electrical Apparatus Low Voltage Directive* 2006/95/EC and the *Electromagnetic Compatibility Directive* 2004/108/EC.

The declarations list various standards including five or six in the EN61000 series. Some of these relate to AC parameters such as power factor, flicker, harmonics and waveform distortion. EMC standards include EN61000-6-2:2005, which is a standard for immunity to various types of electromagnetic disturbance, including RF fields. EN61000-6-2:2005 is for industrial environments so it is a more demanding immunity standard than EN 61000-6-1:2007, which applies to residential, commercial and light industrial (RCLI) environments. An inverter that meets EN61000-6-2:2005 may be a better choice for a solar PV installation that will be located close to your own amateur transmitting antennas.

The DoC also lists an EMC emission standard, EN 61000-6-3:2007 *Electromagnetic compatibility* (EMC) *- Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.* Further details of EN 61000-6-3 are given below.

Kaco New Energy makes inverters for residential installations including the Powador 2002 to 6002 range. The EMC DoC lists various emission standards including EN 61000-6-3:2007 and EN 61000-6-4:2007. The former applies to RCLI environments whereas the latter is for industrial environments.

Mastervolt International makes the Sunmaster XS2000 to 6500 range. The DoC was not found on the website but the product data sheet quotes EN55022 Class B for emissions. These limits are equivalent to EN 61000-6-3:2007 for radiated RF emissions and also conducted RF emissions into the AC mains but EN55022 does not cover RF emissions via the DC input port so it is not clear what tests may have been done on the DC input port for these products.

SMA Solar Technology AG makes the Sunny Boy range of PV inverters. The EC Declaration of Conformity lists most of the standards listed previously including EN 61000-6-3:2007 for emissions plus other standards for its Bluetooth radio module.

RF EMISSION STANDARDS FOR SOLAR PV INVERTERS. In EMC standards terminology, solar PV inverters are known as grid connected power conditioners (GCPC). At the moment, home GCPCs should meet the generic EMC standards EN 61000-6-3:2007 for RCLI environments. The EN 61000-6-4:2007 industrial emission limits alone (without EN 61000-6-3:2007) are considered too high for a residential environment.

The EN 61000-6-3:2007 standard is a generic standard with conducted emission limits up to 30MHz for the AC and DC ports. The limit for the AC mains port is equivalent to EN55022 Class B but for the DC power port from the solar cells the emission limit is higher, similar to the industrial emission limit for AC mains ports. The reason for this difference is not clear. **Figure 1** shows the Quasi-Peak (QP) DC and AC port limits. It can be seen that the DC power port limit is 18dB higher than the AC mains port limit from 0.5 - 5MHz and 14dB higher from 5 - 30MHz. There are also average limits that are not shown but the average limits are 10 - 14dB higher for DC power ports than for AC mains ports.

Some standards development work is currently in progress at IEC in relation to limits and test methods for DC port conducted emissions for GCPCs although the outcome of this work has not yet been published. The connection to the DC power port of a GCPC has the potential for radiating any RF interference that comes back out of the DC power port of the GCPC, particularly as the positive and negative DC power cables must separate when they reach the solar panels.

The EN 61000-6-3:2007 AC mains port conducted emission limits are the same as EN55022 Class B and it is known that anything that comes close to these limits in the HF bands is likely to cause significant interference to amateur radio reception, even though it may meet the Harmonised EMC Standard. Consequently, making the DC port limits significantly higher than the AC ports does not sound like a good idea from an EMC perspective.

Figure 2 shows a typical residential configuration where a solar PV inverter in the loft is connected to the mains supply

and to solar panels on the roof. It can be seen that the DC and AC power cables from the inverter could act like two halves of a dipole antenna. The lower end of the AC output cable is fairly well earthed at the consumer unit/electricity meter via the underground supply cable while other household circuits could act as elevated ground radials. The upper end of the DC input cable is connected to an array of large conductive panels on the roof and these would have significant capacitance to earth. This could make the DC cable act as a top-loaded vertical antenna for any conducted emissions from the inverter via its cables. The separated positive and negative DC cables may also form a radiating loop antenna at RF.

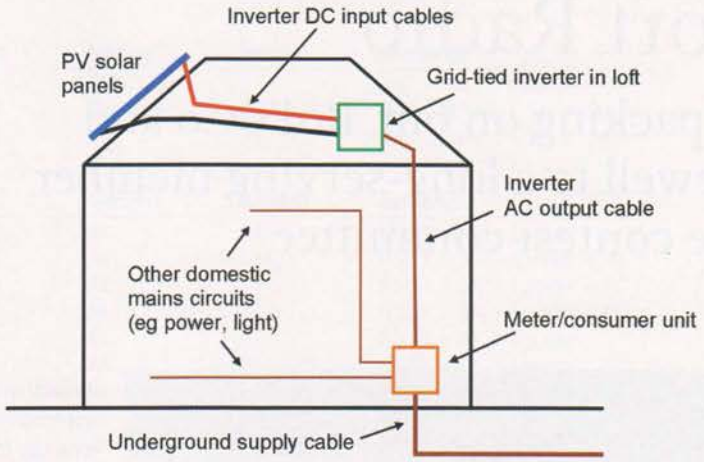

FIGURE 2: Outline of a typical residential solar photovoltaic (PV) installation.

SOLAR PV INSTALLERS' RESPONSIBILITIES. As with the installation of any electrical or electronic system, solar PV installations are required to comply with the EMC Regulations when taken into service. There are no Harmonised Standards for complete fixed installations, nor does the actual installation have to be CE marked. Nevertheless, the EMC Directive and Blue Guide make it clear that it is not sufficient that the separate pieces of apparatus are EMC compliant. The installer also has to ensure that the Essential Requirements of the EMC Regulations are complied with and that 'good engineering practice' has been used in the incorporation of apparatus in the installation. Documentation has to be kept available by the installer showing that this has been done. Ofcom has enforcement powers under the EMC Regulations if non-compliance affects radio use.

Solar PV systems in the UK need to be installed by an installer who is registered under the Microgeneration Certification Scheme (MCS) but it seems that not all installers may be aware of their responsibilities under the EMC Regulations. It would be worth asking an installer about this before having a solar PV system installed.

SOLAR PV RFI. John, G3HTA reports interference from a neighbour's solar PV system installed recently. This report does not imply any non-compliance of the inverter with the applicable EMC standards but it may illustrate that the Harmonised Standards are not sufficiently demanding to protect amateur radio reception or that the exact configuration of the installation can affect the EMC performance of the system.

John lives at the top of a hill with fields on three sides and a few bungalows along the road at one side. His antennas are ona P60 tower that is about 40m from the new solar PV installation. There is a trap dipole for 3.5/7MHz and rotatable antennas for all the bands from 10 to 50MHz. John reports detectable interference on all bands but it is stronger at 18MHz and above. At night, or when it is too dull to send electricity to the grid, a clean carrier appears at 16kHz intervals from 3.5 to 50MHz, typically S2 to S6 in amateur bands when pointing the antennas at the source. When the system is delivering electricity to the grid, the interference changes to a stronger, rasping sound about 8 to 10kHz wide, appearing at intervals of 48kHz.

The principal source seems to be the inverter that converts 386V DC from the solar panels to 236V AC in phase with the 50Hz grid. Fortunately, John's neighbour has been very understanding and helpful. John obtained some large ferrite clip-on cores from Nevada and he ventured carefully into the neighbour's un-boarded loft space. For safety, it would be advisable to undertake any such work with the inverter isolated from the mains and at night when the solar cells produce no output. John reports that the installation was done very neatly and that the inverter is an Aleo Sunny Boy 3000, with 2.4GHz Bluetooth wireless communication. As Aleo Solar appears to be primarily a manufacturer of solar panels, this may be an inverter from another manufacturer.

John noted that there were two single cables carrying DC from the solar panels via an isolating switch to the inverter and one 'cooker type' AC cable (probably 6mm^2 two core plus earth) via an isolating switch to the meter cupboard below. The largest of John's clip-on ferrite cores fits 13mm diameter cable so it wouldn't close around the 18mm wide oval cable. He secured the clip-on cores partly open with nylon cable ties, although he is aware that any air gap greatly reduces the inductance. One core was about 80mm from the inverter and the other about 300mm. For the DC cables, only a short length was accessible, so he placed one ferrite core over each of the two cables about 80mm from the inverter and closed the clamps.

At night, when the system was not producing any electricity, the ferrites provided a useful reduction in the interference. John could not find any interference up to and including the 18MHz band. Above 18MHz, the strength progressively increased up to a maximum of about S5, with no significant reduction on 28MHz and 50MHz. The following day was the weekend of the CQ WW CW contest (28/29 May) and he spent many hours operating CW. The system was delivering electricity to the grid and the broad buzzing sound appeared at 48kHz intervals. On 18MHz and all bands above, it was stronger in day time than at night, but not as strong as before fitting the ferrite chokes. It did not really spoil the enjoyment of the contest, which is confined to the non-WARC bands. John reports that 50MHz is one of his favourite bands and this remains a problem. John asks whether larger clip-on ferrite cores are available and whether the DC current from the solar panels could saturate the ferrite.

A range of clip-on ferrite cores is manufactured by Kitagawa Industries. Type TRCN-40-27-15 has a 27mm diameter aperture and is available from Premier Farnell (see Websearch). Farnell's stock number is 9415831 and they are currently £6.63 + VAT each. Farnell is primarily a trade supplier but private individuals can order components online with a minimum order value of £20 + VAT. As the Kitagawa TRCN-40-27-15 core has an impedance of 48Ω at 25MHz, at least three of these may be required together to achieve a useful amount of impedance if it is only possible to pass the cable through the core once. If this type of core is clipped over a pair of cables such as 'twin and earth' then the currents cancel and magnetic saturation is not an issue.

WEBSEARCH

Fronius International GmbH: www.fronius.com/solar.electronics
Kaco New Energy GmbH: http://kaco-newenergy.de
Mastervolt International BV: www.mastervolt.com/
SMA Solar Technology AG: www.sma.de/en
Premier Farnell plc: http://uk.farnell.com/

Sport Radio

Backpacking on 6m, RoPoCo and a farewell to a long-serving member of the contest committee

PHOTO 1: G4FPH and G3YXM sheltering from the sun while operating G7DDN/P in the 50MHz Backpackers Contest last year.

THE WINNING BACKPACKERS. August is your last chance to take part in the 2011 series of 50MHz Backpackers contests, which were moved this year to coincide with the summer sessions of the UKACs (last year it was a single event, part of the 50MHz Trophy). In it G7DDN/P was the winner, so I asked Chris to tell us about his station. He picks up the story, saying "Last summer, I, together with my fellow Wythall Radio Club member Dave, G3YXM and our mutual friend Mark, G4FPH decided to have a dabble in the Backpackers series of contests. We had already found a local spot on top of a hill (courtesy of some push-biking by Dave and me, to try to get a little more fit!). Forhill Picnic Place is only about six miles south of Birmingham and not the highest point around, but still stands at around 660ft ASL and has a pretty decent takeoff in all directions. Dare one say that it is also ideal in the sense that it has a real ale pub within walking distance? The distance to carry the gear to our chosen grassy knoll was in accordance with the rules for the 3 watt section, so we thought that it would be an ideal place to try out a 'gentler' form of contesting.

"After a couple of tries from this location in the 2m events in May and June, we decided to give the 6m Backpackers a go. This turned out to be a cracking day weather-wise (see **Photo 1**) and represented a real team effort. I had arranged the event and sorted out most of the practicalities. In the week of the contest, Mark designed an optimised 3-element Spiderbeam using EZNEC. Dave built it in his workshop using a broken fishing rod and some leftover wire. No serious testing was done before the day, other than in Dave's backyard between our two home stations to check all was well.

"All three of us contributed gear. Dave supplied the antenna, mast, guying and sundry hardware bits, while I galvanised my Yaesu FT-817ND into action. Also on board was a brand new Ten-Tec 715 RF Speech Processor, freshly imported from the USA, which was to play a part in making us sound louder on the day. My trusty original Asus eeePC900 had SD on it for logging and for power we used a selection of small gel-cell batteries to keep us going for the four hours of the event. G7DDN/P was chosen to be the call used on the basis that it was probably the easiest to say phonetically.

"On initial power-up, we guessed something could be afoot when we could hear nothing but loud TV timebase signals from Eastern Europe. What followed was a VHF contest that felt like an HF one. With only 2.5W into the small beam, we worked all over Europe, from Spain to the Baltic, with best DX being 5B4AIF in Cyprus at 3346km. That's 1338km per watt! On top of our grassy knoll, the 'magic band' lived up to its name."

ROPOCO. The first RoPoCo SSB contest took place in April and in terms of participation can be considered a modest success, because 66 logs were submitted (including two check logs). While this may not be a huge number, it's more than were ever received for RoPoCo1 when it was a CW event. To be absolutely fair though, the reason for the increased participation could be just as attributable to the time of day that it took place – early evening, as opposed to early morning.

For the first time ever, two stations tied for first place. One was someone who was often highly placed in RoPoCo1 when it was a CW event, Graham Bubloz, G4FNL; while the other was someone who had never entered a RoPoCo event before: me! What we now have to see is whether some of those who were tempted to operate in RoPoCo for the first time by virtue of the fact that it was SSB will be inspired to stick with the challenging exchange format and operate in the CW leg this month.

WHAT AN INNINGS. Dave Lawley, G4BUO recently resigned from the Contest Committee after serving on it for 32 years, which equates to more than half his lifetime. For part of that time he was Chairman.

Dave might have gone from the Contesting Committee, but he's not gone altogether because he's still active on the bands and will soon be turning his attention to a special event station that will be operated to celebrate the London Olympics next year. In the passage that follows, Dave details some of the events introduced during his membership of the committee, how the committee met, how contests were adjudicated and some of his

RSGB HF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Aug 7	RoPoCo 2 *	0700-0830	CW	3.5	RST + full PC received
Aug 10	80m Club Sprint	1900-2030	CW	3.5	Both callsigns + SN + name
Aug 25	80m Club Sprint	1900-2030	SSB	3.5	Both callsigns + SN + name

RSGB VHF EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Aug 2	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Aug 6	4th 2m Backpacker	1100-1500	All	144	RS(T) + SN + Locator + PC
Aug 6	144MHz Low Power +	1400-2000	All	144	RS(T) + SN + Locator + PC
Aug 7	432MHz Low Power +	0800-1200	All	432	RS(T) + SN + Locator + PC
Aug 9	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Aug 14	70MHz Cumulative	1400-1600	All	70	RS(T) + SN + Locator
Aug 16	1.3GHz UKAC	1900-2130	All	1.3G	RS(T) + SN + Locator
Aug 23	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Aug 23	SHF UKAC	1900-2130	All	2.3-10G	RS(T) + SN + Locator
Aug 30	70MHz UKAC	1900-2130	All	70	RS(T) + SN + Locator

BEST OF THE REST EVENTS

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange/info
Aug 6	European HF Championship	1200-2359	CW/SSB	1.8-28	RS(T) + yr first licensed (Eu works Eu only)
Aug 14-15	WAE DX CW	0000-2359	CW	3.5-28	RST + SN (Eu works non-Eu only)
Aug 28	IRTS 2m Counties Contest	1300-1500	SSB/FM	144	RS(T) + SN (EIs & GIs also give county)

*HF Championship event +VHF Championship event
For latest RSGB contest information and results, visit www.rsgbcc.org

achievements. How times have changed!

"I was invited to join the HFCC by G3FKM in 1979 and, apart from a period of about 18 months off the Committee in the 1980s, I have served ever since, though in the last couple of years I have not had any contests to check and I handed over the webmaster role to Rob, G4LMW.

"I took over as Chairman from Ron, G6LX and held the post for three years. At this time we still met about ten times per year, usually in London on a weekday evening. I started on HFCC long before entries came in on disk. Adjudication was done with large piles of paper logs and manual dupe-checking and cross-checking.

"There were I think two major achievements during my time as Chairman. First, the GB1RS station at the last ever RSGB Show at the Birmingham NEC. This was to demonstrate contest operation in the WPX CW contest and drew sizeable crowds throughout the show. Many of G4IFB's Contest Guides were sold and I believe it helped to recruit some new contesters and demystify the art of contesting for visitors.

"The other achievement was that the IOTA contest was introduced during my chairmanship. I checked the first event, which I believe attracted about 170 entries [now over 2000]. The original rules for the IOTA contest were drafted by the current Chairman, Ed, who was then G3SQX.

"More recently, together with Justin, G4TSH (during his time as Chairman), I drafted the rules for the 80m Club Championship contests which have proved very popular and brought more newcomers to this aspect of amateur radio.

"Looking to 2012, I'm working with a small group from the Cray Valley Radio Society to organise a ham radio celebration of the Olympics. We will organise the London station, but we are also looking to spread the experience right around the country. The pileups will be awesome and need a contester's skills!"

THIS MONTH'S EVENTS. Perhaps because August is the peak month for holidays, it isn't a busy one for HF contests. RoPoCo 2 is the first event, on Sunday 7th. It's a 90-minute Sunday morning quickie in which you really need to be on your toes to do well, because the rolling exchange of postcodes (PC) is a real challenge. This is the CW leg, the SSB leg having taken place in April. After that we move into the new series of 80m Club Sprints. The series lasts four months and begins with CW on the 10th, followed by SSB on the 25th. The Sprint contest exchange is *both* callsigns, a serial number and your name (or nickname in the case of some people!). After soliciting a QSO you must QSY a minimum of 2kHz before you can call another station or solicit another QSO. Most of the time this will result in you having two QSOs on a frequency before you have to QSY, the first when you call someone and the second when you have taken over the frequency and called QRZ or CQ. All in all the Sprints require quite a different skill set from the Club Championship series that ended last month.

On VHF the first event is the 2m UKAC on the 2nd. The first weekend of the month is definitely one for low power enthusiasts. The action on Saturday 6th begins with the fourth 2m Backpacker Contest. Overlapping with the final hour is the144MHz Low Power Contest. In each of them you exchange the usual information, but also the first two letters of your postcode. Single letter postcodes are padded out to two letters – see the *RSGB Yearbook* or www.rsgbcc.org/vhf/rules/11rules/postcode.htm for a full list. After that it's back to the UKACs, with 70cm on the 9th. The fifth and final 70MHz Cumulative of 2011 takes place on Sunday 14th. The latter half of the month is occupied by the UKACs; 1.3GHz on the 16th, 50MHz and SHF on the 23rd and – because there are five Tuesdays this month – 70MHz on the 30th. The fourth and final leg of the 50MHz Backpackers coincides with the 50MHz UKAC.

Internationally, the 12-hour European HF Championship on the 6th is the first that I'd like to mention. QSOs within Europe are the only ones that count for points. Exchange a signal report and a two-digit number corresponding to the year in which you were first licensed. There are CW only, SSB only and mixed mode sections for high and low power stations. For the entire 48 hours of 14-15th it's pretty much the exact opposite, because European stations work non-Europeans only in the WAE DX CW Contest. The final event of the month is the Irish Radio Transmitters Society 2m Counties Autumn Contest that takes place on Sunday 28th. For stations outside EI/GI, work EIs and GIs only, giving them a signal report and serial number. In return you can expect to receive a signal report, serial number and County. There are awards for the highest placed entrant in each section 'outside of EI'. This often results in them going to GI, but not always – indeed, some sections often have no entries from outside EI. For a list of the 32 Irish counties, see EI8IC's website at www.mapability.com/ei8ic/contest/eicounty.php.

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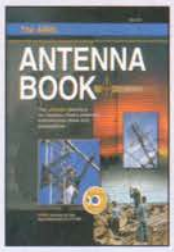

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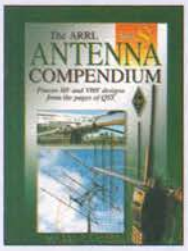

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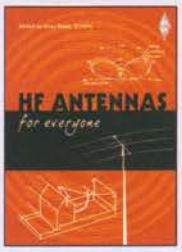

Edited by Giles Read, G1MFG

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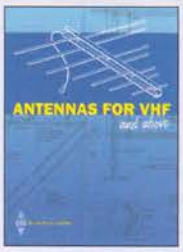

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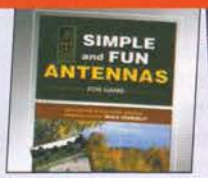

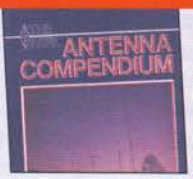

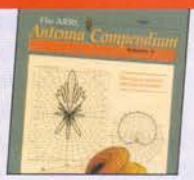

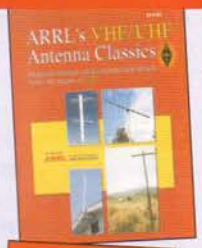

AGAT	ARRL Guide to Antenna Tuners	£17.99	**£15.29**
ATRA	Antenna Towers for Radio Amateurs	£27.99	**£23.79**
ADNB	ARRL Antenna Designer's Notebook	£27.99	**£23.79**
UBAN	ARRL Basic Antennas	£24.99	**£21.24**
AB2I	ARRL Antenna Book	£30.99	**£26.34**
MVAC	ARRL More Vertical Antenna Classics	£13.99	**£11.89**
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**
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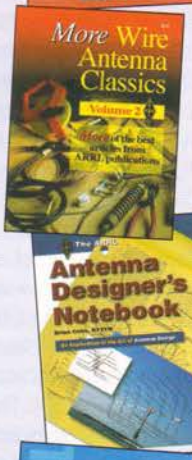

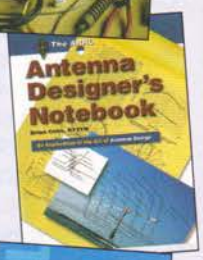

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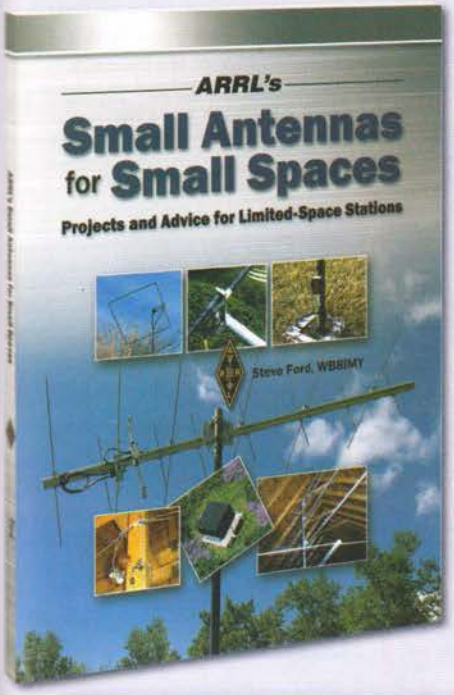
Antenna books

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. This book guides you to finding the right antenna design to fit whatever space you have available.

ARRL's Small Antennas for Small Spaces contains design ideas and projects for VHF and HF antennas you can use inside your home. For outdoors there are dipoles, inverted Ls, end-fed wires, loops, verticals and temporary antennas for HF. You will find compact omnidirectional and directional antennas for VHF that you can install anywhere. There is also a collection of limited space antenna ideas from well-known amateurs, including the innovative Folded Skeleton Sleeve 40 and 20 Meter Dipole Antenna by QST Technical Editor Joel Hallas, W1ZR. This book even provides tips to get you started that include optimising your limited space station, feed-lines, SWR, RF amplifiers, operating modes and RF safety.

If you think antenna dreams, mean you're effectively off the air – think again *ARRL 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**

Stealth Antennas

By Steve Nichols G0KYA

Tiny postage stamp-size gardens, intolerant neighbours, planning permission problems, living in apartments: these are some of the challenges facing the modern radio amateur when trying to get on the air. *Stealth Antennas* offers clear practical advice to those who might have thought they were unable to put up a suitable antenna. From using house rain gutters and drain pipes, or a magnetic loop in the loft, a wide range of ingenious solutions are offered. Designs include magnetic loops, tuned wire loops, small verticals, and more. There are even reviews of a number of commercially-made stealth antennas, and descriptions several more. *Stealth Antennas* also looks at the best way to work DX with a modest station. If you are able to put up a 100ft tower and 6-element beam this book may not be for you. For the rest of us, Stealth Antennas should persuade anyone with an amateur radio licence that they can work the world without a beam, tower and linear amplifier.

Size 174x240mm, 208 pages,
ISBN 9781-9050-8666-5

Non Member's Price £13.99
RSGB Member's Price £11.89

Building Successful HF Antennas

By Peter Dodd, G3LDO

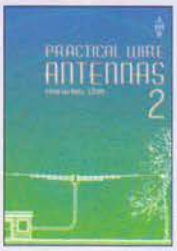
Any metal structure can be made to radiate - to work as an antenna - provided it can be persuaded to accept RF power from a transmitter. But is it working efficiently? How can it be improved?

The construction of all manner of antennas is described including single and multi-band antennas, with and without the need for an ATU. There are also simple wire antennas, loops alongside beams such as the Quad and Yagi. There are variations on these which use less space. Feeding, matching and tuning are included as well as how to terminate coaxial cable in a variety of plugs. Peter's construction experience really comes into its own in the chapters on hardware, construction and masts. There is advice on how to check that your antenna is working using a few simple pieces of test equipment. This is quite simply everything you will need to make the best use of your location, and to build a successful HF antenna.

Size 240x174mm, 224 pages
ISBN 9781-9050-8643-6

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

Practical Wire Antennas 2



Edited by Ian Poole G3YWX

"Probably the best book on wire antennas ever"

Based on the hugely popular *Practical Wire Antennas*, this book is hugely extended and fully revised. Nearly doubling in size with even more designs this book holds many complete and easy to understand recipes for a wide range of wire antennas. *Practical Wire Antennas 2* contains just about every type of wire antenna imaginable including plenty of original designs, so you'll be sure to find one that is ideal for you. Its chapters cover feed lines, dipoles, antennas with tuned feeders, loop antennas and more. There is also a wealth of information and 'know how' on the mechanics of antenna building and includes designs for ATUs for almost every type of antenna. *Practical Wire Antennas 2* provides a collection of antenna designs and ideas that will help capture the enjoyment of experimenting in the true spirit of amateur radio. This book will help improve any station and is a must have book for anyone interested in antenna construction.

Size 240x175mm, 176 pages
ISBN 9781-9050-8604-7

Non Members' Price £11.99
RSGB Members' Price £10.19

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Please send news reports to radcom@rsgb.org.uk. To get future events listed here and put on GB2RS, e-mail details of your meetings as early as possible to GB2RS@RSGB.org.uk and we'll do the rest. We need to know your club name, RSGB Region number, contact name & phone number, date of meeting and detail of meeting. Example: South Bristol ARS, Region 11, Len, G4RZY, 01275 834 282, 29 October, On the Air. It's that simple. September *RadCom* is 1 August and for the October edition it's 1September. 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

COCKENZIE & PORT SETON ARC
Bob, GM4UYZ, 01875 811 723
5 Normal club night
12 18th annual mini-rally night
20 GB2LBN Barns Ness (Lighthouse Weekend)

KILMARNOCK & LOUDOUN ARC
Graham, MM3GDC, mm3gdc@btinternet.com
9, 23 Club night

LIVINGSTON & DARS
Norman, 07740 946192, uk.groups.yahoo/group/ms0liv
2, 16, 30 Club evening
9 Operating evening
23 Morse code practice

Dunoon & DARC held a very successful Foundation licence course and exam recently. The four participants taking the exam had a good pass and two of them, Brian, MM6ANY and Alistair, MM6COU have gone forward to the Intermediate course that's now under way. Trainers were Brian, MM1HMV & Tony, GM7KFS with Moyra, MM3MHS the invigilator. The successful candidates were Brian, MM6ANY, Dennis, MM6DSD, Alistair, MM6CAU and Ian, MM6IPP.

Congratulations to the latest Intermediate passes at **Stirling & DARS.** Left to right are Paul McClaren & Peter Holmes who did doubly well as they joined their studies directly at Intermediate level and only sat their Foundation exam a matter of weeks before, while on the Intermediate course. Then there is Ian Currie, Robert Fraser, Jim, GM4VGR, Wullie, GM0MZB, Paul Homes, Nathan Roberts, Ed Dudley and kneeling down is Fraser Williamson. As usual, thanks to Jim, GM4VGR and Wullie, GM0MZB who held the exam and **Stirling & DARS** for hosting the courses.

Daniel Kennedy (front), aged 10, looks very pleased with himself, as he should be, after passing his Foundation exam and taking the title of the youngest candidate to pass at **Stirling & DARS** (previous youngest was Hayley, MM6HLZ at 12). It is nice to see the hobby being given a family theme as standing behind him is Gari Kennedy, 2M0USE who did a great job of coaching Daniel. Thanks to Jim, GM4VGR and Wullie, GM0MZB who held the exam.

Stirling & DARS has more new members with (left to right) Robert Hutton, Joshua Hutton (10), William, GM0MZB, Kerr Hamilton & John, 2M0BYT. Joshua did extremely well as he did most of his work on a self-study basis as he stays a considerable distance away. Kerr also did self-study under instruction from Ken, GM4NTX and did him proud. Robert also went on to pass his Intermediate exam directly after the Foundation – on the same evening. Thanks to John, 2M0BYT and William, GM0MZB who gave up their time to make the exams possible.

Three members of **Kilmarnock** and **Loudoun ARC** passed their respective exams – Davie, 2M0YFR, Kevin, MM6KCM and Charles, MM6CCS. The students would like to thank the club instructors for the help they received with their studies. The club membership wishes them well with their new callsigns.

Kevin, MM6KCM, Davie, 2M0FYR and Charles, MM6CCS.

Cockenzie & Port Seton ARC held their last exam before the summer break. A Foundation course saw passes for Brian Moerman as well as ATC Cadets Frankie Linn and Scott Gray.

(Left to right) Cambell, MM0DXC (lead invigilator), Brian Moerman, ATC Cadets Frankie Linn & Scott Gray, Bob, GM4UYZ (instructor).

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
4 Junk sale
11 Morse practice + on the air
18 Prepare for Lighthouse weekend
20 International Lighthouse Weekend at Walker Point
25 VHF fox hunt & prep for SSB Field Day

Glenrothes & DARC took part in International Museums on the Air. During the event they made around 128 contacts, despite difficulties with some local interference. The shack is a ex-contractors mobile office and has been converted for amateur radio use by members of the club a couple of years ago.

GB0SSB was on the air from Scotland's Secret Bunker near Anstruther. The Bunker was one of the sites to be used during the Cold War as a emergency government centre in the event of a nuclear war. The club had both HF and VHF stations running SSB, CW and PSK. As well as using the GB0SSB callsign, they have operated from there a number of times as GM4GRC/P and, as all club members can use the site, some have operated using their own calls /P.

The photos were taken by Dave, MM0DYX and show Tam, MM0TGB operating and keeping the log up to date of one of the stations, also John, MM0MBC and Ken, GM3YBQ operating the other station.

REGION 3: NORTH WEST

REGIONAL REP: KATH WILSON, M1CNY, RM3@RSGB.ORG.UK

BOLTON WIRELESS CLUB
boltonwireless@gmail.com
8 Homebrew VHF/UHF Yagis by G0KSC, as built by Mick, M0ICK
22 2m DF field event from Britannia Hotel

CHESTER & DARS
Barbara Green, 07957 870770, www.chesterdars.org.uk
2, 16, 23, 30 No meeting

SOUTH MANCHESTER R&CC
Ron, G3SVW, 0161 969 3999
4 Shack clearance
11 Japanese Morse DVD
18 2m DF report by Peter, G0BHP & Bill, G4SVR
25 PC clinic, Dave, G4UGM
29 Technical forum

THORNTON CLEVELEYS ARS
www.tcars.org.uk
15 Vintage wireless by Ted, G3WBB
22 Talk by Ken, G3RFH

The latest Foundation Licence course held by **Chester & DRS** resulted in 100% success. The photo shows the seven successful candidates, including 8 year old Rebecca, M6RBM. The others are Gerald, MW6AQU, Leigh, M6AQT, Pauline, M6PYR, Andrew, M6AQQ, Steve, M6HCJ and Peter Blackburn.

After several passes at Foundation level, **Castle Rushen High School Radio Club** has just had its first success in the Advanced exam. Despite only being 13, Henry Dorman passed the April exam at the school, which is in Castletown in the south of the Isle of Man. Henry set himself quite a challenge as he passed his Foundation licence at 11 and his Intermediate at 12. He therefore desperately wanted to pass the Advanced exam at 13. Henry is now keen to work anyone who needs the Isle of Man, under his new call MD0HHH. Parents Jane, GD1LVY, Andy, GD0AMD and sister Izzy, MD6IZI will have to queue up to use the station.

The CRHS radio club station is active on Thursday lunchtimes (during term time) with the call

MTOGLK using their new station, kindly donated by Rob, GD4VBA. Thanks go to Liz, MD3EEW and Dan, GD0VIK for invigilating at the exam and to Godfrey, GD4EIP for helping Henry prepare for the exam.

Bolton Wireless Club recently ran a successful Foundation course. Pictured are Gregg Nolan, David Aldred, Stewart Culshaw, Bob Walsh plus tutors Glenn, G6HFF, Ian, G0CTO and chairman Mick, M0ICK.

Macclesfield & DRS is pleased to report more success in the Foundation licence courses. The club has been working in conjunction with the Congleton Air Cadets (230 Squadron ATC) in providing a course and two cadets – Alex Whitmore and Scott Corbishley – have gained callsigns M6PYF and M6ZOM respectively.

Their ATC Civilian Instructor, Eric Westhead, also decided to participate in the Foundation training and is now M6EAL. One of the club's relatively new Full licensees is Simon, M0TGT from the nearby Staffordshire Moorlands. That family has recently rapidly expanded from one radio amateur to four, with Simon's two children – Lucy (15) and Jos (13) – and their grandad, Simon's father Rob, all passing the examination on the same evening. Lucy is now active as M6LEF, Jos is M6JCF, while Rob has the callsign M6CRF.

REGION 4: NORTH EAST

REGIONAL REP: HAROLD SCRIVENS, GOUGE, RM4@RSGB.ORG.UK

EAST CLEVELAND ARC
Alistair, G4OLK, 01642 475 671, alistair.mackay@talk21.com
5 Technical forum
12, 26 On the air
19 Radio magazines evening

HORNSEA ARC
Gordon MacNaught, G3WOV, 01377 240573, gmacnaughtwov@yahoo.co.uk
3 Fox hunt
7 RoPoCo CW
10 80m CC CW plus DVD
17 Committee meeting
24 Visit by RSGB Rep G2DPA
25 80m Sprint SSB
31 Field Day prep for (3 & 4 Sep)

RIPON & DARS
Rob Hall, M0RBY, 0787 608 5631, www.ripon.org.uk
4 Foundation licensees on the air
11, 18 On the air & club night
25 SSB Field Day preparation

SHEFFIELD ARC
Peter Day, G3PHO, sarc@g3pho.org.uk
1 Therapeutic Toy Making, Gordon, G4WEC
8 My OCFD antenna, David, G6DCT
15 The SARC website by M6KSH
22 Summer junk sale
29 Club rooms open as usual

TYNEMOUTH AMATEUR RADIO CLUB
Bob, M6KLO, mail@g0nwm.com
5, 12 Discussion, Operating and Morse Training
19 Briefing for International Lighthouse weekend at St Mary's Island
20 International Lighthouse weekend at St Mary's Island
25 RSGB 80M SSB Club Sprint (G5N)

Hambleton ARS (Northallerton) had two Intermediate licence candidates successfully pass their exam recently. The photograph shows (left to right) Michael, 2E0MJR, Tony, G3MAE (lead instructor) and Ian, 2E0GBA.

Wakefield & DRS has had another successful pass for their training team. Karl Machen (currently M6KMA) passed the Intermediate exam in May and his first words were, "When does the next Full licence course start?" For details of W&DRS Training, contact the Head of Training, Dr David Lockwood, G4CLI on 07748 221855 or e-mail g4cli@wdrs.org.uk.

Mexborough & DARS would like to congratulate John Gibson for his recent success at the Advanced exam. His new callsign is M0ZSJ and club members are looking forward to working him on the bands. The photograph shows (left to right) John and the Advanced tutor, Hans, G3WBG.

During a meeting in early 2010, **Denby Dale ARS** made a commitment to take amateur radio and showcase it to a wider audience within the Kirklees district by participating in a greater number of local events. They wanted to create a truly portable station that would be able to visit schools, colleges and take part in community events and outdoor shows. They wanted to demonstrate modern communication methods to a wide section of the community and show the international bonds that can be forged among radio amateurs. This would enable more people to gain an insight into this wonderful hobby and perhaps reach a younger generation who might otherwise never see an amateur radio station in operation. Whilst the club has a good selection of radios, stage one was to obtain a new all band portable transceiver that could be easily powered by batteries and transported to the various venues.

First of all they successfully applied for a local Kirklees community grant and purchased an Icom IC-706MKIIG radio and LDG IT-100 ATU. The first major event was a local agricultural show in the summer of 2010, where they operated GB2HS using the new equipment for the very first time. The organisers of Honley Show kindly made a generous donation to the club that then enabled them to purchase a new tent. Such was the anticipation of the new arrival they foolishly set it up in the clubhouse one dark winter's evening to make sure it fitted the bill, which of course it did.

The tent being erected in the clubhouse.

The club was well on its way to achieving its goal but realised that perhaps it needed a better multiband antenna for portable operation. Karol, G0UNU came to the rescue by donating a Cobweb and vertical antenna when he upgraded his own antenna system. The radio, tent and Cobweb finally came together as a complete station in June 2011, when GB2HS was once again operated from Honley Show. During 2011 the club plans to operate from the Bicentenary Celebrations at Huddersfield Narrow Canal GB200HNC, Mills on the Air GB2TMI, JOTA and many other local events. Through these activities the club has received lots of welcome publicity and membership has increased too, but most importantly they have been able to promote amateur radio to a wider audience in the hope that the hobby will continue to flourish.

Club members can now operate a modern portable station safe from the vagaries of our English summers and they are sure that the setup will continue to be used for many years to come to take their message across West Yorkshire.

The tent and Cobweb at GB2HS.

Pontefract & DARS is operating a multitude of Special Event Stations in the next few months. Following a busy July, GB0YD will be on the air for Yorkshire Day on 1 August. Operated from the club's shack with the Yorkshire flag flying from mast they promise to even talk to Lancastrians, even if it's only to commiserate with them for being born the wrong side of the Pennines!

Throughout September, GB4BOB Battle of Britain will be operated from the club shack. Originally intended for a one-off last year for the 70th anniversary, the club decided to keep it as an annual event to mark the anniversary.

On 3 September, GB0PH will be on the air for Pontefract Heritage, operating from Pontefract Castle. Activities such as the Wakefield archers display will be taking place. The following day, 4 September, GB4CON will be on the air from the "Festival @ The Farm". Operating from Farmer Copleys at Ravensknowle Farm, this is a fun day with many attractions.

On 10-11 September, GB1AVR will be on the air from Ackworth Vintage Rally.

Finally, for October's JOTA event, GB1PS will be on the air for the First Pontefract Scouts.

Many thanks to Ofcom for dealing with all the paperwork.

REGION 5: WEST MIDLANDS

REGIONAL REP: VAUGHAN RAVENSCROFT, M0VRR, RM5@RSGB.ORG.UK

CHELTENHAM ARA
Derek Thom, G3NKS, 01242 241099, chairman@caranet.co.uk
18 Bring something from your shack

COVENTRY ARS
John, G8SEQ, 07958 777363
5 Planning expeditions by Chris Colclough, G1VDP
12 BBQ & society portable night at Newbold Comyn
19 3rd Round G4ZMC Trophy, Hartshill Hayes
26 Radio workshop

MIDLAND ARS
Norman, G8BHE, QTHR, 01214 229 787
3 On the air, general meeting & training classes
10 Training classes
17 Laptop computers & training classes
24 80th birthday planning evening
31 Rally and Field Day planning

MID-WARWICKSHIRE ARS
Don, G4CYG, 019 2642 4465
6 Club Field Day, 10am
23 Barbecue, 11am

SOUTH BIRMINGHAM RS
Don, 0121 458 1603, www.radioclubs.net/southbirmingham
No training classes this month
1 Shack on the air, open meeting
3 Lecture in the main hall
5, 12, 19, 26 Construction evening
8 Shack painting and renovations
15 Contest planning meeting
21 Visiting Rugby Radio Rally
22 Getting ready for the Telford Rally on 4 September
29 Closed

TELFORD & DARS
Mike, G3JKX, 01952 299 677, mjstreetg3jkx@blueyonder.co.uk
3 Committee /A at Stafford Park; HQ closed
9 Hamfest committee/A at Stafford Park
10 Competition with G3UKV
17 Hamfest planning
19 6 day DXpedition to Guernsey
24 G3ZME OTA and natter night
31 Hamfest final planning

The **Cotswold ARG** is pleased to announce the successful passes of their first three Intermediate course candidates Bob, 2E0XAK, Peter, 2E0IND and Paul, 2E0FLP. James, 2E0OUT successfully sat his exam and is shown with the CARG's course instructor Roger, G3REB. All of the four CARG students are active on the air so please give them a call if you should hear them. Anyone interested in amateur radio in the Gloucestershire area who is considering taking the Foundation, Intermediate or Full licence exam is welcome to contact Don, G4PLE by e-mail to G4PLE@aol.com for further information

Midland ARS recently held another Foundation course and exam. The two successful candidates were Andy, M6CDB and Mac, M6AUO.

Abigail is a Year Six pupil at Moorfield Primary School in Newport, Shropshire. At the age of eleven, she has just gained her Foundation licence. Abigail is now licensed as M6KAP. Also Included in the picture is and the radio her parents and grandparents bought as her reward.

Tamworth ARS held two Foundation exams earlier this year. Congratulations to Neville, M6APG, Jack, M6APN, Albert, M6AQA and Derek, M6APU. Jack is a scout and is a new member of the recently formed Tamworth Radio Scouting Group, Albert is a member of St. John and decided to find out what RAYNET was all about; Derek is the Borough Emergency Planning Officer and also became interested due to RAYNET. The second course saw success for Matt, Jim and Darren, M6BIS.

Worcester RAA has conducted another successful Foundation licence training weekend. Four candidates all passed with flying colours and were a pleasure to teach. Well done to Nick, Rob, Lewis and Derek and club members hope to hear them on the air soon with their new callsigns. Left to right is Nick, Rob, M6EWA, Lewis, M6LGB & Derek, M6DRF.

REGION 6: NORTH WALES

REGIONAL REP: MARK HARPER, MW1MDH, RM6@RSGB.ORG.UK

DRAGON ARC
Stewart Rolfe, GW0ETF, 07833 620733
1 BBQ & social (weather permitting)
15 Chat/SSB Field Day contest planning

WREXHAM ARS
Patrick, 2W0HUU, 07947 701 927, www.wrexham-ars.co.uk
2 Build night
16 DVD night

It's been a busy few weeks for **Merion Amateur Radio Society and Meirion RAYNET** group recently. Lots of pictures and event information has been uploaded to the new website. Information on the club's current activities can be found on the events section of the website. Members and visitors are encouraged to check out the recently updated website to see what's going on – see www.meirion-ars.co.uk. Merion Amateur Radio Society won the Region 6 Club of the Year award.

REGION 7: SOUTH WALES

REGIONAL REP: JIMMY SNEDDON, MW0EQL, RM7@RSGB.ORG.UK

No entries received this month

Cwmbran & DARS has two new Foundation licensees: Chris Hodgetts and Cassandra Ezard, who is just eight years old. Her mother is licensed as MW3EZA and her grandfather is MW0RPB. How's that for keeping it in the family! Cwmbran members would like to congratulate both on passing the exam.

Hoover ARC held a Foundation exam in March. All five candidates passed and are going onto the Intermediate course. The photo shows, from left to right, Paul, Kieran, Jimmy, MW0EQL, Gareth and William, with James in front.

At the recent Foundation exam run by **Rhondda ARS** all three candidates passed with flying colours. The photo shows (left to right) Mike Melody, David and Paul Terrell with tutor Rhys, GW0DIV (extreme right). All look very happy as their pre-exam nerves were whisked away on the evening air outside the club QTH. ongratulations are due to all three. Rhys, GW0DIV and other members now look forward to meeting up with the three on the air.

Aberystwyth & DARS went to the south of Ceredigion County for their June meeting to the Internal Fire Museum of Power at Sarnau, a few miles north of Cardigan, for a specially organised evening visit.

20 club members shared cars to appreciate this interesting and informative working museum that charts the history of operational oil, diesel and gas engines. Amongst the exhibits there were Lister engines generating the site's electricity, the oldest working diesel engine in the UK and a working Crossley Gas Turbine engine for all to be amazed and enthralled by – and, for those engineers amongst the members, drooled over. The museum also has a Ruston 6VE engine that was installed at the BBC Moorside Edge transmitting station and is erecting a 'Trinity House' building to house working foghorns and lighthouse

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TS-590S

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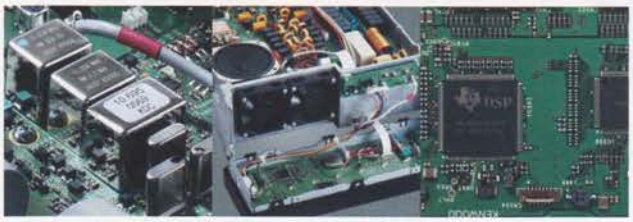

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equipment. This building will also house a radio collection that is expanding all the time and already has an operational amateur radio station. Some of the Aberystwyth Club members operated GB2MOP during the International Museums Weekends in June.

In **June Cleddau ARS** was again operational from the opening day of Pembrokeshire Fish Week festival in Milford Haven using the club callsign GC0SYG/P. After having to endure wind, rain and local QRM from a brass band they were able to make contacts all over Europe on 20m and were also transmitting SSTV on VHF.

Pembrokeshire Fish week is an annual week-long festival of events held each June. Cleddau ARS normally operates a demonstration station and uses the opportunity to promote the hobby by offering RSGB leaflets, badges, stickers and members' back issues of *RadCom* to interested parties.

GC0SYG/P at Fish Week. (L-R) Ray, GW3CR; Sid, GW0UQH, Ian, MW0IBZ and Chris, GW7HAE.

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
8 2m VHF operational night

REGION 9: LONDON & THAMES VALLEY

REGIONAL REP: ALISON JOHNSTON, G8ROG, RM9@RSGB.ORG.UK

BROMLEY & DARS
Andy, G4WGZ, 01689 878089
16 BBQ / natter evening

BURNHAM BEECHES RC
Dave, G4XDU, 01628 625 720
1 Pub meeting
15 On air at the club

CHESHAM & DARS
Terry, G0VFW, 01442 831 491, cdars.club@ntlworld.com
3 General meeting & CW training session
6 Weekend event, RSGB VHF/UHF Low Power Contest
10 Members' forum, bring your radio equipment along
17 My shack by Terry, G0VFW
24 Early days in radio telegraphy by Chris, M0GVT
31 On the air & CW practice

COULSDON ATS
Steve Beal G3WZK, secretary@catsradio.org
8 BBQ at G4RWW QTH

CRYSTAL PALACE R&EC
Bob, G3OOU, 01737 552 170, g3oou@aol.com
5 Summer BBQ

DORKING & DRS
Garth, G3NPC, 01737 359472, www.ddrs.org.uk
23 Social evening

EDGWARE & DRS
Mike, G4RNW, 020 8950 0658, michael.stewart5@ntlworld.com
11 Closed
25 The autumn programme and informal evening

NEWBURY & DARS
Rob, G3LMW, 01635 862737, g4lmw@btconnect.com
24 Mozambique DXpedition by Tony, G4LDL

READING & DARC
Pete, G8FRC, 01189 695 697
11 OTA at Woodley with G0VQR, M0DHO & mystery guest

SOUTHGATE ARC
David Sharp, M0XDS, david.sharp1@tesco.net
19 BBQ

SURREY RADIO CONTACT CLUB
John, G3MCX, 020 8688 3322, john.g3mcx@btinternet.com
1 Club talk
15 Fix-it, advice, chinwag & move-it-on

ULAM ARC
Tony, 2E0WAP, 01727 853087
1 Committee meeting
4 Social with GB3VH, 7.30pm, Queens Head, Sandridge
16 Club night, BBQ, social, 8pm Aboyne Lodge School

WEY VALLEY ARG
www.weyvalleyarg.org.uk
5, 19 Club night

WIMBLEDON & DARS
Andrew Maish G4ADM, 020 8335 3434
5 BBQ at summer camp
7 Summer camp ends
12, 26 Closed

YOUR RSGB SUPPORTING YOUR CLUB

Two members of **Dorking & DRS** recently obtained their callsigns after their success in the Foundation examination, tutored by John, G3YGG.

David, aged 12, a pupil at City of London Freemen's School, now has the callsign M6PIC and Keith, who is retired, is now M6BMB.

A recent talk at Dorking about design using PIC chips was given by Paul, G0ODP. The picture shows David participating in the demonstration, helping Paul to enter callsign data into the program for the iambic keyer PIC design. David had passed his Foundation on the day of the talk and, appropriately, went on to choose M6PIC as his call.

David's entry for the examination was part of an 'agreement' with his father Colin, also a DDRS member, that if he passed, his father would apply for his callsign too. Colin passed the RAE 29 years ago, without applying for a callsign: he is now M0GXV. Could this be a record?

Three RS of Harrow tutors Jim, M0UJC, Ray, G0BSP and Ron, G6LTT are pleased to report, that a recent Intermediate course and exam, with five students, ended with 100% pass rate. The course and exam were held at the 17th Harrow Scout Headquarters, Harrow-on-the-Hill with the kind permission of Vince, G7LWN, the Group Scout Leader.

In the photograph, the five successful students are shown with two of the invigilators. From left to right, Brian, G3YKB (senior invigilator), Ernie, 2E0EAJ, Chris, 2E0RTC, Bill, 2E0SHY, Richard, 2E0NAR, Alistair, 2E0LBX and Ray, G0BSP (tutor and invigilator).

Milton Keynes ARS trainers Andrew, G8GNI and Frank, M0JSZ ran a most successful Intermediate course and were rewarded for their work by having 15 students credited with a pass. Added to the recent passes at Foundation level, the training programme at MKARS for 2011 has had an excellent start.

Bedford & DARC would like to congratulate John on his callsign 2E0XZL and he should, if the radio gods are smiling, be receiving his M0 callsign very soon. John has operated at the special events that the club held at Bromham Mill in Bromham, supporting Mills on the Air and also the Club's special event in support of Ravensden Village Fete, GB0RVF.

REGION 10: SOUTH & SOUTH EAST

REGIONAL REP: GAVIN KEEGAN, G6DGK, RM10@RSGB.ORG.UK

BREDE STEAM ARS
Steve, 01424 720815, M0NUC@aol.com
2, 6, 9, 16, 23, 30 At the shack

HARWELL ARS
Malcolm, G8NRP, 01235 524844, info@g3pia.org.uk
9 Closed
13 Summer BBQ
23 Shack activity night

HASTINGS E&RC
Gordon, 01424 431 909, www.herc.uk.net
20 Surplus/used auction, 9am for 10.15 at Holy Redeemer Church Hall, Upper Church Road
24 Club meeting

HORNDEAN & DARC
Stuart, G0FYX, 023 9247 2846, www.hdarc.co.uk
4 Natter night/social evening
18 History of Purbrook and Widley by Andrew Perrin

HORSHAM ARC
www.harc.org.uk
4 Repairing vintage radios by David Smith, M0SXD
18 Social evening at the Sussex Oak, Warnham RH12 3QW

MID-SUSSEX ARS
Peter, G4AKG, 01444 239371
5 Radio night and table top sale
12 Fox hunt
19 Boules evening at the Crown PH, Newick
26 Windmills by Keith Cook

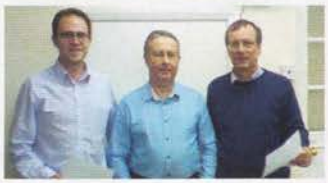
SOUTHDOWN ARS
John, G3DQY, 01424 424 319
1 Chaseley
3 Operating at Hailsham shack

SWINDON & DARC
Den, M0ACM, 07810 317750, www.sdarc.net
4, 18, 25 Activity night
11 DF hunt and social evening

TROWBRIDGE & DARC
Ian, G0GRI, 01225 864 698, E/W
3 Natter night & committee meeting
17 60 days to T32C by Tony Bettley

WORTHING & DARC
Phil, G4UDU, 01903 816684
3 Discussion evening
7 Breakfast meeting in Goring
10 Annual 2m fox hunt, club room will be open
17 HPSDR by John, G0ORX/N6LY
20 Activating Shoreham lighthouse for Lighthouse Weekend
24 Recent trip to VK/ZL by John, G4BLJ
31 GX3WOR OTA & final planning for SSB Field Day

Peter, M0PCR (left) and David, M0HVD (right), thank their tutor Nigel, G3YSW for their three times success. He has not only trained them from Foundation to Full over the last three years, but also encouraged them to join the **Worthing Radio Events Group** and participate in competitions and public events. Founder members Nigel and his wife Chris have chaired and scribed for the club for 10 years. They stood down at the AGM this month to take a well-earned break from the day to day running of the club. They received the heartfelt thanks of all the members present, for whom they had done so much. Nigel will continue to train exam candidates and promote amateur radio at events such as JOTA.



Farnborough & DARS ran its second 2011 Foundation course in June. There were 10 students with an even mix of male and female applicants, the largest number of ladies on any of their courses. Three of the ladies had husbands with a full licence, one had a father with a full licence and one had a long association with CB radio.

All 10 students passed, with the highest group average since **F&DRS** started running training courses.

Nigel travelled down to Farnborough from London for the Wednesday and Saturday and obtained 100% for the 25 questions.

After only being in the job less than six weeks, ML&S's new general manager, Jon Davies obtained the callsign M6MLS.

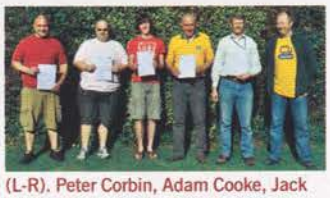
Outer Left and outer right, Lead Instructors John, G3KND and Colin, G8BCO. Back row from left is Laura, Tracy, Jon, M6MLS, Nigel and Paul. Middle row David, Anne and Robert. Front row Kirsty and Roci.

Kris, M6KKB passed his Intermediate exam in June with a score of 39/45. He taught himself using the RSGB book. At the same time his YL, Anna, passed her Foundation exam with the help of the team at **Chippenham & DARC**. She now has the callsign M6BPA. Kris, now 2E0KKB, only passed his Foundation exam 6 months ago and says he has met a lot of new friends through the club and on the airwaves. He and Anna would like to thank Ian, G0GRI and all at Chippenham & DARC.

In May, **Mid Sussex ARS** held its 14th Foundation course. There were 11 students and they achieved a 100% pass rate. All the students are now eagerly awaiting their M6 callsigns. The students came from a wide area, the furthest coming from Canvey Island, 75 miles away! Many thanks to the lead instructor Philip, M5BTB and fellow instructors Chris, G4ZCS, John, G8JBJ, Kim, G7AIE, Gavin, G6DGK, Alex, M0TOT and Rob, 2E0RJA, also to the invigilators Sue, G6YPY and Derek, 2E0KDL for their time and hard work in achieving such a good result.

Back row left to right: Michael Byrne, Ian Sweet, Douglas Hatchman, Neil White, Denis Bailey and Andy Rowland-Stuart. Front row left to right: Adrian Allen, Sue Allen, Andrew Thompson, Chris Lee and Alan Mock. Photo by Alan, G8YKV

Horndean & District ARC ran its sixth Foundation licence class and exam, and the fifth Intermediate exam in April. Training was supported with equipment bought with an Awards-for-All Lottery grant. All six Foundation candidates passed, as did the Intermediate candidate.



(L-R). Peter Corbin, Adam Cooke, Jack Watts, David Harris, Neill Bisiker and tutor John, M0HEX.

Horndean & DARC would like to congratulate the successful candidates and thank the club's Foundation licence tutor (and club training manager) John, M0HEX, the Intermediate licence tutors Mike, G4PRG and Gerry, G3COO and all the exam team.

(L-R) Tutor Mike, G4PRG, Les, 2E0RBM and tutor Gerry, G3COO.

Six candidates attended the Foundation course run by **Harwell ARS**. In the back row (left to right) are David, M6XDB, Conor, M6CRH and Paul, M6KMG. In the front row (left to right) are Karen, M6RTK, Caroline, M6WAH and Anne, M6YMA.

In June, **Hastings Electronics & Radio Club** welcomed five new Intermediate licensees, (left to right) Mike, 2E0OFC, Hollie, 2E0HOZ, Dan, 2E0FRT, Rob, 2E0CWA and Louis, 2E0LPW. They had all previously passed their Foundation exams with Hastings' chief instructor Phil, G3MGQ and had decided it was time to 'up their game'. All passed with flying colours and the projects they did as part of their practical assessment for the exam would have done very well at the Club's construction evening in May. Two had built the Finningley club's SDR receiver project kit (see page 30); at £16.50 it's a real snip but, with surface-mount components, not at all an easy one. Mike used conventional soldering but Dan used the solder-paste and hot air technique – very impressive.

Several of them have now purchased a PCB from Australia and sourced the components in the UK to build themselves an antenna analyser. They also want to start on work for their Advanced exam, just as soon as Phil's Foundation trainees have passed their exam in July.

REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL REP: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

APPLEDORE & DARC
Brian Jewell, M0BRB, 01237 473251
15 Summer Solstice natter night

BLACKMOOR VALE ARS
Tony G0GFL, 01258 860741, www.radioclubs.net/bvars
2 VHF evening
9 Kite antennas by Derek, M0WOB + prep for rally
14 FRARS rally
16 Set up Gillingham & Shaftesbury Show
17 Gillingham & Shaftesbury Show
23 HF evening
30 Natter night

EXETER ARS
Nick, 01363 775756, info@exeterars.co.uk
8, 22 Club night at the Moose Centre

MID SOMERSET ARC
Nick, M6NJB, 01749 346320, nick.bennett@midsarc.org.uk
9 Natter and operations night

PLYMOUTH RC
Chris M0ZCP, 07834 767 161, chrisparker33@hotmail.com
9 Planning Lighthouses on the Air, possible demo of ATV by Ralph, G3KHU

SOUTH BRISTOL ARC
Andrew Jenner, G7KNA, 07838 695471
4 Summer table top sale
11 Committee meeting
18 Summer darts match
25 On the air

TAUNTON & DARC
William, G3WNI, 01823 666 234, g3wni@btinternet.com
3, 17 Closed

THORNBURY & SOUTH GLOUCESTERSHIRE ARC
Tony, G0WMB, 01454 417048, tonytsgarc@btinternet.com
3 Pedestrian fox hunt with Peter, G4OST
10, 24, 31 On the air
17 Video night

TORBAY ARS
Dave, G6FSP, g6fsp@tars.org.uk
5, 12, 19 Natter night
26 Live data demonstration by G3LHJ

WEST DEVON RC
Jules Cuddy, M1AGY, 01752 291588
2 Natter night and open evening
16 Homebrew construction & QRP evening
30 Simple fault finding by Jules, M1AGY

YEOVIL ARC
Steve Crask, G7AHP, steve@g7ahp.co.uk
4 ATU design by G3MYM
11 Mizuho MX transceivers by M0WOB
18 How rotary converters work by G7LNJ
25 Committee meeting & station on the air

Plymouth Training Team and **Plymouth Radio Club** congratulate Kurt Langfeld, Particle Physicist at The University of Plymouth, on passing his Advanced Examination and obtaining his Full licence. Kurt's new callsign is M0KPL. The photograph shows Bob, G7NHB (left) presenting Kurt with a Plymouth Training Team Certificate.

The first four months of 2011 have been a busy and successful time for the members, students and instructors at **South Bristol ARC**. Meeting every Thursday at the Novers Park Community Centre in Bristol, they have held 5 different exam sessions for Intermediate and Foundation students, with great results. In January, four candidates sat their Foundation exam, resulting in passes for Chris, M6BYV, Matthew, M6DXR and Henryk, M6ATX. In March, three candidates sat their Intermediate exam resulting in passes for Andrew, 2E0CFN and Henryk, 2E0HTB. Yes Henryk is very much on a fast track and is planning to sit his Advanced Exam in June. Also in March, one candidate sat their Intermediate exam, resulting in a well deserved pass for Andy, 2E0CFY. In April, two candidates sat their Foundation exam, resulting in a pass for Chris, M6CXB. Later in April another candidate sat their Foundation exam resulting in a well deserved pass for Kaye Schofield.

The club is currently running a Foundation course, with the seven students enrolled likely to sit their exams in July. There is also an Intermediate course for three students and a self study group aiming at sitting the Advanced exam in June. This is keeping the instructors Steven, G0UQT, Peter, G0DRX, Ken, G4XCB and Andy, G7KNA fully occupied at the moment!

Appledore & DARC has been actively encouraging newcomers to the hobby for the last three years by running Foundation and Intermediate licence courses. A particular recent success started when George, who is only 12 years old, visited the club's Special Event Station at Arlington Court last year with Stuart, M1FWD. This was followed by visits to Stuart's shack – and from this, George's interest in radio took hold.

So began the process, at first under the tutelage of Dave, G3YGJ (and then with Stuart when Dave went into hospital). George worked conscientiously at radio from start to end and did lots of listening on his new rig, so it came as no surprise when, in January this year, George turned in a wonderful performance in the Foundation Examination. George is now the proud owner of the callsign M6SWG.

Cornish RAC has recently held a few Foundation courses, run by Graham, G3LAI. The club would like to congratulate everyone who has passed and also give special congratulations to Kira, M6KIR – their youngest member, aged 13. The club is now looking forward to running an Intermediate course later in the year. Although a relatively small club they are always happy to encourage new people into the hobby.

(L-R) Robbie, M6REJ, Treve, M6TCV, Graham, G3LAI (tutor), John, M6AKD and Mike, G1NRF (assistant)

(L-R) Mike, G1NRF (assistant), Paul, M6ASG, Darren, M6TXF, Ray, M6ASJ, Steve, M6SCV and June.

Appledore ARC proved a success with the public at Abbotsham fete on Saturday 25 June. They demonstrated amateur radio, showcasing the hobby and enabled the public to speak to a Dutch operator. There was also a demonstration of Morse code.

Although the weather was mostly dull, the communications most certainly was not!

REGION 12: EAST & EAST ANGLIA

REGIONAL REP: NEIL WHITESIDE, G4HUN, RM12@RSGB.ORG.UK

BITTERN DX GROUP
Linda, G0AJJ, 01692 404154, secretary@bittern-dxers.org.uk
11 Informal meeting at Pinewood Park Leisure Club
20 Weekend event, GB2BML at Blakeney Mariners' Light for ILLW
25 Club meeting at Pinewood Park Leisure Club

BRAINTREE & DARS
John, M5AJB, 01787 460 947
1 VLF and LF by Roger, G3XBM
15 Rig clinic

COALHOUSE FORT ARS
John Parker, M1DUC, coalhouserad1o@yahoo.com
28, 29 Open day

COLCHESTER RADIO AMATEURS
Kevan, 2E0WMG, 07766 543784, kevan2e0wmg@live.co.uk
18 Talk on 4m by Kevan, 2E0WMG

FELIXSTOWE & DARS
Paul, G4YQC, pjw@btinternet.com
8 Field activity evening at Felixstowe Beach
22 Club net on 145.400MHz, 8pm

LOUGHTON & EPPING FOREST ARS
Marc Litchman, G0TOC, 020 8502 1645
6 Get-together at Rainbow & Dove, Hastingwood

NORFOLK ARC
Chris Danby, G0DWV, 01603 898678, cmdanby@btinternet.com
10 Informal / construction / shack / RSGB 80m Club Sprint CW contest
20 International Lighthouse (weekend event) on the air
25 RSGB 80m Club Sprint SSB contest
31 Informal / construction / shack / Bright Sparks

SOUTH ESSEX ARS
Norman, M0FZW, 01268 692776, secretary@southessex-ars.co.uk
10 Working on the tankers by Brian, G7IIO

Members of **Dengie ARC** recently installed in a power supply in their new radio shack and museum at Stow Maries Aerodrome. GB0SMA is the only operational WWI aerodrome in the world with its original buildings. It was built in 1916 by the Royal Flying Corps to protect London from Zeppelin and Gotha air raids.

In April, **Loughton & Epping Forest ARS** completed its 19th Foundation licence training course. In obtaining his Foundation licence, Mark Carter joins his 1st Hainault Scout Group colleagues, Group Scout Leader, Lee, 2E0GSL and Jason, 2E0EER, both of whom attended LEFARS weekend courses in 2010. Also successful were Stephen Dalton, Stephen, M6ATA and Stephen, M6SRE who attended the course with his two sons, Les, M6LWB and Will, M6EHV. An Intermediate practical assessment session was staged for five Foundation licence holders, all of whom went on to pass the Intermediate exam shortly after completing the assessments.

After coming from Dorchester in January to attend the 18th LEFARS Foundation course, Trevor, M6TFX returned to Chigwell Row to meet up again with Mark, 2E0FAK and Cliff, 2E0RCW. Also successful in the exam were Graham, M3VUQ and Mervyn, M6BMH.

(L-R). LEFARS assistant instructor Derek, M0XDC, Cliff, 2E0RCW, Graham, M3VUQ, Mark, 2E0FAK, Mervyn, M6BMH, Trevor, M6TFX and LEFARS lead instructor John, G8DZH.

Norfolk ARC courses are in full flow for 2011 and this picture shows 12 new 2E0's, happy that they have just passed their Intermediate exam. The club is now running its first Foundation course of the year with 11 new candidates who hope to get on the air soon.

At the recent Waters & Stanton open day, RSGB DRM for Essex, Mark Sanderson, M0IEO presented the award for Region 12 Club of the Year to **Essex CW ARS** members Jonathan Mitchener, G0DVJ and Steve Cocks, G4ZUL.

(L-R) Jonathan, G0DVJ, Steve, G4ZUL and Jeff Stanton, G6XYU.

Continued on page 86

REGION 13: EAST MIDLANDS

REGIONAL REP: JIM STEVENSON, G0EJQ, RM13@RSGB.ORG.UK

CAMBRIDGE & DISTRICT ARC
Ron, G3KBR,
01223 501712
12 Come and learn or improve your Morse code
26 The technique of radio repairs, Mark, M1MPW

DERBY & DARS
Richard Buckby,
radio@dadars.org.uk
2 Junk sale
9 Committee meeting
16 Visit to the Network Rail East Midlands Control Centre in Derby
23 Video show
30 On the air

EAGLE RG
Terry, G0SWS,
01507 478590
9 Early history of telegraphy by Peter Day, G3PHO

FRISKNEY AND EAST LINCOLNSHIRE COMMS CLUB
Chris M0MFP,
01507 442240
2 Rally meeting
14 Radio rally

HUCKNALL ROLLS ROYCE ARC
Dave Wilde, G1YAI,
0844 4355593,
secretary@hrrarc.com
4 10km fox hunt, 19.15 GMT, club car park, Hucknall

LINCOLN SHORT-WAVE CLUB
Pam Rose, G4STO,
01427 788356,
pamelagrose@tiscali.co.uk
3 G5FZ on the air
6, 20 In the shack, GB2CWP East Kirkby OTA
10 G6COL on the air
13 In the shack + Saturday surgery
15 Committee meeting
17 Formal meeting
24 Prepare for SSB NFD
27 Saturday in the shack
31 DVD night

LOUGHBOROUGH & DARC
Chris, G1ETZ,
01509 504 319
2 Portable night on air, Humble Lane, near Sileby
9 DF 160m - new rules
16 Open forum, choose a subject
23 Practical evening
30 From My Log Book, July & August

WELLAND VALLEY ARS
Peter D Rivers, G4XEX,
01858 432105,
g4xex@fsmail.net
15 CW night
21 Rugby Bring and Buy sale

In May, Paul Dickson, **South Kesteven ARS**' first Foundation trainee passed his test with a 100% score. He is now the proud holder of the callsign M6AVP. The instructor and other members of SKARS wish him much enjoyment in his new hobby.

In April, Chris, Stuart and Lenny studied for the Intermediate exam at **South Notts ARC**, having completed the practical assessments over the preceding weeks. The projects included an 80m transceiver and a synthesised VFO. The weekend course was conducted by David, M0BWY, Terry, M0RIA and John, G4EDX. All three students passed and await the issue of their new callsigns. South Notts ARC is based in the science centre attached to Greens Windmill in Nottingham.

Friskney & East Lincolnshire CC would like to congratulate Lee, John, Steven and Wayne on passing their Foundation exam in June. Thanks also to M0HAZ for his dedication in tutoring the up and coming candidates. His hard work is appreciated.

A Foundation Course will be held over two Saturdays in September by **M0OCT ARS** if sufficient numbers are enrolled. The dates are 18 and 25 September, 10am to 4pm. The exam will take place on the second Saturday at around 5pm at the exam centre. The venue for the course and exam is close to Chesterfield Town Centre. The fee will include the exam. Details on 01246 275 889 or 07919 173 516.

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

10GHz SLOTTED WAVEGUIDE ANTENNA. Slotted WG16 waveguide with sliding short matching (as used on GB3KBQ), £20. Many other WG16 items available. Adrian, G4UVZ, 01823 421751, adrianwhatmore248@btinternet.com (Taunton).

6ft FIBREGLASS DISH ideal for EME (moon bounce). Moving, so cannot use, £60. 2 x 4 ele 6m Yagis, call for price. 2 x 8 ele 6m long boom Yagis, call for price. Collect only. Trev, G2KF, 07974 892179 (Cornwall).

ALINCO DJ-V17TFH 2m handheld with speaker/mic and 32cm long flexible antenna. As new and boxed, £75 ono. Delivery extra. C R Davies, G3JAU, 01202 514078 (Bournemouth).

ALL TRIO/KENWOOD. TS-530SP, boxed with manual, £275. TS-120V, 10W, manual but no box, £125. VFO-120, boxed with manual, £75. Buyer collects. Chris, G0EXD, 01691 622925, cchallinor366@btinternet.com (Oswestry, Shropshire).

AMERITRON AL-811H linear amplifier, purchased new in May 2011, £700. MFJ-209 HF/VHF analyser, £40. MFJ-1704 4 position antenna switch, £30. Leslie Mayhew, G8RDK, 01903 200930 (Worthing, West Sussex).

ELECRAFT K2-100W transceiver, rev A, S/N 2666. Includes SSB, 100W PA, noise blanker, 160m, audio filter and clock modules. As new, unmarked condition, factory checked to spec last month, £650. John Rollason, G3WCO, 01279 876607, g3wco@idnet.com (Dunmow).

FT-1000MP/AC with INRAD roofing filter mod, all filters fitted except 455kHz 500Hz and sub receiver 500Hz. Very good condition, 2 owners from new, £890. Steve, G0DJE, 07590 964 130, hemsley_stephen@yahoo.co.uk (Thatcham, West Berkshire).

ICOM IC-718 transceiver with UT-106 DSP fitted. Full working order and in excellent condition. Inc manual and original box, £375. Please inspect and collect. Ed Emery, G0WDT, 01782 717837 (Newcastle Under Lyme, Staffs).

ICOM IC-718, narrow INRAD SSB filter, DSP, 5MHz, £525. Icom IC-2E dualband handy, £40. Yaesu FL-2025 2m linear, £45. BNOS 100W 2m linear, £105. RM-10/11m KL-400 linear, £45. LDG Z-100 auto ATU, £120. Black Star Jupiter function generator, £35. Collect. Fred, G1OPZ, 01373 834483, fred.g1opz@gmail.com (Bath area).

KENWOOD TS-480HX. Just over a year old, with all the fixtures and fittings, power leads and mic fully working. £680 + £10 p&p or collection welcome by arrangement. G4FAX, 07713 084244, Rob.macfie@gmail.com (Luton).

KENWOOD TS-940S HF xcvr with built-in ATU, speech module, CAT interface and IRC 400Hz filter. Two careful owners, manual but no box. £375 ono, buyer collects or pays carriage and insurance. Terry, GM3WUX, 0141 423 2683, terry@describe-online.com (Glasgow).

MINI BEAM: WiMo MINI-2000 3 band (10/15/20), 3 element. Only used for 4 weeks – excellent condition. £250 plus P&P. Mike, G3WPH, 07801 881252 (Reading).

OFFERS: BC-221, working, internal PSU. FT-101 Mk 2 & FT-101E, tidy but require TLC. FT-101E, for spares. FV-101 external VFO, tidy and working – choice of 2. Brand new pair of original Toshiba 6S6J6C's. Woden UM2 modulation transformer. Inspect/collect only please. Alan, G3WEF, 01793 538935 (Swindon).

PYE VANGUARD AM25B, service booklet, converted to 2m, with control box etc, £45 ono. Kenwood MC-60A mic, boxed, unwanted gift, £75. Automatic RTTY 6S6 high speed transmitter, GWO, 240V mains, £250. Eric, G3XXO, 01909 472316 (Worksop).

RACAL RA-17, working, spare valve set, manual reprint, £50. Palstar R30 Rx, mint, PSU, manual, boxed, £320. Eddystone 830/7, exc condx but fault in AF. Spare valve set, manual, orig box, £200 ono. Hy-Gain 18AVQ 10/80m vertical, new, boxed, £140. Bob Hughes, G3HAG, 0114 274 7950 (Sheffield).

RACAL RA-1792 HF RX, pre-BITE, good working order, £250. Prefer buyer to inspect/collect. Rupert, G4XRV, 01494 758361, rupert@g4xrv.fsnet.co.uk (Chesham, Bucks).

RADIO VEHICLE. Ex-Ofcom Land Rover Discovery fitted with work bench with 12V and 240V, 8m Heliomast rotatable telescopic mast with compressor, 4 panorama whip antenna mounts, roof box. Perfect for portable operations or expeditions, £5000. Nick, MM0NJC, 07801826012 (Edinburgh).

SANDPIPER V9 all band HF vertical antenna 160 – 10m. £100 cash. Collection preferred or postage at cost. Ken, G3RFH, 01253 821447, e-mail ken.g3rfh@fsmail.net (Blackpool Lancs).

SK SALE. IC-R7000 communications receiver, SSB, FM, FMn, AM. Bargain at £100. Chris, G0RDK, 01782 773185, g1puv@yahoo.co.uk (Stoke-on-Trent).

TH3-JUNIOR 3 element beam, dry stored for 10 years, buyer to collect or post at cost. £100, no offers. Mike Rowles, GW4WWN, 01639 639745, gw4wwn@yahoo.com (West Glamorgan, not QTHR).

TRIO TS-430S 1-30MHz transceiver in good working order, boxed with instruction book. £230. Collection/postage by arrangement. Mike, GW4XSX, 01545 570758 (Ceredigion, Wales).

TS-2000X (boxed, near mint condition) with RigRunner, MP-9600 PSU. CN-801S, CN-801HP, CN-101L, CN-103L, patch leads, £1600 ono. FT-817 boxed, carrying case, near mint, £200. P60 tower, electric winch, DC supply, CobWebb, TBird 3 band HF, rotator with cables, £750 ono. Ian, M1IWB, 07906 238227, ianblackburn14@virginmedia.com (Coventry).

TWO FM CB mobile transceivers. MX-21E, 40 ch, 4W plus DX-27 1/4Ω mobile whip, handbook, GWO, £60. 80m trap for Hustler vertical antenna, £25, boxed, never used. Buyer collects. Gwyn, G0KSG, 01233 812799 (Kent).

Compact, submersible and shockproof, it's designed to ignore the harshest environments.

The VX-8DE, the next generation handheld transceiver from Yaesu, that offers expanded APRS® capabilities.

Integrated APRS® Operation

APRS® allows you to communicate your location to other APRS® stations with your current position (latitude / Longitude), heading, moving speed and altitude displayed on your radio*.

When you receive signals and information from other APRS stations, the VX-8DR displays their positions, heading, messages, distances, icons (43 available), weather information, object etc*.

Smart Beaconing™ Function

When using APRS® for position tracking, the beacon timing is automatically adjusted to your travelling speed and location to plot a smoother trace to match your position and movement on a map. SmartBeaconing™ from HamHUD Nichetronix is able to modify its own beacon rate in response to the motion of the vehicle.

Bluetooth® Capabilities

The Bluetooth® capabilities widely known and utilised among users and enthusiasts of our VX-8E, FTM-10E and FTM-350E radios, are also available with the VX-8DE. The optional Bluetooth® Unit BU-1 makes it possible to operate hands-free with the optional Bluetooth® headset.

* Optional FGPS-2 unit is required to automatically display your station information (shown with optional CT-136 antenna adaptor connected in picture above).

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WANTED

DISABLED FAN OF OLD DAYS seeks pre-1975 QSLs, magazines, etc especially *RADIO/CQ*, *Short Wave Magazine*. Michael, 8 Windsor Road, Reydon, Southwold, Suffolk IP18 6PQ.

KENWOOD TS-940S related items. I'm looking for the AT-230 ATU, SO-1 TCXO, BS-8 bandscope adapter for the SM-200 station monitor (I already have the SM-200). I would also like to find an AVR board for the TS-940S. David Kirkby, G8WRB, 01621 786052 (Althorne, Essex).

LEADER ELECTRONICS CORP signal generator LSG-222 (100kHz to 38MHz) service manual/circuit diagram loan or copy, or any information. All expenses paid. Peter, 2E0PFR, 01947 600041, pfratcliffe@gmail.com (Whitby, North Yorks).

RACAL RA-1772 AND RA-1775 communications receivers in good working condition with RF pre-selector option. Would consider either or both receivers. Stuart, M6AVC, 0161 928 2636, shfur@tiscali.co.uk (Altrincham).

ROBOT 1200C SSTV scan converter or clone. Any condition considered. Ralph Denman, G1LXI, 01438 356630 ralph@pwtphoto.com (Hitchin).

SILENT KEY CLEAROUT or just not needed. I collect QSL cards for their historic interest, preferably from periods before 1970. Please don't throw them away. I can collect or arrange collection. Tony, G4UZN, 01132 693892, AQuest1263@btinternet.com (Leeds).

WIRELESS WORLD 1930-40 bound issues. James, RS34064, james.garvin1@btinternet.com (Ballymena).

HELPLINES

In the *Australian Radio News*, November, 1937 there was a report that Cecil Mellanby of Pwhelli, Wales, heard the Australian 5 metre phone station VK2NO on November 22, 1936. Roger, G8ZMM, is trying to find out if reports were published in any British magazines at the time. Can anyone help? Please e-mail w.bunney@sky.com or write to Roger Bunney, 35 Grayling Mead, Romsey, Hants SO51 7RU.

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond.

7 AUGUST – KING'S LYNN ARC RALLY & CAR BOOT – Gaywood Community Centre, PE30 4DZ. OT 10.00, £1.50, TS, CBS, C, CS (by prior arrangement). Ray, G3RSV, 01553 671307, ray-g3rsv@supanet.com [www.klarc.org.uk].

7 AUGUST – LORN RADIO AMATEUR RALLY – Crianlarich Village Hall, Crianlarich, near Oban FK20 8QN. OT 10.00 TS, B&B, C, WIN. GM0ERV, stewart.mciver@btinternet.com.

12 AUGUST – COCKENZIE & PORT SETON ARC 18th ANNUAL MINI-RALLY NIGHT – Community Centre, Main Hall, Port Seton. Bring along your own 'junk' and sell it yourself. Tables on first come first served basis. £2 for everyone. OT 18.30 to 21.30.

14 AUGUST – FLIGHT REFUELLING ARS HAMFEST – Cobham Sports and Social Club Ground, Merley, nr Wimborne, Dorset. BH21 3DA. TI S22, CP, OT 10.00, TS, CBS, LB, C. Details Mike, M0MJS, 01202 883 479, frars@frars.org.uk [www.frars.org.uk].

14 AUGUST – FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY – The Friskney Village Hall, Church Road, Friskney, Lincs. 6.5 miles south of Skegness. OT 10am to 4pm, £1.50, CP, C, WIN, TI S22, DIS. Details Bren, 2E0BDS, 01754 820 060, felcc@btinternet.com [www.felcc.com].

20 AUGUST – GI HF CONFERENCE – Technology Education Centre, Omagh, BT78 1FA. Registration from 11am. Philip, MI0MSO, e-mail mi0mso@yahoo.co.uk.

21 AUGUST – RUGBY (PRINCETHORPE) ANNUAL RADIO RALLY – Princethorpe College, Princethorpe, Rugby CV23 9PX (SP395710). OT 10am – 4pm, £2, CP, TI, C. Contact Tony, 07759 684 411, rally@rugbyats.co.uk [www.rugbyats.co.uk].

28 AUGUST – MILTON KEYNES ARS RALLY – Bletchley Park, Sherwood Drive, Bletchley, Milton Keynes MK3 6EB. TS, SIG, GB2BP. Why not make this a family day and visit the Betchley Park museum too? [www.mkars.org.uk].

29 AUGUST (Bank Holiday Monday) – HUNTINGDONSHIRE ARS RALLY – St Neots Community College, Barford Rd, St Neots, PE19 2SH. OT 10.00, £2, TI (S22, V44), CP, CBS, B&B, C, TS, RSGB bookstall. Booking required for indoor tables. Contact Clive Burchell, G3NKQ 01480 810473, clive.burchell@btinternet.com.

SILENT KEYS

We regret to record the passing of the following members:

Mr P Bernabeau, EA5BS	2/1/11
Mr J W Tory, G0ETG	6/11
Mr J G Anderson, GM0GVO	29/10/10
Mr R J Drewett, G0GXV	31/5/11
Mr I MacLachlan, GM0HLP	29/1/11
Mr E Eaton, G0WKS	2/4/11
Mr J P Holden, G1IOQ	6/4/11
Mr E J Wellman, G2HJT	11/6/11
Mr R B Irvine, GM3EWC	4/2011
Mr A Upton, G3UZU	12/6/11
Mr J P Ball, G4DPI	23/5/11
Mr E Short, G4NDF	
Mr V A Davies, GW3OCD	28/5/11
Mr I H V Stewart, GI4POV	5/11
Mr I Fairbairn, GM4VJV	9/6/11
Mr G B Done, G7PLR	
Mr B Jones, M1AYP	15/2/11
Mr D J Stokes, M5YPD	
Mr R D Bowes, M6ALA	5/4/11
Mr J T Caldwell, RS53809	10/6/11

27-29 AUGUST – WAINWRIGHTS ON THE AIR ACTIVITY WEEKEND – Stations operating from a number of the Lake District Fells, mostly using 2m FM, calling S20. New Activators and Chasers are encouraged to join in [www.wota.org.uk and http://wota-blog.blogspot.com].

4 SEPTEMBER – TELFORD HAMFEST – Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. OT 10.30. TI S22 & GB3TF 433.200MHz. TS, SIG, discounted admission to Enginuity Centre. Details from Martyn, G3UKV, 01952 255 416 [www.telfordhamfest.co.uk].

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 545671 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 from rally@tars.org.uk.

This list shows all rallies and events we are aware of as at 6 July 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 AUGUST 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
06/08/2011	GB2CWM	Cold War Museum	Suffolk	LH	G4XVE
	GB4HRC	Havering Radio Club	Brentwood	LHV27	M0TAZ
	GB5OLR	Loughton & Epping Forest	Essex	LHV27	G0TOC
12/08/2011	GB2HQB	Harrowbeer Q B (War time callsign)	Devon	TLV	G4BCX
19/08/2011	GB0YAA	Yorkshire Air Ambulance	North Yorkshire	LHV2	G0SNV
	GB1OL	Orkney Lighthouses	Orkney	TLHV27	MM5DWW
	GB4QE	Queen Elizabeth	Essex	TLHV2	M0ZZO
20/08/2011	GB0BHL	International Lighthouse and lightship weekend	Devon	TLH27	G0TQT
	GB0BMB	International Lighthouse and lightship weekend	Hampshire	TLHV27	G4YVY
	GB0DLH	Dungeness Light House	Kent	LHV	M0SSR
	GB2BTL	Belle Tout Lighthouse	Eastbourne	LH2	M0LRE
	GB2ELH	Eshaness Lighthouse	Shetland	LH	MM5PSL
	GB2FL	Flamborough Lighthouse	Yorkshire	LHV27	M0PGE
	GB2HLH	Hustanton Lighthouse	Norfolk	TLHV27	G1KLP
	GB2LBN	Lighthouse Barns Ness	East Lothian	LH	GM4UYZ
	GB2LS	Lighthouse Southerness	Dumfries	TLHV27	G0HPK
	GB2RL	Roker Light	Sunderland Tyne & Wear	LH2	G0GFG
	GB2SCA	Scarborough Lighthouse	Scarborough	LH27	G4SSH
	GB2WHL	Whitby High Light	North Yorkshire	TLHV27	M0GGR
	GB2WLH	Withernsea Lighthouse	Withernsea	TLHV27	G4HYY
	GB4HLH	Harwich Lighthouses	Essex	LH2	M0ZZO
21/08/2011	GB2ELH	Eshaness Lighthouse	Shetland	LH	MM5PSL
	GB2MAS	Mottram Agricultural Show	Mottram	LHV2	G4GHB
26/08/2011	GB4MO	Military Odyssey	Kent	LHV	M1CCF
29/08/2011	GB2NCI	National Coastwatch Institute	Cornwall	TLHV27	G3XNE

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, 0191 477 0036 (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. Details 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, +32 64 849 596, michel.dewyngaert@skynet.be [www.on6ll.be].

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].

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 418371, g7udx@me.com.

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 – Details from Dave, GW4HBK, 01495 228 516, gw4hbk@talktalk.net [www.gw6gw.co.uk].

16 OCTOBER – HORNSEA AMATEUR RADIO CLUB RALLY – Details from Rick, M0CZR, R106221@aol.com [www.hornseaarc.co.uk].

23 OCTOBER – GALASHIELS AND DISTRICT ARS RADIO RALLY – Details from Jim, GM7LUN on 01896 850 245 or mail@gm7lun.co.uk.

29 & 30 OCTOBER – NORTH WALES RALLY – Details from Liz Cabban, GW0ETU on 01690 710 257 or lizcabban@vodafoneemail.co.uk.

30 OCTOBER – HOLSWORTHY AMATEUR RADIO RALLY – Details from Roger Williams, 07773 983691, gsowter@talktalk.net.

6 NOVEMBER – WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally)

12 NOVEMBER – ROCHDALE & DISTRICT RS TRADITIONAL RADIO RALLY

20 NOVEMBER – 34th CATS RADIO & ELECTRONICS BAZAAR

20 NOVEMBER – PLYMOUTH RADIO CLUB RALLY

4 DECEMBER – BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY

2012

5 FEBRUARY – 27th CANVEY RADIO & ELECTRONICS RALLY

22 APRIL – 28th YEOVIL QRP CONVENTION

24 JUNE – WEST OF ENGLAND RADIO RALLY

4 NOVEMBER – HOLSWORTHY AMATEUR RADIO RALLY

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement may do so free of charge by e-mail, or by post provided the advertisement is accompanied by a payment of £5.00 to cover administration costs.

The following terms and conditions apply to all Members' Advertisements.

1) In order to qualify for free insertion, Members Ads must be submitted by e-mail to memads@rsgb.org.uk. Please ensure you include .uk on the end of the email address.
2) **Your advert must clearly show whether it is For Sale or Wanted and must include your name, callsign or membership number, telephone number and postal town, in that order.**
3) The Ad may not contain more than 40 words, excluding the information in (2), and may be edited for readability at our sole discretion. Longer ads may be accepted if there is a good reason, eg a shack clearance on behalf of a SK member; e-mail us and ask.
4) Not more than one ad per month will be accepted from any member. 'Recurring' ads will not be accepted, but members may re-submit the same advert each month if they wish.
5) E-mailed adverts may optionally include one photograph of the item(s) being offered. Images must be attached as a jpg file, at least 800 pixels wide and of good quality. By submitting any image you warrant that you own the copyright and that you permit the RSGB to use it in any way. We will endeavour to publish photographs with ads as space permits but cannot guarantee to publish any particular photograph.
6) Adverts will be published at the first available opportunity but no guarantee can be given as to when a particular ad will appear.
7) The RSGB believes that it is inappropriate for members trading in radio equipment in any way to place members' ads. We therefore regret we are unable to accept such ads, although we do welcome these in the 'Classified' advertising section of *RadCom*.
8) The RSGB accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange.
9) Members' Ads are accepted and published in good faith.
10) Members' Ads are accepted at the sole discretion of the Editor, whose decision is final.

WARNING

Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement.

The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the money paid.

Members' Ads also appear on the Members-Only website at www.rsgb.org/membersonly/membersads.

CLASSIFIED ADS

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, Fir Trees, Hall Road, Hainford, Norwich, Norfolk, NR10 3LX Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

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CLASSIFIED ADS

A PLEA TO OBSERVE CW PROCEDURES

Alan Sutherland, G4HEQ/DH2AS

Radiotelegraphy, commonly known as CW, is a dependable means of communication with operating procedures established over decades. The day may well come when skilled CW operators are once again needed for emergency worldwide communications. Recent events teach us that nothing is inconceivable. If all other systems break down, a ten-watt transceiver powered by a car battery, with a wire aerial strung between trees in the hills of a country may be a lifeline. Bad practices engendered by contests, where people learn only to fire pointless numbers at each other, have now become so common on the bands that they make proper working very difficult. The problem is compounded by sheer carelessness in sending Morse. If you make a mistake, which we all do, correct it. An H is not a 5, nor is it an S. You know what you mean, but does the other operator? These bad practices are not confined to any one nationality; we hear them all over the bands.

Forty metres is a good example. That band often serves for much enjoyable Europe-wide operating, as well as for DX. If you call CQ and a station comes on your frequency, simply firing a callsign, what does it mean? Is he calling you or a DX station you cannot hear? This happens often, causing confusion, misunderstandings and, sometimes, offensive behaviour.

The correct procedure is to send the other station's callsign once, then 'de', followed by the calling station's callsign twice, then 'k'.

Also, the station calling CQ decides which station to take up in a QSO. We don't force ourselves on people, nor do we take over the frequency.

Let's make an effort to maintain standards in this excellent and, one day perhaps necessary, means of communication.

ETIQUETTE

G0WOU

I am writing to ask where the etiquette has gone from amateur radio? The misuse of the amateur bands and the repeaters in the south west are becoming atrocious – only the last three letters given of callsigns on the repeaters when station is breaking in, people talking over the top of you when having conversations, CB language and so on. This is not amateur radio etiquette. I'm afraid that this great hobby of ours is becoming intolerable and going downhill very fast. Please teach these stations, newly licensed or not, to listen and learn and become better operators. There are plenty of radio hams willing to help the newcomers to the hobby and help them along. It's about time the amateur radio operators in this country started getting together and stamp out these problems before the radio spectrum becomes too much abused.

Be polite and courteous at all times and don't tune up your radio on a frequency where there is a QSO going on – use your manners and behave.

WASTE OF TIME

Doug GM0ELP

I am sure I have read a hundred such letters in *RadCom* since I was licensed. If you don't believe me, let me predict the response from the contest fraternity – no contesting is allowed on the WARC bands, I suggest Bill tries the WARC band on the weekends where he will undoubtedly meet up with his long lost friends who realised this fact years ago.

Come on, surely *RadCom* can find a better topic to print that will interest rather than provoke the readers.

A letter about contesting isn't included in to provoke a response, it's in RadCom because it is something that elements in the membership feel strongly about and RadCom is the place they feel they can discuss their views – both for and against. On subject like contesting, if we publish a letter it's because we've received several along the same lines and will, no doubt, receive many more after publication. Contesting is one of the 'Marmite' subjects – you seem to love them or hate them – but the reasons are many and varied. Personal enjoyment of the bands is something that means a lot to radio amateurs and members of the RSGB must always see RadCom as a place they can air their views, even if it's not as often as they may like.

Rob Macfie, G4FAX

I was gratified to read the letter by G4GHB (July 2011) entitled "Waste of time", a man after my own heart. I, like the majority of radio amateurs, work during the week and therefore only have two days a week to experience the bands in daytime conditions. I am not amused therefore when I find that as soon as I switch on I hear "CQ contest". As a result of this I sold my gear six years ago. However, amateur radio is addictive and I am trying to rebuild a station in a less than ideal location but am worried that I am again going to be forced off the bands by the contesters. So here is a very simple solution – why not hold the contests during the week? If they were held on Mondays and Tuesdays then the stations would have the weekend to set up and test, and also give non-contesters a chance of working them under more relaxed conditions. I am sure that the diehard contesters would not object to competing in the week and the rest of us would have the full use of the bands in the only time available to us.

Contests are not amateur radio, they are a mere facet of it, but they cause problems out of all proportion to their worth. It is not training for emergencies when hundreds of thousands of pounds (dollars) are spent on setting up a fixed contest station. It would be a better test if all contests were portable but I guess that would be too much to ask. It is not acceptable to say that we have the WARC bands exclusively for our use, we non-contesters, like everyone else, have nine HF bands available to us so please give us a chance to use them.

While we are on the subject of making pleas, I would like to reiterate another point made by G4GHB, namely if giving a signal report, make it a truthful one. I have often wondered how many of my reports to DX stations that left me as "4 and 4" went down in the log as "5 and 9". I too have had operators try half a dozen times to get my call correct only to give a 59 report. Maybe writers of logging software should leave the report boxes blank rather than fill them with 59 as default.

Mike, G3TMB

I could not agree more with Bill, G4GHB (*RadCom* July 2011). I have just had a listen on 20 metres (25/6/11) and there is yet another one on with people exchanging their silly numbers and cluttering up the bands. The WARC bands were almost dead as far as I was concerned, CW wasn't so good either, so like Bill I just switched off!

I could see the point when I was first licensed in 1964 when I think the majority used home brew equipment and aerials as I did. Then it was great to compare signals etc, but now with 1.5kW stations and huge Yagis at heights, usually it's the one who can shout the loudest! Bill's letter summed it up nicely!

Eric Edwards, GW8LJJ

I am in sentiment with the letter from Bill, G4GHB and agree that the hobby has changed over the years. This can be the case with many hobbies and activities of course and is, perhaps, called 'progress'. Whether it is for the better or worse is a matter of opinion.

The days of home-brewing is certainly not dead but is not as active as it was, percentage wise, when ham radio equipment was not as readily available or affordable. Some equipment is obviously cheaper to buy than make when costing all the individual parts, especially if the same performance is to be obtained. However, home-brewing is still an exciting part of the hobby, and indeed that is my interest. Note I say part of the hobby! That's exactly the point with this and many hobbies. There is more choice and many opportunities to add more branches to our hobby tree. Whichever one you take is up to the individual. We have a choice and not restricted to any part, as long as the license regulations are observed of course.

If anyone is not interested in any aspect of the hobby, then there's no need to take part in it. There are plenty of opportunities to improve your radio skills by building your own gear and this is applicable to QRP and QRO transmitters. One activity that many, including myself, is making and achieving

the most out of AM home-brewed receivers and transmitters. Some may think that this mode is outdated and has no place in ham radio. Well, there are a lot of home-brewers out there that would disagree.

There is achievement in going on the air with a transmitter that you made yourself, especially when it is performing better than some of the commercial AM transmitters. With a correctly set up speech process to limit the bandwidth and produce up to the maximum of modulation without the worry of over-modulation, it is satisfying to get reports back about an excellent quality fully modulated signal, especially when you receive this report on a home-brew receiver as well.

So, leave the contest-workers to do their bit, the rag chewers do theirs whilst others can join the growing population of affordable home-brewing their own transmitters and receivers.

For some inspiration and, indeed, to find out how cheaply this can be done, take a look at my website, www.GW8LJJ.com, or my QRZ.com site. I am not a trader, just a dedicated home-brewer wanting to encourage home brewing of amateur radio equipment.

There's room for us all.

Dave, G0OIL

I feel I have to reply to Bill, G4GHB's letter regarding contests (*RadCom*, July 2011). Bill does a commendable impression of Mr Angry. As the movie director says on the commercial and as the PM said in the Commons recently: "Calm down, dear!". 12, 17 and 30m are always contest free zones and SSB contests leave the CW segments as a haven of non-contest peace.

Bill says that there's no self-training in contesting – but there's much to be learned in building and operating a competitive contest station: engineering, ionospheric propagation knowledge and slick operating to name just a few.

Sometimes contests bring other benefits: I proposed to my fiancée (Lesley, G7NAD, now my wife for 18 years and counting) in a wet, rainy field at Flamborough Head during the VHF Field Day 1992 contest. She accepted! We suffered generator and antenna problems as half the site ended up as a mudbath... but I got the best contest result of all time!

G3GPO HELP

Dave Thorpe, G4FKI

We are in the process of forming a new radio club based at a former post office receiving station.

The idea was mooted about using the callsign G3GPO, looking back through 1950s callbook reveals it was held by a post office club in the Bradford area, but the callsign disappeared from the callbook by the early sixties.

I am trying to trace anyone that can help to track down the original licence holder of the callsign, to see whether it can be reissued. Please contact me by e-mail to thorpe.319@ntlworld.com or QTHR.

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TECHNICAL ADVICE

Dr Guy Simmons G4DWV, 4X1LT

In the past two *RadComs*, in an article about a low HF antenna and a motorbike mounted vertical; there has been, in my humble opinion, a worrying trend.

In both cases there were warning boxes from the technical panel. Each contained two warnings. One warning was common to both.

The first warning was to make sure that parts of the HF antenna could not be touched for fear of giving an electrical shock. Fair enough, and the only warning that I am discusses that passes muster in being sensible and valid.

The second, that it is "prudent that the antenna be mounted as far away from the fuel tank as possible". Whilst in principle this may be a good idea, in reality it is seriously flawed. In real life, the antenna is either close enough to prevent a real hazard or safe. The problem is that "as far away" as possible might not be far away enough and could possibly be positively dangerous. In effect, dangerous advice is being given.

The third point, which was either mentioned or alluded to in BOTH boxes is the danger of high field strengths (limit of 10W in Low Doublet and antenna as far as possible from body on motor cycle). Perhaps the RSGB is in favour is the situation that could still exist in Israel where each amateur antenna installation has to be checked by the government? Without any figures or mention of current exposure limits; such qualitative warnings are without merit and alarmist.

I would expect better science from the RSGB.

First, technical articles submitted to RadCom *are subject to a peer review process. The process takes into account the very nature of the hobby ie that radio amateurs do like to experiment and try different things out. This ethos is something that I would actively encourage and has undoubtedly led to a better* RadCom *in recent years.*

Taking the antenna article first. I am of the opinion that the antenna design is in itself not "unsafe"... It is entirely dependant upon the circumstances in which it is used. It is the radio amateur's responsibility and duty of care to assess the circumstances, identify any hazards and take appropriate precautions. It would clearly be beyond the scope of a short antenna article to cover every circumstance hence the advice that was given.

In respect of the second article the advice I believe was sensible. It correctly identified hazards and without going into too much detail suggested possible solutions. It is indeed debatable to what level of detail safety advice should be given in RadCom *as some of the areas are of a specialist nature. There may be specific manufacturers' instructions or statutory regulations that may apply. In either case should there be any doubt then professional advice should be sought.*

Leslie Butterfields, G0CIB
Chairman, Technical Forum

NEWBURY RADIO RALLY

Tony, G3ZRJ

I would like to thank the organisers of the Newbury Rally for all their hard work. I attended with two friends, G4FAD and G0VQW, we all agreed that the Rally was superb. Plenty to look at and lots of chance to meet and talk with fellow enthusiasts. The Newbury Rally is a rally is in the old sense. Well done to all involved.

SPIRIT OF AMATEUR RADIO

Clive Young, M0BGA

Thank you to the readers of *RadCom* who responded to my recent wanted ad and took the trouble to send me circuit and other data on the type 65 test set. The amateur radio spirit is still strong and well.

SHEER MAGIC

Dave, G3MWV

Following the June *RadCom* review of the Goodwinch tower winches, pages 52-53, I purchased a TDS 12.0 type winch for use on my very heavy duty 60ft Westower. This mast has quite a large and heavy headload and is also exposed to the North Sea gales, the top antenna being 180ft above the sea level. I can see several miles out to sea from the top of my mast!

The antennas are all built to a high standard using double walled elements. The winch was simple to install many thanks to the advice given by David, M1AEI, the Goodwinch MD.

A simple camping trolley was obtained from Argos and was adapted with a tray to carry the battery, cables and a charger.

It is sheer magic to stand back and watch the mast rise into the air like an Apollo spacecraft leaving its launch pad!

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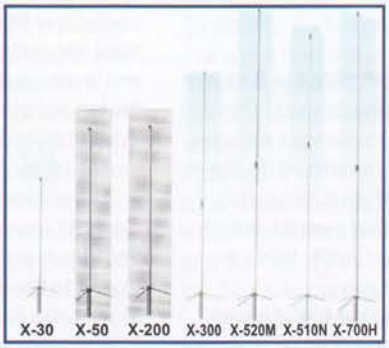

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This Auto ATU will handle really high power, which makes it well above UK limits and also offers great efficiency. You get the same fast tuning, with cross needle metering & LCD display. Coax, balanced or wire. **£669.95 C**

MFJ-928 Econo 300W Auto ATU

Here;s a very economical Auto ATU. No metering, but lightining fast tuning with 20,000 memories and wide matching range. Leave it in-line and just forget about it! **£203.95 C**

MFJ-927 Remote ATU

Here's a great way to tune wire or coax. This fully weatherproof ATU will sit outside right by your antenna and with the included "power thru" box, you feed the DC supply up the coax. No separate hh cable needed. **£254.95 C**

MFJ-969 300W Roller Inductor

160 - 6m, it will match wire, coax or balanced. It reads true PEP (requires 12v DC or internal cell), Fiitted cross needle meter and, Dummy load, and QRM-Free Pre-Tune. **£219.95 C**

MFJ-941E 300W 1.8-30MHz

Great calue, has cross-needle meter, 1000v balun and 8-position selector switch. A great ATU at budget price. **£144.95 C**

MFJ-989D 1.5kW 1.8-30MHz

The latest version gives lower losses and true peak reading. Includes 6-position antenna switch and dummy load. **£399.95 C**

MFJ-948 300W Roller Inductor

Very similar to the MFJ-949 above, but without the dummy load. The same 300 Watts and the same great design. This tuner will meet all your needs and your antennas. **£164.95 C**

MFJ-945E 300W 1.8-30MHz

Designed prticularly for coax mobile systems. Now you can move around the band so much easily. **£134.95 C**

MFJ-962D 1.5kW 1.8-30MHz

This low profile model retains the 1,5kW and incorporates a roller coaster tuning and twin needle meter. **£299.95 C**

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**

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MFJ-259B

1.8 - 170MHz Analogue meters. Measures VSWR, complex impedance & magnitude. Coax velocity, distance to open or short circuit. Counter, generator, inductance, capacitance, freq counter & LCD digital display. **£269.95 C**

MFJ-269

Covers 1.8-170MHz & 415-470NHz plus 12-bit A/D for improved accuracy. Reads complex impedance, magnitude PLUS parallel resistance & reactance! Read coax specs & problems. Plus acts as generator & freq. meter. N connector. **£369.95 C**

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