RadCom

RADIO SOCIETY OF GREAT BRITAIN ◆ WORKING FOR THE FUTURE OF AMATEUR RADIO

JULY 2014
VOLUME 90
NUMBER 07
£4.95

British 144MHz ARDF champ Andrew Soltysik, G4KWQ

0714

The Sky Painter

A portable 40m self-supporting dipole that fits easily in the back of a small car

Maritime Mobile

Using a handheld on a ferry

International Marconi Day

Activating Luttrel's Tower at Calshot

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WATERS & STANTON

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FAX: (+44) 01702 205843
Email: sales@wsplc.com
Opening: Monday - Saturday 9am - 5.30pm

Scotland & Northern Store

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Sposers of RSGB Club Of The Year

West Mountain Deals

The NEW RigBlaster Advantage

Features

• Internal sound card • Single plug and play USB cable • Automatically mutes mic audio • Instant Mic Setup Connectors • Front panel controls with VOX delay control • Rig control interfaces for CAT, CI-V or DB9 on radio • High speed keying output for keyboard CW and RTTY software

RigBlaster Plus II £159.95 c

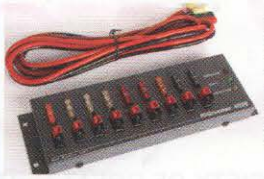
Plug and Play USB port for connection to PC and power. Great performance at a realistic price.

RigBlaster Plug & Play £109.95 c

Here is a great way to enjoy data at a budget price. Plug and play is the name of the game here!

RigRunner

The smart Way to Run Your Rig!



Each unit includes 2m main feed cable and is rated at 40A unless stated otherwise. Each output is individually fused and all connectors are of the Anderson type.

YAESU

Choice of the World's top DX'ers

£1,266 d Inclusive of Cash Back

FT-DX1200

In Stock!

Part Exchange & Cash Back

FT-DX3000 HF & 6m Transceiver

Peter Hart Review in RadCom: **£1902 d** Inclusive of Cash Back

"There is little I could find fault with."

The new HF generation of base stations from Yaesu/ Built in auto ATU with advanced DSP and superb roofing filters.

Call us for some really special deals - PLUS FREE CREDIT

More Exclusive Yaesu Deals from Top UK Yaesu Dealer!

FT-897D HF - 70cm 100W **£749 d**

The FT-897D is a very compact radio, like the FT-817ND on steroids. All modes and all bands in a very compact package .

FT-DX5000MP

We have the latest version of this great transceiver at a great price.This is the Yaesu Flag Ship radio that has proved itself with DXers around the world. Now offered at a really great price.

Includes £250 Yaesu Cash Back **£3975 d**

Buy Now Pay Later - Another Great service from Waters & Stanton

Now you can afford to buy that dream radio. Just come into the store with ID (driving licence, passport credit card or utility bill - we need two of these) and we can sign you up while you wait. Alternatively we can email you the forms and arrange it within 24 hours.

SIX MONTH DEAL - You pay no deposit and at the end of six months you must pay the purchase price to settle the debt.

TWELVE MONTHS - You pay no deposit and at the end of twelve months you must pay the purchase price plus £15 settlement

Our NEW BABY - Weather Station

W-8682-MKII

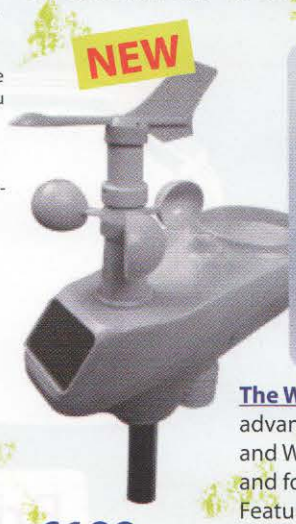
NEW

Ideal for hams or normal domestic use. This lovely little station will give you a true picture of what is happening outside including rain, wind, temperature, pressure and trends.

Just £49.95c

Weather Station W-8681-Pro

NEW



The W-8681 Pro Weather Station. It's our most advanced yet. Full colour touch screen with SD card and WiFi that enables you to get the full picture and forward forecast. It is totally wireless. No wires. Features: UV, Wind dir. & speed, humidity, in/out and min/max temp., Day and week, Pressure, Forecast, C/F, Clock, History. AC mains powered display.

£199.95

WATSON Power Mite-NF

£69.95c

- Output Voltage Variable: 4.0V - 16V
- Output Current: 22A Continuous, 25A Peak
- Output Voltage Regulation: Less than 1%
- Red Trip Warning LED, Green Power LED
- Dual V/A Meters with Back LightSpecifications

ICOM

Dual Band Touch Screen D-Star **ID-5100E**

NEW

D-Star Touch Screen with **FREE UK NEXT DAY DELIVERY**

£569

SAVE £126!

ID-5100E Deluxe £715

ID-5100E plus Bluetooth UT-133 module and VS-3 Bluetooth headset, MBF-1 Suction mount, MBA-20 Control bracket, and MBR-100 Trunion bracket. Representing a saving of £126 on the package. Please note the additions listed will be delivered by Icom UK in August.

YAESU

Choice of the World's top DX'ers

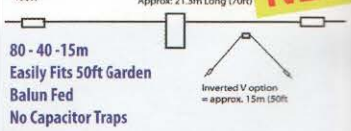
FT-817ND HF - 70cms 5W All Node Transceiver

Here's a great combination offer for those who want to go portable with a complete station including matching auto ATU and case for the transceiver. All battery operated and capable of feeding even a long wire. Comprises FT-817ND, Case and Elecraft T1-A auto ATU.

Complete Package **£699 c**

WATSON Compact Dipole

NEW



80 - 40 -15m
Easily Fits 50ft Garden
Balun Fed
No Capacitor Traps

This half sized 70ft dipole will get you on the LF bands with ease. For small gardens erect it as an inverted "V." As a bonus it operates as 3 half waves on 15m. Far easier to feed than the G5RV. Coax all the way.

£79.95 c

Coming soon, Dual band 40/20m compact dipole approx. 11m long. Phone for delivery.

InnovAntennas

For Immediate Shipment

144MHz	Elements	Boom L.	Gain dB	Price inc VAT
144-LFA-3	3el	0.67	8.67	£59.95 c
144-LFA-4	4el	1.17	9.49	£74.95 c
144-LFA-5	5el	1.79	11.16	£89.96 c
144-LFA-6	6el	2.41	11.88	£104.95 c
144-LFA-8	8el	3.73	13.32	£164.95 c
144-LFA-9	9el	4.40	14.06	£194.95 c
144-LFA-12	12el	7.13	15.80	£269.95 c

NEW

10m Tiltover Mast Ground Mounted

The ideal mast for the smaller QTH. Galvanised and winch operated. Includes 3m mounting post (1m below ground) and ground socket for easy removal. Also provision for rotator mount.

£695 FREE Mainland Delivery

8m Tiltover Tube Mast Wall Mounted

This is a great mast for those who want to get just above the roof top and not upset the neighbours!

£350 FREE Mainland Delivery

bhi DeskTop

Noise reduction products

NEW

- High Quality Desk Speaker
- 4" Bass & 1" Tweeter
- 10W output
- bhi DSP Noise cancelling unit
- Side DSP controls
- Accepts stereo or mono input
- Feed with line or speaker levels
- Requires 12v - lead included
- Hear the difference

£179.95 c

YAESU

FTM-400DE NEW

The New Dual Bander 2m & 70cms 50W Digital / FM

High visibility colour screen with bandscope, altitude and navigational screens. Enjoy both digital and FM. Available now! **£539.95c**

VX-8DE

6m /2m/70cm

The VX-8DE TNC APRS/GPS provides an economical opportunity to obtain a handheld dedicated to APRS on all bands. This radio includes wideband receive 500kHz - 999MHz, Bluetooth option, IPX7 waterproof rating, includes AC charger and LiON 7.4v 11mAh battery pack.

£349.95c

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

RR/4010/SC	RIGrunner 10-way and connectors + Master switch	£146.95 C
RR/4010/S	RIGrunner 10-way with audio warning	£129.95 C
RR/4012/C	RIGrunner 12-way AF warning and connectors	£129.95 C
RR/4012	RIGrunner 12-way with audio warning	£112.95 C
RR/4008/C	RIGrunner 8-way AF warning and connectors	£121.95 C
RR/4008	RIGrunner 8-way with audio warning	£104.95 C
RR/4008H/C	RIGrunner 8-way and connectors (Horizontal)	£112.95 C
RR/4008H	RIGrunner 8-way (Horozontal)	£95.95 C
RR/4005/C	RIGrunner 5-way and connectors	£79.95 C
RR/4005	RIGrunner 5-way	£66.95 C
RR/4005H/C	RIGrunner 5-way and connectors (Horizontal)	£79.95 C
RR/4005H	RIGrunner 5-way (Horizontal)	£66.95 C
RR/4004U/C	RIGrunner 4-way, 12 connectors dual USB	£89.95 C

Buddipole Portable Antennas

NEW LOW PRICES!

W3-BP	40-2m dipole with balun	£189.95
W3-BP Dlxe	As above plus support system	£369.95
Tripod	Needs W3BM	£91.95
W3BM	Telescopic mast 8ft	£61.95
W3TRSB	Triple Ratio Balun	£98.95
W3-BS	Buddistick 40m - 6m	£139.95
W3-CTA	Centre mast adaptor	£8.95
W3-BS-TRI	Tripod for Buddistick	£29.95

ICOM IC-7100E Exclusive W&S

Get FREE (List £139) InnovAntennas Dual Band 4m/6m 6 El. Yagi

All for £1249 d *Offer Expires 20th July*

WATSON MultiRanger-9

Back in stock - one of our most popular antennas. Covers 80m to 2m (not WARC Bands) and is great for mobile or portable operation (with a ground plane). Fitted PL-259 base, it is remarkable value. Band changing is achieved simply by means of a wander plug and the top section can be tuned for fine adjustment.

£59.95

Signal Link USB

In Stock!

£99.95

- *Built-in Low-noise Sound Card
- *Simple Installation and Setup
- *Complete Radio Isolation
- *USB Port Powered
- *Works with virtually ALL Radios
- *Uses Mic, Data, or Accy. Port

This data interface matches virtually any soundcard based software, and is USB powered. Supplied with lead to match your radio.

DV-ACCESS 2m / 70cm

The DV Access Point Dongle connects to your PC or Intel based Mac via a USB port and provides a 2 meter Or 70cms Access Point for use with a D-STAR radio

DC-ACCESS 2m	£239 c
DV-ACCESS 70cm	£249 c

DV Dongle

Provides encoding and decoding of compressed audio using the DVSI AMBE2000 full duplex vocoder DSP chip. AMBE technology is used in all D-Star radios to provide efficient voice transmissions **£179 c**

FT-450D HF-6m 100W

Price Down!

One of the most popular HF transceivers with built in ATU at a new incredible price. Don't miss out! **£699c!**

Handheld Transceivers

YAESU

FT-252 2m Handy £69.95c

Genuine Yaesu Genuine Quality!

- 144-146MHz
- Rx 139-174MHz
- Loud 800mW Audio
- Tx 5W, 2W and 500mW
- CTCSS & DCS Tx & Rx
- 9 DTMF Auto Dial Memories
- 1Ah Li-ion Battery & Charger

VX-3E	2m/70cm Handy Wideband receive	£129.95c
VX-6E	2m/70cm handy, Wideband Receive	£179.95c
VX-7R	Triple band handy silver/black	£289.95c
VX-8DE	6/2m/70cm Upgraded APRS	£349.95c
IC-E80D	2m/70cm D-Star GPS ready	£299.95c
IC-E92D	2m/70cm + D-Star	£379.95c
TH-F7E	2m/70cm + wide receive inc. SSB	£236.95c
TH-D72E	2m/70cm GPS & TNC + SiRF	£426.95c
TG-UV2	2m/70cm with CTCSS DCS	£84.95c
KG-UV6D	2m/ 70cm 5W/4W SMA	£94.95c

NEW

ICOM ID-51E 2m/70cm

- *Dual Bander*
- *Simultaneous Dual Rx*
- *D-STAR DV*
- *Integrated GPS*
- *AM/FM Broadcast Rx.*
- *Submersible Construction*
- *Voice Memory recorder*
- *MicroSD Card Slot*
- *1304 Memory Channels*
- *Rapid Charge DC Power Jack*

£409.95c

TS-590S 160-6m Transceiver

Get A FREE MC-60A Base Mic £1249.95 d

Kenwood has won the admiration of the radio press and hams all over the world. It is probably one of the best transceivers that Kenwood have ever produced. The best dynamic range in its class, digital IF, narrow roofing filters and auto ATU. Also FREE PC control program that can be downloaded. Exceptional value.

IC-9100 HF - UHF Transceiver

The Icom IC-9100 is ideal for the operator who is looking for a complete high performance radio that covers HF - UHF in one box. It offers 100 Watts output on all bands up to 2m, whilst on 70cms you get a healthy 75 Watts. An internal auto ATU is included which covers HF plus 50MHz. IN STOCK **£2899.95 D**

KENWOOD TS-2000 160-23cm *

A base station that does everything. All modes, 160-2m 100W, 70cms 50W and 23cm (option) 10W. This fine radio has stood the test of time. **£1549.95c**

IC-7600 HF Transceiver HF - 6m

Dual DSP and three roofing filters. 3 , 6 & 15kHz
Double conversion superhet - super image rejection
Display 5.8" with ultra wide viewing angle.
Real time spectrum scope - USB for flash card or keyboard. 104dB dynamic range for great receiver performance
IN STOCK £2999.95c

AR-8600MKII Base/Portable

This base or portable station receiver covers 530kHz - 3GHz. All modes AM FM FMW & SSB with standard rotary tuning. The ideal general coverage station receiver. Every Ham radio station needs a means of monitoring the signal that is being transmitted. We think that this is the one. **£599.95c**

NEW

FG-01 MkII Antenna Analyser

The new FG-01 antenna analyser that covers up to 72MHz with larger screen. This highly portable unit features dual impedance and VSWR traces with colour screen. (Matching AC charger/PSU & Batt. Pack optional). **£239b**

Fast Antenna Adjustments

Yaesu FREE GIFTS

Buy any of the rigs below and you get a free remote head kit. Limited stocks so Hurry!

FT-857D Get FREE YSK-857 Remote kit
FT-8900R Get FREE YSK-8900 Remote kit
FT-8800 Get FREE YSK-8900 Remote kit
FT-7900 Get FREE YSK-7900 Remote kit

WANTED DEAD OR ALIVE!

We will accept any ham radio equipment in part exchange, even non-working items in many cases.

Just a Phone Call Away! 01702 203353
email: sales@wsple.com

Mobiles

TM-281E Latest 2m FM 65W mobile. Superbly built **£169.95c**

FT-8800E Dualband Mobile 50W / 30W Great Value **£279.95c**

FT-2900E 75 Watt 2m 3W Audio, CTCSS, DTMF mic & "WIRES" internet. **£149.95c**

FT-7900E 2m/70cms mobile 50/40W CTCSS, DTMF, internet, wide Rx **£219.95c**

FT-8900R Quad band 10/6/2m/70cm FM 50W (70cm 35W) **£299.95c**

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

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

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

FTM-350AE 2m/70cm Mobile Bluetooth GPS APRS **£399.95c**

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

Add A Quality Dash-Board Speaker!

SP-170F * 8 Ohms * Power rating 1.5W * 3m of lead with 3.5mm jack * Size 97 x 67 x 27mm * Weight * Filter & Vol. Control **£12.95b**

SP-180A 6W Amplified Speaker 6W * Gain and on/off control * 12V DC cigar plug, bracket, audio lead with3.5mm plug. **£20.95b**

HF - UHF Compacts - One Box! GREAT PRICES

YAESU

FT-897D base or portable. This 1.8 - 440MHz transceiver is great value. 1.8 - 50MHz 100W 2m 50W 70cm 20W. **£729.95c**

FT-857D The great value mobile or base HF-6m 100W, 2m 50W 70cm 20W. **£679.95c**

WATSON HF-VHF Mobile Whips

MultiRanger 9 £59.95c

- 80 - 2m non WARC
- Impedance: 50 Ohms
- Power Capacity: 120 Watts
- Connector: (PL-259)
- Length: 1.9m Max

MultiRanger 2000 £79.95c

This antenna is the same as the MultiRanger 9 but adds the WARC bands of 30m, 17m and 12m, 200Watts

HF on a BUDGET!

YAESU

FT-450D HF - 6m 100W transceiver. Includes Auto ATU Amazing value and a best seller. **£699.95c**

IC-718 SSB CW 100W from 160m-10m. You won't find a more cost effective HF radio! **£594.95c**

ICOM

ICOM

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

KENWOOD

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

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

WATERS & STANTON

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Spa House, 22 Main Road, Hockley, Essex SS5 4QS
Phone: (+44) 01702 206835 or 01702 204965
FAX: (+44) 01702 205843
Email: sales@wsplc.com
Opening: Monday - Saturday 9am - 5.30pm

Scotland & Northern Store

W&S @ Jaycee, 20 Woodside Way, Glenrothes
Fife KY7 5DF
Phone: (+44) 0845 5050128
FAX: (+44) 01592 610451
Email: jayceecoms@aol.com
Opening: Tuesday - Saturday 9.15am - 5pm

Web: www.wsplc.com
Blog: blog.wsplc.com

VISA MasterCard PayPal

MFJ £279.95

The new MFJ-259C now has added features. It is the handheld answer to antenna problems. Switch it on, connect to your antenna, and adjust the antenna for optimum performance in minutes - not hours!

- 530kHz - 230MHz No Gaps
- Digital and Analogue VSWR & Impedance.
- Frequency Counter
- RF Generator
- Measure RF Losses
- Add loop to make it a Dip Oscillator
- Measure Coax length
- Construct Stubs
- Find Coax Short Circuits
- Measure Reactance - and More!

MFJ-259C

Get on All Bands with an MFJ ATU

Top section can be any length, but try for near half wave length on lowest band of operation.
ie. 50 -66ft for 40m upwards

The feeder is balanced line, 300 Ohm or 450 Ohm. Once again you can use any length.

MFJ ATUs are the perfect way to create a simple, all band dipole. Most models are now fitted with a balanced output - both manual models and auto models. So build yourself a simple "doublet" as shown above, and take the balanced line directly into your MFJ ATU. No need for any external balun or traps. Then simply adjust the tuner for a perfect match on all bands from the lowest upwards. No band restrictions and no VSWR problems at band edges. You can move around with ease. A perfect match for your transceiver on any band. Try it and see for yourself. Peter G3OJV.

We stock almost every MFJ item and are Europe's largest dealer. So on no matter what you need, give us a call - we will probably have it for immediate despatch.

MFJ-269 HF-UHF Antenna Analyser

Isn't it time that you made antenna adjustments more quickly and more accurately? That's exactly what this analyser does. Improve your antenna performance and have full data information displayed.

* Freq Coverage 1.8-170, 415-450MHz
* Frequency Counter * LCD readout
* SWR & impedance or SWR Bargraph
* Coaxial loss meter * VSWR Meter
* Signal Generator * Freq Counter)

£399.95

MFJ-422D Bencher Keyer

Best of all CW worlds -- a deluxe MFJ/Curtis keyer in a compact package that fits right on the Bencher iambic paddle! Buy the combination or just the keyer for your Bencher or MFJ iambic paddles. £199.95

MFJ-854 HF RF Current Meter

This handheld device enables RF currents from 1mA up to 3 Amps to be measured. It is great for antenna adjustments. Maximum current in that long wire MUST be the optimum for your ATU.

MFJ-912 4:1 Balanced Line Balun

The famous W9INN 4:1 1.5kW balun is for feeding ladder line via coax cable. Two large insulators for ladder line and SO-239 for coax. loss. £76.95

MFJ-945E 300W 1.8-50MHz Coax

The small 8W x 2H x 6D inch black aluminum cabinet uses little room. The Cross-Needle meter shows SWR, forward and reflected power – at a glance £139.95

MFJ-971 1.8-30MHz Portable ATU

The MFJ-971 is ideal for portable work and as well as dual ranges of 30W and 300W, it is possible by changing an internal jumper to convert to QRP 6W or 30W FSD. Wire, coax or balanced. £119.95

MFJ-941E 1.8-30MHz 300W ATU

Here is amazing value. A cross needle meter, antenna selector switch, and the ability to match wire, coax and balanced feed. This makes a great base station tuner capable of up to 300W and has internal 4:1 balun. 12v illumination £164.95

MFJ-949E 300W HF ATU + Load

More Hams use the MFJ-949E ATU than any other model. Match any antenna. Wires, coax, balanced, plus 8-way antenna switch Large 3" cross needle and internal dummy load. £199.95

MFJ-16010 200W Wire Tuner

The MFJ-16010 is a variable L-network random wire antenna tuner designed to match the low output impedance of your transmitter to the high impedance of a random wire. Covers 3.5 - 30MHz. £65.95

MFJ-901B

The MFJ-901B is MFJs small and most affordable 200 Watt PEP Versa Tuner. Its designed to match virtually any transmitter (up to 200 Watts and can match coax and end fed antennas. £104.95

MFJ-986 1.5kW 1.8-30MHz ATU

Differential-T Tuner uses a differential capacitor making tuning easier. Broadband coverage ends constant re-tuning. A rugged roller inductor atu that handles 1500 Watts PEP SSB power and covers 1.8 - 30 MHz continuously. £359.95

MFJ-989D 1.5kW ATU

New and improved! The world's most popular legal limit antenna tuner just got better -- with no increase in price! You get better efficiency, lower losses, and a new true peak-reading meter. Easily handles full 1500 Watts SSB/CW, 1.8 to 30 MHz. £399.95

MFJ-962D 1.6kW ATU

The compact MFJ-962D handles 1500 Watts PEP SSB amplifier input power (800 Watts PEP SSB amplifier output power). Its perfect for Ameritrons best selling 800 Watt AL-811H or 600 Watt AL-811 amplifiers! £299.95

Tiny Tuner MFJ-902B

Tiny 4 1/2 x 2 1/4 x 3 inch tuner handles full 150 Watts! Covers 80-6 Meters, has tuner bypass switch, tunes nearly anything! Wire or coax. £104.95

MFJ-267 1.5kW Power Meter & Load

1.5 kW Dry Dummy Load has built-in precision, true peak-reading SWR/Wattmeter switchable to external antenna! Up to 650MHz £169.95c

MFJ-250X 2kW Dummy Load

The MFJ-250X VersaLoad KW Wet Dummy Load lets you tune up fast! You can run 1KW CW or 2 KW PEP for 10 minutes. Or run ½ KW CW or 1 KW PEP for 20 minutes. Requires oil £59.95c

MFJ-260C 300W Dummy Load

Every station should have a dummy load for testing and adjustment purposes. This one is our top seller and is available with SO-239 (C) or N (N) type sockets. It will handle up to 300W of power. £45.95c

MFJ-925 for IC-7000 & FT-857

MFJ-925 IntelliTuner™ specifically complements todays compact HF transceivers, such as the IC-706MKIIG, IC-7000, FT-857D, DX-70TH and TS-505. Operates from 2 - 200W £174.95

MFJ-991B 300W Auto ATU

First dual power level Tuner -- Select 300 Watt SSB/CW and match 6-1600 Ohm antennas Or select 150 Watt SSB/CW and match extra wide-range 6-3200 Ohms. New 10,000 VirtualAntennaTM Memories. Like MFJ-993B, less digital SWR/Wattmeter/ LCD display, audio SWR meter/ audio feedback, antenna switch or 4:1 current balun. £214.95

MFJ-998RT 1.5kW 1.8 - 30MHz

Weather-tight ABS plastic cabinet top with a stainless steel bottom. Send DC/RF down the coaxial line. Has MFJ's InstantRecall to see if that requency has been used before. If so, tuning is instantaneous. Measures 13 3/4W x 6 3/4H x 17 1/2D inches. It's the true fit and forget Auto ATU for those using linear amplifiers. £799.95

MFJ-994BRT 600W Remote ATY

As you're ragchewing, contesting or DXing, your MFJ IntelliTuner is learning! to operate in milliseconds! We've made this tuner to suit the UK market, so that those with linear amplifiers can enjoy the benefit of auto ATU. Includes coax DC feed. £449.95

MFJ-926B 200W Remote ATY

MFJ-926B Automatic Antenna Tuner covers the entire HF band and will match a random wire or coax-fed antenna 1.8 - 30 MHz at a full 200 Watts SSB/CW. Matches impedances 6-1600 Ohms (SWR up to 32:1). £299.95

MFJ-993RT 300W Remote ATU

The Remote IntelliTuner is mounted in a durable hard plastic case. Covers 1.8 to 30 MHz, has heavy duty 16 Amp / 1000 Volt relays and a highly efficient L-network. It also includes the MFJ-4117 BiasTee Power Injector to send DC/RF down your coax. £329.95

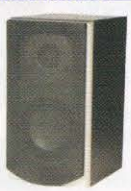
MFJ-927 200WRemote Auto ATU

Weather protected remote auto tuner for coax/ wire ant., includes MFJ-4116 Power Injector. Most MFJ-929 features, no LCD/buttons. This is a low cost ATU that will get you on all HF bands using just a single wire. £259.95

MFJ-402 Nano Size Paddle Key

t's a nano-size 2" x 3" x 1" and weighs just 3 ½ ounces! Speed adjusts 5-65 WPM, weight 25-75%, has lambic mode A or B, normal or "bug" mode and reverse. £72.95

MFJ-385B Base Station Speaker



The new MFJ base station monitor is designed to give the very best and articulate audio from your receiver or transceiver. You won't realise how restricted your internal speaker is until you plug this great unit into your radio. It improves intelligibility and is a great asset to any station. Size is 5 1/4Wx9 3/4Hx6 1/2D inches. £44.95

MFJ-914 Auro Tuner Extender

How often do you find that your internal auto ATU will not match your antenna? It's a common problem, particularly with the ever popular G5RV tuner. Most internal ATUs (other than Elecraft) struggle when the match demands are complex. This little device sits between your antenna and the transceiver. Simply select one of the positions on the front panel and enjoy a perfect match from your internal ATU. £89.95

MFJ-993B Auto ATU

One of our most popular auto antenna tuners that will match wire, balanced line and coax feeders. It not only tunes your antenna but also gives you a digital display showing characteristics of the matching.

- Automatically tunes unbalanced/balanced antennas
- 1.8-30 MHz with 4:1 current balun for balanced line
- .Now with 20,000 memories
- Antenna Switch and Efficient L-network design
- .Select 300 Watts (6-1600 Ω) or 150 Watts (6-3200 Ω)
- Digital SWR/Wattmeter Audio SWR meter
- Backlit LCD - Remote control port .- Radio interface £279c

MFJ-929 Fast Compact Auro ATU

200W handling matches a near perfect VSWR. Get the best from your antenna! £214.95

MFJ-998 1.5kW Auto ATU

*Full 1500 watts SSB/CW *Digital & Analog SWR/WattMeter *Ultra-fast, Safe Automatic Tuning *Wide Tuning Range (12-1600 Ohms from 1.8 to 30 MHz) *Built-in Antenna Switch for two coax/long wire *Automatic Bypass protects your amplifier *Field Upgradeable Software *Very Compact!

MFJ-901B HF ATU

£104.95

One of our most popular antenna tuners and offered at a very attractive price. It covers 1.8 - 30MHz and handles 200W. It is very versatile and handles end fed wires, balanced feeder and coax fed systems.

MFJ-928 Budget HF Auto ATU

Here's a great budget auto ATU that will handle up to 200W. Designed for coax feeder, it is a great way to add an auto ATU to your base station. £203.95

MFJ-4117 Bias T Voltage Feed

This unit is a great way to pass a 12v DC source down a coax kine. It is fitted with SO-239 sockets and operates up to 60MHz. You need two units - one at each end of the line. £33.95

MFJ-1118 DC Distribution Board

£88.95

Has two pairs of super 30A 5-way binding posts.. Fused and RF bypassed. Handles 35 Amps total. Six pairs of heavy duty, RF bypassed 5-way binding posts le: you power your accessories. They handle 15 Amps total.

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Contents

RadCom

THE RADIO SOCIETY OF GREAT BRITAIN'S MEMBERS' MAGAZINE

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

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 August edition of *RadCom* is expected to arrive with most Members by 28 July, although this can take up to a week longer in some cases; international deliveries can take longer still.**

Layout and design by Kevin Williams. Original concept by Imotea Creative Mediadesign.

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

News and Reports

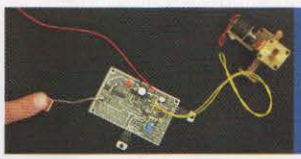
Reviews

Features

Cover image: New British 144MHz ARDF Champion Andrew Soltysik, G4KWQ receives the 144MHz Salver from RSGB President, John Gould, G3WKL

Photo: David Williams

Technical Features



Techniques for driving 24-28V relays from 12V supplies – P56

Regulars

146-147MHz Opportunity

Whilst spectrum release in the microwave bands presents a challenge due to loss of frequencies, in the VHF bands it represents an opportunity for new innovations and activity.

In a joint input, RSGB, BATC and AMSAT-UK have responded to Ofcom's latest consultation regarding available spectrum in the VHF bands and, in particular, the prospect of temporary non-interference based access on a NoV basis to 146-147MHz for Full licensees.

According to Ofcom, there would be geographic and power restrictions as these frequencies are not internationally allocated to amateur radio in ITU Region 1. Nonetheless, the proposal was welcomed in the submission, as the RSGB believe this represents an unprecedented opportunity for amateurs to experiment and develop new low-cost digital radio solutions supporting both voice and multimedia including video. Links for the Ofcom consultation and responses can be found on the RSGB website on the Spectrum Forum pages (http://rsgb.org/main/about-us/committees/spectrum-forum/papers-and-consultations/).

Contest Committee Consultation

As part of an initiative to consult with the contesting community over topics of mutual interest, the RSGB Contest Committee has published a 'white paper' containing eighteen proposals and suggestions for changes to the RSGB contest rules for 2015. Six of the proposals apply to both HF and VHF contests, eight apply to HF contest and the remaining four only apply to VHF contests. The white paper is available at www.rsgbcc.org/whitepaper2014.pdf

Comments on any of the proposals and suggestions are invited. All comments will be reviewed by the RSGB Contest Committee and the revised rules for all RSGB contests will be published by the date of the RSGB Convention in October – earlier if possible. The revised rules will take effect on 1 January 2015. Please send your comments to committee@rsgbcc.org no later than 14 August 2014.

Further information is available in the RSGB Contest Committee Newsletter, downloadable from www.rsgbcc.org/hf/newsletter/newscurrent.shtml

CC Newsletter

The latest edition of the RSGB Contest Committee newsletter has been published. Amongst the details in the newsletter are the updated results for the UK Activity Contest sessions and the 80m Club Championships. Other results include the Commonwealth Contest and the First 70MHz Contest. Other items of interest are arrangements for trophies in 2014 and information on the SHF UK Activity Contests.

If you would like to sign up for the Contest Committee newsletter, go to http://www.rsgbcc.org/cgi-bin/subscribe.pl?subtype=news

G5RP Trophy

The G5RP Trophy is an annual award to encourage newcomers to HF DXing. The award is not limited to youngsters or the newly-licensed; it is open to anyone who has recently discovered and made significant progress in HF DXing. The trophy was donated by members of the Vale of White Horse ARS in south Oxfordshire in memory of their late chairman Ted Wake, G5RP.

If you are an established HF DXer and want to recommend someone to be awarded the G5RP Trophy for 2014, now is the time to send in your nomination. Your nominee should be an up-and-coming HF DXer who has made rapid progress in the last year and has some real achievements to show, for example, a good total of new countries worked or some serious HF DXpedition activity.

Last year's winner of the G5RP trophy, Rob Chipperfield, M0VFC with RSGB President 2013, Bob Whelan, G3PJT.

This prestigious award will be presented this year at the RSGB Convention on 10-12 October.

Please send your nominations to Ian Greenshields, G4FSU, QTHR, or by e-mail to ian.greenshields@gmail.com to arrive no later than Friday 5 September.

July Gathering for Young Members

As you may have heard, the RSGB is organising a get-together for its young Members. The event will take place on the weekend of 19 and 20 July in Wolverhampton and will link up with the Youngsters on the Air event in Finland. We are therefore calling this YOTA UK.

The broad plan is to have a 'mini-convention' on the Saturday with activities linked to SOTA aerial building, satellite operating, receiver building, Intermediate practical work, a special event station and a barbecue. We also have a Direction Finding event planned for the Sunday with further opportunity to operate the special event station.

We would like to see as many of our young Members in attendance as possible and hope to make YOTA UK an annual event.

Full details of the programme are still being working on but if anyone would like further info, please contact Steve Hartley, G0FUW, via e-mail to tec.chair@rsgb.org.uk

Communications Officer for RSGB

The RSGB Board is pleased to announce the appointment of a Communications Officer. Heather Parsons will be taking up this part-time role later in the month. The role will include social media, the mainstream press and liaison with the Regional teams and radio clubs.

Ofcom Licence Review

The RSGB understands that Ofcom will publish the long-awaited consultation paper by the end of June. The proposal will feature in the next edition of *RadCom* and the Society will be conducting discussions on the proposals using the Forum on the RSGB website at http://forums.thersgb.org/index.php.

Chair for the Spectrum Forum

With the current Chair of the Spectrum Forum having taken on the role of RSGB President it is appropriate for him to stand down in order to concentrate on the wider external representational role, in which he plans to continue to be able to play an active part in spectrum management matters. The Society is therefore seeking nominations for this vacancy.

Candidates should have experience in spectrum management matters, good communication skills and ideally good working relations with the groups represented on the Forum. As with all positions within the Society the successful applicant will be required to subscribe to the Society's Code of Conduct and Ethos, which is detailed on the RSGB website.

Candidates should apply with a short CV to Graham Coomber, GONBI, RSGB General Manager, by 7 July, via email to graham.coomber@rsgb.org.uk.

QSL Matters

Last month, we reminded visiting members to lodge collection envelopes with the appropriate sub-manager. This is harder to do for those venturing to islands such as Jersey, Guernsey or the Isle of Man. UK mainland stamps are not acceptable and the best advice is to buy stamps before returning home so that the QSL Managers for those locations can post your envelopes to you.

For those QSLing direct it's always a good idea to keep an eye on the IARU website as overseas bureaus often change locations. The W9 QSL Bureau has a new address: PO Box 91, Wilmette, IL 60091, USA.

Some changes to QSL managers' e-mail and postal addresses have taken place this month for the 2M, M5 and G4S-G4U groups. Please check the RSGB website under the Operating heading for details.

The GM5-8 manager, Mike Clark, GM6OFO, is retiring after more years than he cares to remember. Mike has been a stalwart member of the team and will be missed and the RSGB board would like to thank him for his service to the hobby. Tom Wylie, GM4FDM, has kindly agreed to take on a little more and now covers GM4-GM8.

Visiting the NRC & BP

RSGB Members are now entitled to free admission to the world famous Bletchley Park heritage site and tourist attraction – as well as entry to the RSGB National Radio Centre – on production of a voucher. So far 76 Members have downloaded vouchers. To obtain your voucher click the Get My Voucher button on the RSGB website (http://rsgb.org/main/myrsgb-2/bletchley-park-free-admission-voucher/) and fill out the simple form. Please note on clicking the button you will be prompted for your RSGB membership login to complete the voucher application form. Your RSGB Membership number is printed on the wrapper of *RadCom* each month.

RSGB Members may visit on any day the Bletchley Park site is open to the public but please note that the NRC radio station is only operational from Wednesday to Sunday and bank holidays.

Club of the Year

The Region 12 Centenary Club of the Year trophy was presented to members of the Hilderstone Amateur Radio and Electronics Club by the sponsors, Waters and Stanton, during their Open Day event on 25 May. Peter Waters and Jeff Stanton presented the shield and a bottle of champagne to Len, G0GNQ, David, G8GJQ and Charles, MORST. RSGB Region 12 Manager Steve, M1ACB was there to congratulate the winners on their achievement. Hilderstone AREC chairman Ron, G7OHO was unable to attend the event, but hopefully he will get to share the champagne.

Archives

The RSGB library is looking for issues of the *T & R Bulletin* between 1925 and 1939 so these issues can be scanned. There is a full set of bound volumes in the library but scanning at high quality would risk damaging the bindings. The library and archive are always interested in other historic paperwork such as photographs, logbooks, letters, notebooks, technical books etc; please send details to elaine.richards@rsgb.org.uk with details.

Membership Services

As part of the RSGB Board policy to improve the Society's service to Members, Regional Managers and DRMs have been telephoning new Members who signed up for the Centenary Membership offer to see how their Membership is working. These efforts are being joined by RSGB Board Members and Board Chairman, Graham Murchie, G4FSG said, "several Members have been specific with the thanks and appreciation for the calls they have received. I even had one Member say that he thought all the RSGB people just sat in committees and didn't speak to the Members and was particularly appreciative of the call". He and his fellow Board members are encouraged by the response from the new Members.

Apologies

Gremlins got into the June edition of *RadCom* and caused some errors. On page 7 in the Joiners and Rejoiners section, the date should have read 2013 and not 2103. In the AGM report on pages 14-15 some callsigns got scrambled and are corrected here: David Crowe is G4MVU, Ian Brothwell is G4EAN, Charlie Suckling is G3WDG and Rob Ferguson is GM3YTS. We apologise to all for the confusion and mistakes.

CONGRATULATIONS

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

60 Years

Mr M Pharaoh	G3LCH

50 Years

Mr B J Whitty	G3HWX
Mr C R Bonner	G3TGF
B R G Hutchinson	G3VGH
Mr R Volck	GW3RKV

Dayton Hamvention 2014

The RSGB would like to thank the following Members and friends who visited the RSGB bookstall at the recent Dayton Hamvention. This year the weather was unpredictable and gave visitors several drenchings! It was also the 100th anniversary of the ARRL and staff members attended the 'cake-cutting'; congratulations to them. The RSGB hopes they enjoy their Centennial convention and dinner later in July as much as the RSGB enjoyed its centenary in 2013.

A71BA	K0WFS	KQ1X	VO1AU	WF8E
AA0MZ	K1FJ	KV0S	W3HTJ	WG8S
AA3XV	K1OYB	KW6A	W3IV	
AB4U	K3FT	M0CFW/JK3GAD	W4RA	
AB8RG	K4PHS	MW0ZUS	W5JCS	
AC0XE	K4SSM	MW0ZUS	W5QR	
AC2JL	K4SV	N0AXZ	W8CI	
AG4VF	K6KLY	N0UU	W8MOU	
G0DWV	K7RE	N3SB	W8OJM	
G0TSH	K9DDB	N4NX	W8TJK	
G2KQ	K9TGR	N5WNB	W8WG	
G2YL	K9TRV	N8BI	W9IGY	
G3KEL	K9VB	N8CBW	W9SWW	
G3RBP	KA0HMQ	N8GFO	W9WI	
G3UYN	KA0IQT	N8GZL	W9ZD	
G3YSX	KA8MMI	N9SJA	WA0EMX	
G4CEP	KB8V	NB9J	WA2ARS	
G4DDN	KB9RDN	NI50	WA5FLT	
G4DSE	KC3BDF	PY2DM	WA8LHB	
G4GXL	KC8QFF	VA3TM	WB0W	
G4LUE	KD8BPY	VE3CRG	WB2DCL	
G4PEW	KD8UYT	VE3EI	WB2KHO	
G5KC	KI4YDG	VE3KID	WB5OYP	
G6GIY	KL0QD	VE3LC	WB6QZU	
G7FBD/KG7FBD	KM4CH	VE3NJK	WB9SIS	
GI4GUH	KM4FO	VE3OKK	WD8DRM	
GM0XAV	KN2I	VE3OOI	WD8MRT	
GW0NVN	KO8TIZ	VE5ERQ	WD8NVN	

WWI goes to Sussex

The BBC will mark the centenary of World War One with events running from 2014-2018. This summer, as part of the season, BBC Learning will create eight large-scale inspirational Great War events that will take place throughout the UK, reflecting the dramatic impact the war had on local families and communities.

The BBC WWI at Home event went well at the Suffolk Show says Steve, M1ACB, Region 12 Regional Manager. He was attending the event with Leiston ARC who were helping with the popular Morse Code activity. Lots of youngsters were introduced to Morse Code and some great conversations took place with them, their parents and grandparents.

Dave Powis, G4HUP was interviewed live on BBC Radio Suffolk where listeners were invited to call in if they understood the code he sent. Five listeners heard and correctly copied the Morse before making their calls to the radio station.

The BBC have a short piece about the whole event at www.bbc.co.uk/news/uk-england-suffolk-27604981

Joiners and Rejoiners

Last month we inadvertently gave Dr M Williams, GOEGA the incorrect title, for which we apologise.

NI DRM Silent Key

The Deputy Regional Manager for Region 81, Melvyn Irvine, MI0MSR, passed away suddenly while attending his local club, Bushvalley ARC. Melvyn was a faithful member of the Region 8 team and was well known as Jim Bob's side kick at many rallies the length and breadth of the country. He was the chairman of Bushvalley ARC in Bushmills, Co Antrim as well as a member of Ballymena ARC. He was also a member of the Training and Education Committee. Melvyn mostly used PSK and data modes on the air and will be much missed for his helpful ways – and, according to other club members, his story telling too. The RSGB would like to send their condolences to his wife and family as well as his many amateur radio friends. Our thoughts are with them at this difficult time. The RSGB was represented at his funeral by the Region 8 Regional Manager, Philip, MI0MSO and DRM 82, Bobby, MI0RYL. It well attended by the amateur community.

Building a Transceiver

By Eamon Skelton, EI9GQ & Elaine Richards, G4LFM

Home construction is alive and well amongst the ranks of today's radio amateurs and *Building a Transceiver* brings to life how making something as complex as an HF transceiver can be achieved with very simple equipment and techniques.

One of the benefits of building your own transceiver is that you will understand how it works and then you should be able to fix it or improve it in the future. *Building a Transceiver* is based on the relatively complicated HF transceiver project that has been broken down in to smaller modules that can be built and tested individually. Each module is described in cookbook fashion so that the constructor understands how it works before starting the build. The constructor may choose to build a complete transceiver based closely on this design, add in some of your own modules or you may prefer to mix and match by using parts of this design and integrating them into a completely different project. This modular approach means that you could, for example, take the VFO design and adapt it for use as a signal source in test equipment.

Building a Transceiver is based on the hugely popular 'Homebrew' column in *RadCom* written by Eamon Skelton, EI9GQ. Readers will find that the book covers the detailed electronic design process and practical constructional techniques necessary to build the transceiver. Most modules are in the dead-bug construction style and this is fully detailed along with a number of other useful techniques. Photographs are also provided to help the reader visualise the final layout of each section. Each element of the transceiver is described fully with details of components and any board layouts available.

You may never build the complete transceiver described in this book but the construction techniques and testing has been designed with the resources of an amateur radio shack in mind, so will be useful whatever your level of experience and whatever you decide to build.

Size 174x240mm 176pages ISBN: 9781 9101 9301 3
Non Members' £12.99
RSGB Members' £11.04

World War One Events

The BBC will mark the centenary of World War One with events running from 2014-2018. This summer, as part of the season, BBC Learning will create eight large-scale inspirational Great War events that will take place throughout the UK, reflecting the dramatic impact the war had on local families and communities.

The WW1 At Home Live Events will also help people to explore their own relatives' links to the war. The family-friendly events will include hands-on activities, performances and interactive sessions. People can also learn about how medicine and communications were transformed during the war, including demonstrations of how carrier pigeons were an invaluable resource for sending messages. Several amateur radio clubs are taking part in these events with special event stations or hands-on Morse demonstrations for visitors. Keep an eye on the RSGB website for details.

Dates and locations
June 28: Woolwich Great Get Together and Armed Forces Day
July 12 - 13: Wolverhampton, Wolverhampton & Black Country Show
July 26 and 27: Sunderland International Airshow
August 1, 2: Dundee, City Square
August 8 - 10: Bristol International Balloon Fiesta
August 30 - 31: Rhyl Airshow, Rhyl, Wales
September 6 - 7: Portrush, Co Antrim, Air Waves Portrush
September 19 - 20: Nottingham, Nottingham Fields of Battle Exhibition

Antarctic Commemoration

In July of 1914, Sigurjon traveled from Gimli, Manitoba, Canada to England to deliver 100 Canadian husky dogs to Sir Shackleton for his Imperial Trans-Antarctic Expedition. VE4XSI will be commemorating the contribution Sigurjon Isfeld made to Shackleton's expedition with a special event station and QSL card.

This special event station will be operational from Gimli, Manitoba from 26 July to 4 August as operator conditions dictate. Look for the station on 7.2, 14.250, 21.250 and 28.350MHz as band conditions allow. For more information, check out VE4XSI on QRZ.com.

Victoria Cross Event

Causeway Coast & Glens ARC will be holding an on the air event from 1 to 7 July to help raise funds for a memorial or statue to commemorate Rifleman Robert Quigg who won a Victoria Cross on 1 July 1916. It is hoped that enough funds can be raised to have the memorial/statue erected in Bushmills in time for the upcoming 100th anniversary. The bands and modes planned, propagation permitting, will be 10m, 12m, 15m, 17m, 20m and 40m phone and digi modes PSK31, JT65 etc. There will also be a Special Activation Day from 10.30am at Dunderave Playing Fields, Bushmills on 5 July when there will also be a car boot sale (£5 per car). Everyone is welcome including fellow operators to help take the microphone.

Boat Lifts OTA

A seed of an idea was germinated in the Mid Cheshire Amateur Radio Society one spring evening during a conversation between members. They were discussing how important inventions and structures from the past were being forgotten, especially from around the age of the industrial revolution. The Mid Cheshire club is close to such an understated, but important, historic site – the Anderton Boat Lift. Enquiries were made to clubs all around Europe to see how many were in a similar location with radio clubs close to boat lifts, expressing an interest in taking part in an event. It was apparent from the responses received that idea was popular one, and Boat Lifts On The Air was born.

The inaugural event will take place on 14 September using the 40m band primarily for SSB, the 30m band primarily for data and CW and the 20m band as secondary for all modes

So far, four radio stations at boat lifts have confirmed for the event. These are the Anderton Boat Lift, Rothensee and Henrichenburg boat lifts in Germany and the Eblag boat lift in Poland. Radio clubs near other boat lifts such as Falkirk and Scharnebeck have also expressed an interest in participating and the Mid Cheshire club are hopeful that at least one of these will take part. It is likely that special event callsigns will be evident – the Anderton Boat Lift will be using GB0ABL – with QSL cards depicting the relevant boat lifts.

The MIDCARS station site, at the Anderton Boat Lift, will be open to the public where members will be able to meet and greet the public and explain what they are doing, and why, as well as show amateur radio in action. All are welcome and encouraged to visit and take part in the event.

For up-to-date information, news, maps, and your comments, suggestions etc please see www.boatliftsontheair.com – the site is being continuously updated.

WWI Special Event

The First World War was declared at midnight on 4 August 1914. The Admiralty alerted the Royal Navy and, at the same time, instructed Poldhu to inform merchant ships. This they did using their callsign ZZ (the specific callsign for merchant and passenger ships). A copy of the message sent from Poldhu and received on board the SS Calgarian was found in the Radio Officers Association archives and clearly shows it was received from station ZZ.

The Radio Officers' Association represents former seagoing, coast station and civil aircraft Radio Officers. They applied to Ofcom for the special call sign GB100ZZ to recognise the sacrifice made by more than 1000 wireless operators who lost their lives from both sides of the conflict.

Ofcom have agreed that the Marconi

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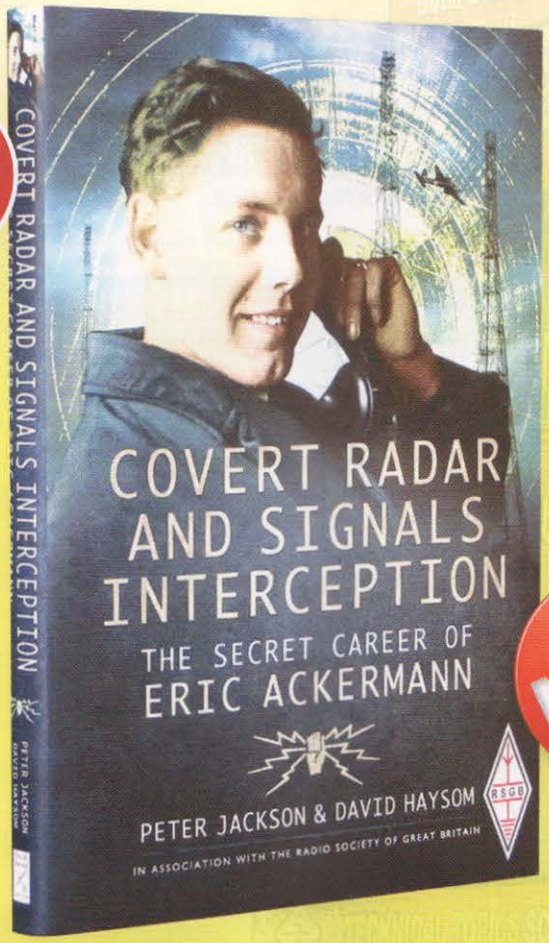

NEW

Covert Radar And Signals Interception

The Secret Career of Eric Ackermann

By Peter Jackson & David Haysom

Few know the story of Eric Ackermann who became a leading figure in the world of signals and electronic intelligence during WWII and beyond. This book seeks to explain his activities during the war and the subsequent Cold War activity.

Covert Radar and Signals Interception explores the various highs and lows of Eric's role at the vanguard of tactical intelligence operations where he saw conflict up close and personal. Winner of the George Medal for conspicuous gallantry, Eric had an extraordinary wartime career that included over 40 bomber flights assessing the enemy's radar capabilities. He was also involved in searching for, monitoring and destroying Germany's *Wuerzburg*, *Knickebein* and *X Band* radar systems, and a host of secret missions carried out in North Africa, Gibraltar and Italy. His research was passed to the highest levels of wartime government, and was highly prized. The end of the war did not signal the end of Ackermann's role. He was to play a major part in the setting up and implementation of a string of listening stations built along the borders of Soviet Bloc countries. Further work in aeronautics and satellite construction in the United States followed. Despite the might and scale of his achievement, this leading figure is relatively unknown and this book seeks to rectify that as well as provide new insights into intelligence practices and their often far-reaching consequences.

Covert Radar and Signals Interception is a highly illuminating and thoroughly recommended read.

Hardback. Size: 160x240mm, 224 pages
ISBN: 9781 7834 6268 1
Non Members' Price: £19.99
RSGB Members' Price: £14.99 (25% off)

25% OFF RSGB Members

Radio Society of Great Britain **www.rsgbshop.org**
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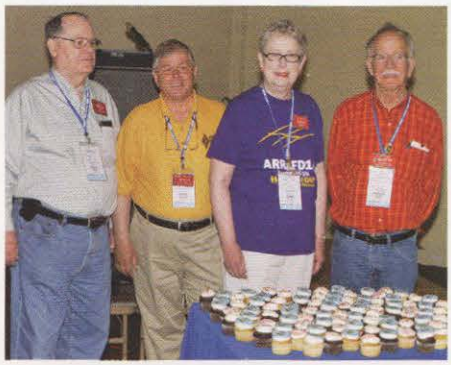
Centre at Poldhu can use the special callsign GB100ZZ from 3 to 30 August. The high powered station at Poldhu used ZZ to send safety messages to merchant and passenger ships as well as the daily news and weather service.

While the numbers of wireless operator casualties was very small in comparison to the total losses we have to remember that wireless played an important part in the war both on land, at sea and in the air even though wireless was still in its infancy.

ARRL 100th Anniversary

The Dayton Hamvention took place from 16 to 18 May and Sunday the 18th was a special day: it was the 100th anniversary of the ARRL's founding. A birthday party and free cupcakes helped to draw a room-filling crowd of 200 or more for the Sunday morning occasion. ARRL President Kay Craigie, N3KN, said that whilst we look back with respect on what those early amateurs had achieved, the second century is up to us. She hoped that in another 100 years, those future amateurs would look back at us with a similar respect.

The League also has a 3-day celebration in Hartford, Connecticut from 17 to 19 July where visitors can expect forums, exhibits, a flea market, banquet, keynote speeches and more. The RSGB will be represented by the President, John Gould, G3WKL, and there will be an RSGB bookstall.



When all else fails...

Wallace, WW4MSK was recently working maritime mobile and the internet access failed on his vessel. They were running late and he needed to get a message to his wife and others about the delay. The loss of contact via internet would have been a concern too. To get a message to his wife, he reached G1OCN and he gladly copied and relayed the message to Wallace's wife. Wallace told the RSGB that if she had not received the message there would have been unnecessary worry and possible initiating of search for our vessel. He would like to thank G1OCN for his assistance.

Commonwealth Games

To commemorate the Commonwealth Games being held in Scotland this year, members of The Worked All Britain Awards Group will be activating an event station each day from 23 July to 3 August from various locations in Scotland.

An award will be made available for working the station on 3, 6 or 9 different days during this period, which will be endorsed Bronze, Silver or Gold respectively. Awards may also be endorsed for any band or mode. More than one certificate may be claimed if applying for different bands or modes. These certificates will reflect the highest stage achieved for that endorsement.

For full details please see the WAB website www.worked-all-britain.org.uk

All proceeds from this award, priced at the usual WAB rates of £2.50 including postage for a printed certificate, or £1 for a pdf version, will be donated to ARCOS, a UK national charity, working to improve life for children and adults who have communication, eating, drinking and swallowing difficulties.

50 Years of Moonbouncing

In the July 1964 edition of *Radio Communications* it was announced:

"At 20.20 GMT on June 13, 1964, G3LTF at Galleywood, Essex, and KP4BPZ in Puerto Rico, made contact on 430Mc/s by bouncing their signals off the moon. Signal reports were RST459 both ways. A further contact took place one hour later.

"KP4BPZ was fortunate in having the 1000ft radio-telescope dish aerial at Arecibo, Puerto Rico at his disposal. G3LTF's equipment included a 15ft dish aerial and an AF139 transistor pre-amplifier for reception. Power input to the PA was 150 watts."

The photograph shows Peter, G3LTF's home-built 15ft wire-mesh and wood dish used in July 1964.

This was the first time that amateur signals from the UK had reached other parts of the world by bouncing signals off the moon (also known as 'moonbounce' or EME, earth-moon-earth). What is more remarkable is that Peter Blair, G3LTF is still active on moonbounce, regularly working many stations on the 70, 23, 13, 9 and 6cm bands. Peter remains one of the world's leading pioneers, having now worked more than 50 different stations on 6cm (5760MHz) EME.

The RSGB offers Peter, G3LTF its heartiest congratulations on this 50th anniversary of his achievement.

Peter, G3LTF's first 432MHz moonbounce QSO was followed the next day by a QSO between G2HCG and KP4BPZ.

Today moonbounce communication is practiced by many amateurs in the UK from 50MHz to 24GHz. This increasingly popular aspect of the hobby was highlighted in the article An Introduction to Moonbounce published in the February and March 2014 editions of *RadCom*.

BYLARA celebrates

On 29 April 1979, the British Young Ladies Amateur Radio Association was formed at Drayton Manor Park. Thirty five years later, BYLARA decided to mark the occasion using GB35BYL. A small group of YLs, and some supporting OMs, met at Chapmanslade Village Hall, near Frome, to contact as many stations as possible during the day. The QSO Party attracted over 300 calls from around the world, with many YL operators calling in.

The team consisted of Carol, 2E1RBH and Rob, G0RYL; Jenni, M0HZT and Merfyn, M0HWA; Judith, G4IAQ and Dave, G4IAR, Tracy, M6TEP and Hazel, G7RGI.

They had glorious sunshine all day, despite a gloomy forecast for thundery showers, and were most grateful. They would like to thank the local club, who donated a tent, mast and 40m dipole. At the end of the day, a 35th birthday cake was cut by Carol and was shared by all. At the same time, a separate BYLARA expedition was activating the island of Scalpay using GB2SOH. The members of that team were Elaine, 2E1BVS, Val, G6MML, John, G3WFK and Glenn, G6HFF.

The next celebration will be at the national Hamfest where they plan to have a 'party' in one of the conference rooms and all YLs are invited (as well as any who like to support them, of course). www.bylara.org.uk

Ian Thomson, GM0URD • e-mail: ian@thomson1259.orangehome.co.uk

The Sky-Painter

A 40m field day antenna support system

INTRODUCTION. As is quite common these days, I have a small garden and wanted to construct a simple yet practical dipole antenna for 40m that would be suitable for home use and would also fit into the back of my small car for use in field day events. This had to be constructed from locally obtainable DIY components at relatively low cost. I settled on two Watson WHF-40 single band mobile antennas mounted horizontally with a home-made support and fed via a balun. **Photo 1** shows a general view of the antenna fully erected. The name Sky-Painter came about because the mast section consists of a paint roller extension pole, fitted on the top of a window cleaner's fibreglass telescopic extending pole.

GENERAL DESIGN. The two WHF-40 aerials are mounted back-to-back on separate mounts, forming a dipole. The mounts are bolted to each other so that they clamp onto the window cleaner's pole that forms the mast section, as shown in **Figure 1**.

In order to keep the WHF-40 aerials horizontal without putting excessive strain on the mounts, a system of guys is employed, dropping down from the top of the (extended) mast. Windage would also cause stress so an additional horizontal guy system is employed. These are both shown in **Figure 2** and described in more detail later. In Photo 1, the anti windage rods appear silver and the loading coils are black. The guys run down from the 'handle' at the top to the ends of the loading coils.

In order to reduce current flow on the outer of the coax, a balun is included immediately before the feed point. This consists of five turns of coax looped through two glued-together ferrite rings, the whole of which is mounted on a kitchen food cutting board, which can be seen in **Photo 2**. **Figure 3** shows the electrical arrangement of the balun.

The base section is constructed from a modified, folding work bench, to which the fibreglass mast section is attached. **Photo 3** shows the whole Sky-Painter folded up ready for transport.

The centre of this pole has a hollow hexagonal plastic section, which protects the coax. The coax goes up through the centre of the mast and out through a grommet in the centre of one of the antenna element support brackets. This bracket had to be modified slightly by drilling out and rounding

PHOTO 1: General view of the fully erected Sky-Painter portable 40m dipole antenna.

PHOTO 2: Detail of the balun.

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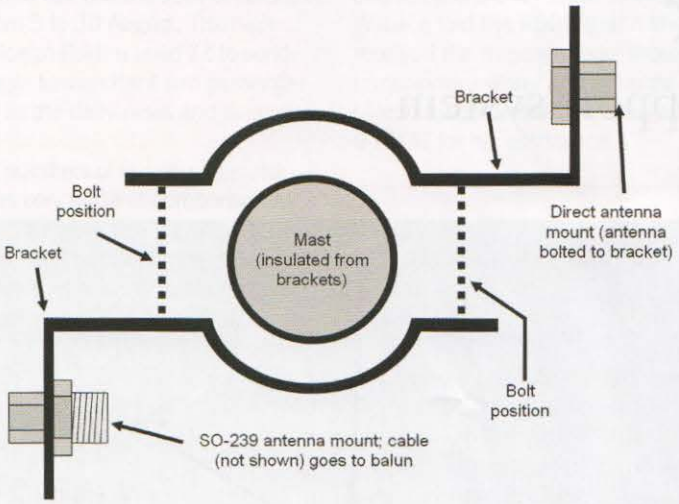

FIGURE 1: Two brackets bolted either side of the mast provinde mountings for the elements.

off a hole in its centre for the coax to pass through from the mast.

The balun support is made from a kitchen food cutting board, with holes added to reduce any windage effect. The home-made anti-windage support, Watson WHF-40 antenna sections and the upper antenna support bracket, which is constructed from a paint roller extension pole, can all be seen in Photo 3.

PHOTO 3: General view of the complete antenna system packed ready for transport.

MOUNTING FRAME. In order to provide a reasonably sturdy base for the Sky-Painter, I decided to modify a typical folding DIY work stand. At the bottom of the antenna base (work stand) I have tied on four small plastic wedges for levelling it up on any uneven surface. I chose this form of base as it gives a good lower antenna weight ratio and I have found in practice that tripod bases, although good for verticals, tend to be a bit unstable with dipoles unless their legs are long and well spaced apart. You could also use a galvanised car stand-on type support bracket with a short piece of scaffold pole attached for a more portable base.

BALUN. The choke balun converts the 50Ω unbalanced feed to balanced 50Ω for the anennas and is constructed from five turns of the RG58 feeder, passing through two 25mm OD ferrite rings that are glued together. The coiled coax has a centre coil diameter of 140mm. This is mounted on a kitchen cutting board by using nylon cord to tie the cable down, although cable ties could equally well be used. The back of the balun support board has plastic spring type pipe clips at the top and bottom for clipping it to the mast, as seen in **Photo 4**, to prevent it from blowing about in the wind. Vertical support is provided by loops of nylon cord that go between two plastic kitchen shelf support blocks on the cutting board to two small metal shelf brackets attached to the antenna mounting bracket. Grommets are fitted to the metal brackets to prevent damage to the cord. The dual ferrite rings have three medium cable ties around them to help protect them from any possible chipping while on the move.

POLE. I used a Harris Poz Lock fibreglass window cleaner's extension pole as the mast. These are available in two sizes, both of which extend to about double their collapsed height. In practice, I found that the larger pole was just too big to fit inside my small car, so I went for the shorter extension pole. The Poz Lock feature of the pole locks into spaced holes that extend up the length of the top extending section, stopping it from rotating about.

The pole is secured to the base using two clamps. One is shown in **Photo 5**. They were both constructed from 54mm car exhaust clamps but the back of the clamps were not used. Instead, two strips of rubber cut from a drain cleaning plunger were used. The first as glued to the antenna support base itself, the second fitted inside the rounded metal edge of the clamp, to cushion the fibreglass mast. This rubber strip was bound to the clamp with blue polypropylene cord and secured in place, on the outside of the clamp only, with Araldite. Wing nuts were required for the back of the clamps for raising, turning and lowering the mast section by hand.

ANTENNA ELEMENTS AND ANTI WINDAGE. The Watson WHF-40 antennas are intended to be used in a vertical position and, when horizontal, put a considerable strain on their mounts – which is made worse by any wind. To rectify this I made an upper mast support and an anti windage bracket that supports the elements from above and stabilises them horizontally.

The horizontal stabilisers were fitted to a diecast box that was cut out using a step drill so it could slide over the pole (**Photo 6**). The two shiny aluminium tubes, sourced from an FM dipole, were glued inside it with Araldite. Any remaining gaps were sealed with white silicone sealant. A bolt was then glued inside the tube ends. Nylon and PVC washers were glued on and the red ones, came from the same drain plunger as mentioned earlier. This can be seen in **Photo 7**. The removable end stops were made from a nut, glued inside a PVC tube and covered with a grey rubber, metal tube end cap.

The upper mast support construction details are shown in **Photo 8**. The paint roller on the Harris paint roller extension pole was too brittle to be useful so I replaced it with a 1½ inch internal diameter silver-looking plastic drain pipe. Holes were drilled and grommets fitted to take the nylon support cords. I covered the mast part with insulating tape for extra weather protection and fitted a Tommy bar, just above the internal screw fitting. As this assembly rotates to fit, I found it easier to fit a pair of plastic ship type cable cleats to the sides with self tappers.

The Watson dipole elements required extra hook type supports to be fitted so that the support cords could be attached. These are made from PVC cable cleats, bolted to rotatable hooks taken from £1 coin token shopping trolley keyrings. They can be seen

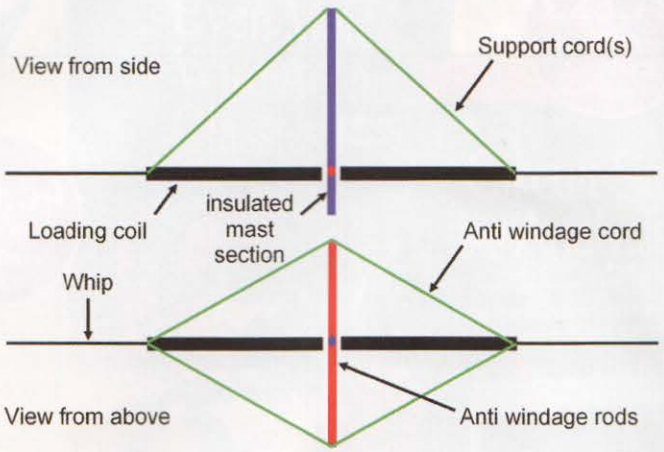

FIGURE 2: Basic principle of the antenna guy system. Upper image: resisting gravity. Lower image: anti-windage system.

in Photo 9 along with the insulators and eyes used as strain reliefs on the horizontal and vertical support strings. I used 3mm nylon string for all but the horizontal support, where I used 1.5mm nylon, available from your local chandler.

Attach large tie-wraps on the nylon cords, inside the uppermost plastic tube, to balance the antenna system and to stop any possibility of it moving sideways. The outermost nylon cord, is in the form of a large loop and has its ends tied up in here, to hide the knot. Remember to melt the cord ends with a match etc to stop them from fraying. The central nylon cord is one length, where the cord end is folded back around the end insulators. Remember to slip on the heat-shrink first. The cord ends are then cut back and securely glued together. Do not use Super Glue as it will not hold. Instead, grip the folded nylon cord end together temporarily with tie-wraps and then Araldite the folded over cords together. After setting, remove the tie-wraps and shrink the heat shrink over the end, adding a few white tie-wraps to stop the heat shrink ends from tearing.

Originally the nylon support passing through the centre of this tube was going to support the ends of the steel whips but, in practice, they bowed back on themselves. I found that the steel whips actually required no support at all. This now extra nylon support is connected to the middle section, as well as the other loop, coming from both ends of the upper support tube. In windy conditions, I can quickly attach this central nylon cord to support both sides of the antenna system. This gives me time to connect up the anti windage support nylon cord ends without any concerns over strain on the antenna connections. The horizontal anti windage loop is actually two half loops of thin nylon cord passing through each end egg insulator and cut back and secured with Araldite, in a similar manner to the central upper cord. These support ends were made using black PVC coated flexible wire bent around the insulators, covered with 10mm diameter heat shrink and crimped. The crimped end, which must be large enough to attach to the antenna hooks, can either be soldered at the hole in the crimp end or have a spot or two of super-glue applied, to stop any water ingress. The heat shrink tubing is then shrunk and a few small black tie-wraps are added, to prevent the heat shrink from tearing.

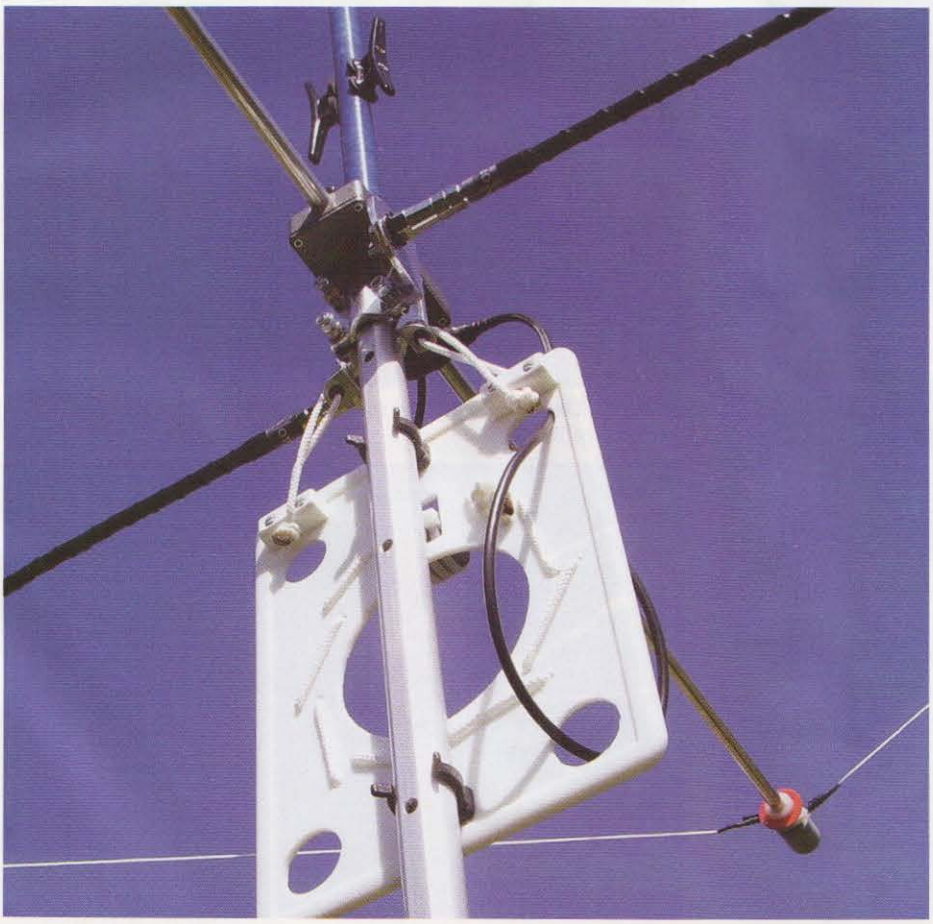

PHOTO 4: More details of the balun mounting.

TESTING AND TUNING. Before connecting up to your transceiver it is sensible to first check that the antenna elements are roughly in the centre of the band you wish to operate. This can be accomplished by using an antenna analyser or, as I did, a dip meter. Photo 1 shows the mast fully extended and ready for initial tuning up checks.

The total length of RG58 C/U 50Ω feeder used was about 70 feet (about 30m). I estimate the coax loss to be less than 1dB at 7MHz, as this coax has a loss of about 1.4dB per 100ft at 10MHz. I was not too fussy about this, as after all it was a field day antenna. The feeder was terminated at both ends with the wider rear fitting compression PL259 connectors. I covered over the rear part of these connectors with self-amalgamating tape for extra support and to prevent water ingress. The self-amalgamating tape was then covered with insulating tape to stop the connectors from permanently bonding to the remaining coiled coax. The initial tuning was done with the mast lowered. Remember to balance the lengths of the stainless steel whips! For my first test, the dip meter indicated resonance at about 7.1MHz, which was a great starting point. For final tuning the mast was raised to full height and the coax connected to my transceiver with an SWR meter in line but no ATU (actually, I had my ATU switched to

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'bypass', which amounts to the same thing).

Testing was done at reduced power to start with. I decided to tune up the antenna for a best VSWR setting at about 7.13MHz. The VSWR was 1.1:1 in dry conditions but dropped to 1.3:1 in the wet, due I think to increased capacitive coupling between the elements and ground. The 2:1 VSWR bandwidth in dry conditions was found to be about 84kHz. This is slightly better than the manufacturers quoted typical bandwidth of 80kHz. When tuning the antennas it is wise to heed the manufacturers warning about whip lengths: "If required, cut off the bottom of the whip to ensure that it does not extend into the dense part of the coil winding. Failure to observe this precaution will cause extreme heat damage and void any warranty".

The Watson WHF-40 antennas are rated at a maximum power of 200W PEP. The generally-similar Pro.Am PHF 40B 40m antennas can be used in place of the Watson WHF-40 antennas I used, but according to the manufacturers figures are likely to give a bandwidth of nearer 60kHz but with a power handling of 250W PEP. Do not mix antenna types, because mechanical balance is as important as electrical balance.

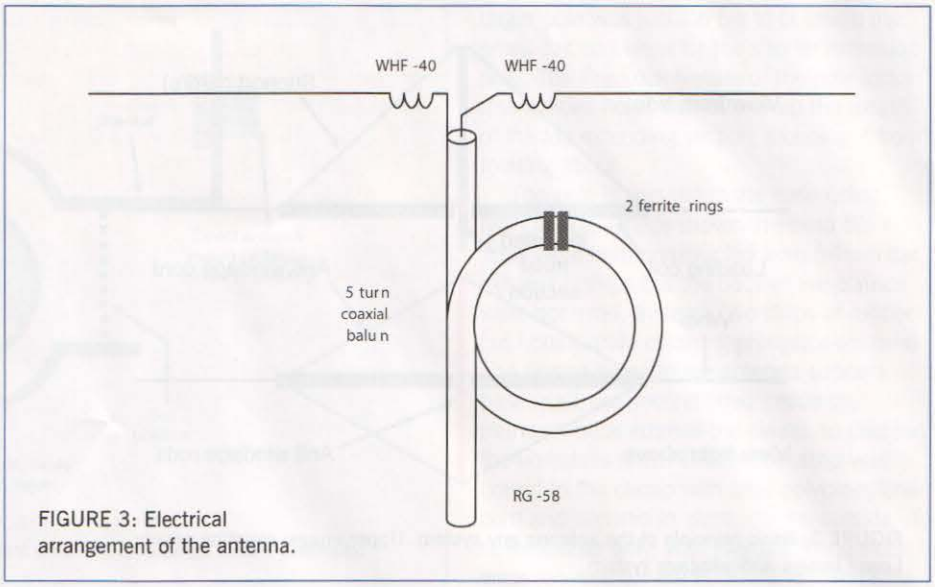

FIGURE 3: Electrical arrangement of the antenna.

This antenna system was not designed for gale conditions but you could place a sandbag over the inside of the antenna base in very windy conditions. I have no intention or desire to test it to the limit.

NOTE. I recommend that you use an ATU when the VSWR is greater than about 1.5:1.

PHOTO 5: Clamping the mast to the support.

PHOTO 6: Diecast box for the anti windage horizontal rods.

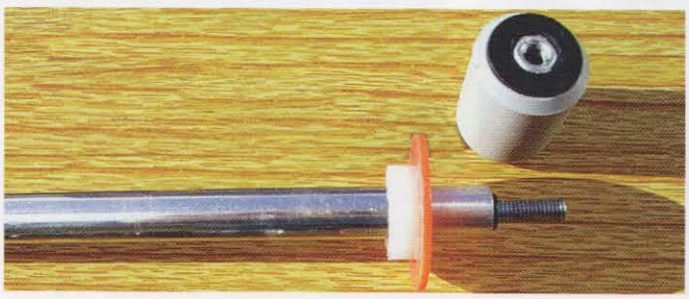

PHOTO 7: One of the anti windage rods.

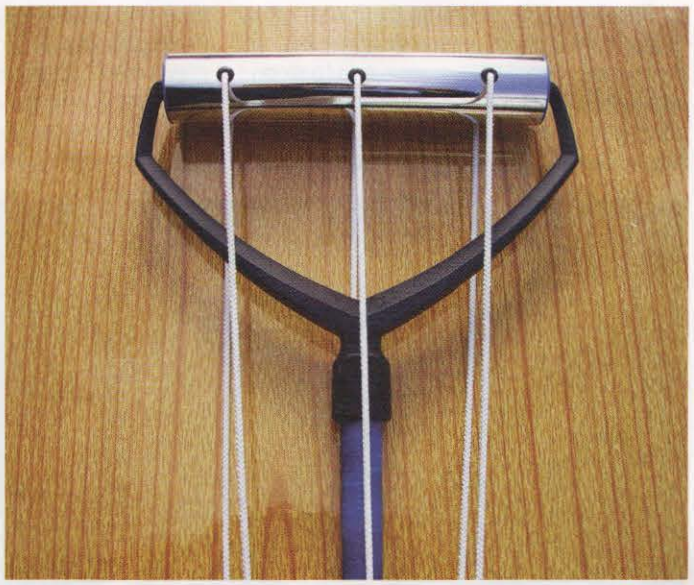

PHOTO 8: Closeup of the upper support.

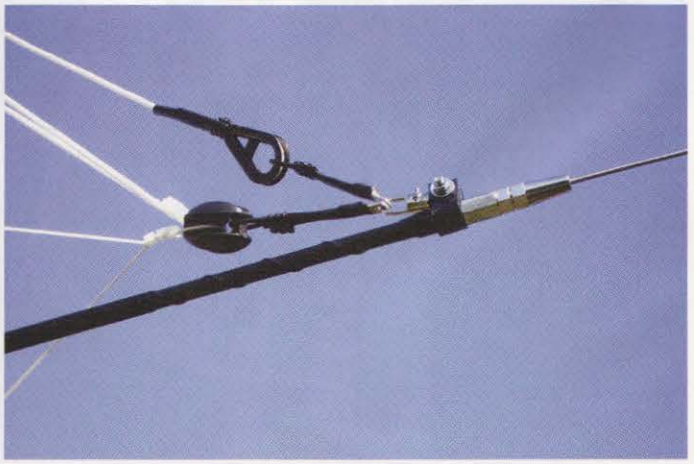

PHOTO 9: How the nylon cords attach to the antenna loading coils.

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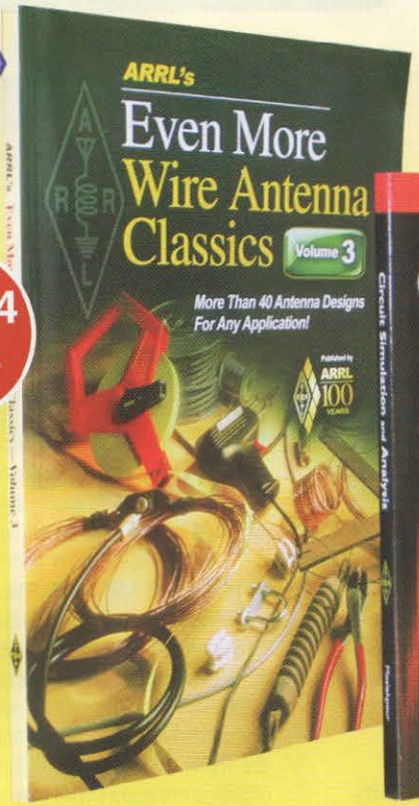

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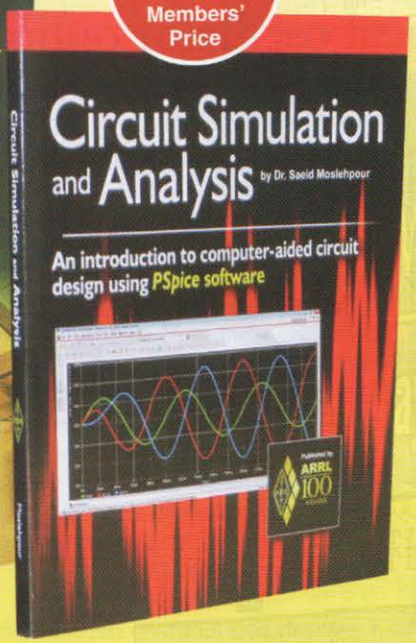

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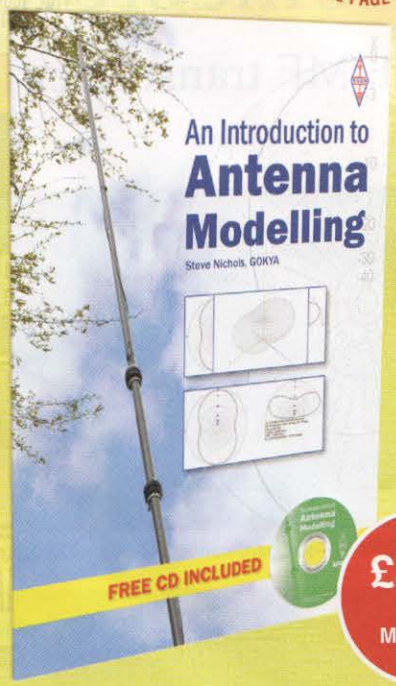

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ARRL Circuit Simulation and Analysis provides a great introduction to the PSpice and is the ideal companion for anyone who constructs their own circuits.

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By Steve Nichols G0KYA

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Homebrew

LF/MF transceiver local oscillator options

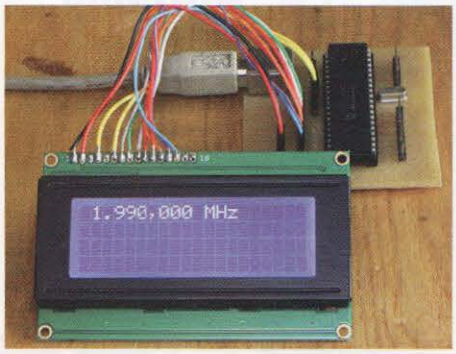

PHOTO 1: PIC board connected to a 4x20 LCD.

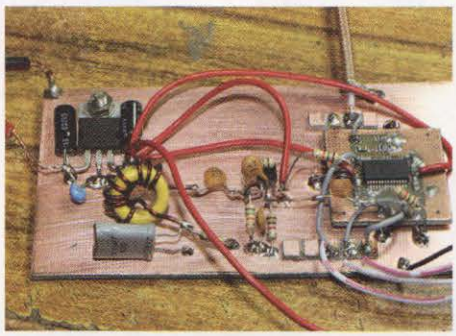

PHOTO 2: The oscillator and direct digital synthesiser under test.

THE VFO. The local oscillator is one of the key components in a superhet transceiver. At one time, a simple free-running variable frequency oscillator (VFO) was the most popular choice in both home made and commercial equipment. The humble VFO is still quite hard to beat in terms of spectral purity. For most purposes, good long term frequency stability is the most important characteristic of a VFO. A drift rate of around 100-200Hz per hour was considered quite adequate for amateur SSB or CW use. A well designed and carefully built VFO is just about capable of this level of performance. For best results, the oscillator should be allowed to 'warm up' for at least a few minutes before use and the oscillator frequency should be reasonably low. Ideally, the VFO will be kept away from sources of heat so that its components will be maintained at a constant temperature. Unfortunately, in many cases, the VFO shares its enclosure with a high power transmit PA. It is possible to improve frequency stability by applying some form of temperature compensation. This is usually achieved by taking advantage of the positive or negative temperature coefficient of certain types of capacitor. One simple and rather elegant approach is to use a capacitive bridge based on a variable differential capacitor with a positive temperature coefficient (PTC) fixed capacitor on one side and a negative temperature coefficient (NTC) fixed capacitor on the other. This provides a very easy way of applying any desired amount of positive or negative temperature compensation to an LC resonator.

Many different frequency schemes have been used in amateur equipment. One popular arrangement uses a 5-5.5MHz VFO. This allows full coverage of the 80m and 20m bands when a 9MHz IF is used (5 + 9 = 14; 9 - 5.5 = 3.5). For all band coverage, a more elaborate circuit will be required. The free-running VFO is relatively simple, has a low component count and is easy to assemble. The disadvantages of a VFO are

- relatively poor long term stability (drift)
- sensitivity to short term instability due to mechanical vibration
- difficult to design and adjust for best stability
- not easily to control using digital techniques
- lacks the frequency agility of alternative systems like phase locked loop (PLL) or direct digital synthesis (DDS).

FREQUENCY STABILISERS. Frequency stabilisers of the 'huff & puff' type offer a very attractive solution to the problem of frequency drift. Anyone with an interest in huff & puff stabilisers should visit the huff & puff reference library by Hans Summers, G0UPL [1]. A typical device will use some form of digital frequency counter to measure the VFO frequency and compensate for any measured frequency drift by applying a correction signal to the VFO. In the case of a standard LC VFO, frequency control is usually applied by feeding a correcting voltage to a small varicap diode in the VFO. In the simplest systems, the digital counter may be as simple as a single logic gate; effectively a one-bit counter. More elaborate systems employ a full digital frequency counter with many bits of resolution. The ready availability of microcontroller ICs with built-in counter/timer hardware makes it easy to build a stabiliser that is largely based on software. The simple PIC frequency counter project (Homebrew October 2006 and [2]) shows how a fully-featured frequency counter can be made using very simple hardware. It is relatively easy [3] to add the necessary components to make a combined counter / display / stabiliser. **Figure 1** shows the arrangement of the stabiliser section of the counter/display/stabiliser unit that is fitted to my old HF transceiver. Pin 17 of the PIC is normally held high and pin 18 held low. As the two 1N4148 diodes are reverse biased, no current is supplied to the capacitor in the LPF/integrator circuit. When a frequency correction is necessary, positive or negative pulses are provided as required. One of the biggest advantages of huff & puff style stabilisers is that they are relatively easy to fit to existing VFOs in home made or commercial equipment. The slow rate of frequency correction means that the spectral purity of the original VFO is retained. The correcting action will lead to some random phase noise, but this will be contained to a bandwidth of just a few Hz. This is of no significance for human-readable modes like SSB or CW, although some narrow bandwidth digital modes may be affected by the huff & puff action.

SYNTHESIS AND THE PLL. It is not easy to come up with a precise definition of a frequency synthesiser. The best I can manage is: 'a device that generates a signal at a frequency or range of frequencies that are not necessarily directly related to the frequency of the reference clock/timebase'. A PLL or direct digital synthesiser (DDS) may be described as a frequency synthesiser. A simple VFO or an oscillator combined with a frequency multiplier or divider would not fall within this definition.

Huff & puff stabilisers are basically a form of PLL. Both techniques use some form of phase/frequency detector, a loop filter and control feedback to stabilise an oscillator. The difference between a PLL and huff & puff system is largely a matter of speed and bandwidth. Most PLL synthesisers cover a relatively large frequency range and apply correction to the oscillator (VCO) at a relatively fast rate. This makes PLL systems prone to close-in phase noise and spurious signals appearing above and below the wanted carrier at multiples of the PLL reference frequency. This can be particularly troublesome where a low reference frequency like 5, 10 or 12.5kHz is used. These problems can be reduced to negligible levels by careful design of the VCO, PLL loop filter and a suitable choice of reference frequency. Some of the best frequency synthesisers use a combination of PLL and DDS techniques. See Homebrew June/July 2010 for details of a VHF DDS/PLL hybrid synthesiser that combines the best aspects of a PLL with the fine tuning resolution of a DDS.

DIRECT DIGITAL SYNTHESIS. As the name suggests, the signal generated by a DDS is generated directly and not by a controlled oscillator as found in a PLL. A typical DDS implementation generates a sine wave (or other waveform) by reading a table of stored digital values and applying them to a digital to analogue converter. A LPF is used to remove the clock and alias signals and to smooth out the 'steps' inherent in a digitally sampled signal. The result is a very good approximation of the required waveform.

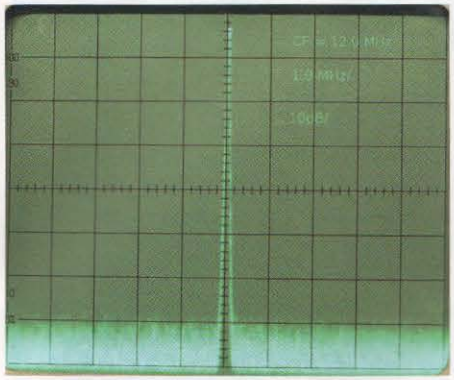

PHOTO 3: Output spectrum of the direct digital synthesiser.

Several of our previous signal generator and local oscillator projects have used DDS synthesisers. As DDS ICs are surface mount devices with very close pin spacing, it is not that easy to build a DDS using point-to-point wiring methods. That said, I have successfully built a couple of dead-bug style DDS units based on the AD9835 IC, so don't be afraid to have a go. As I have previously designed PCB layouts for the AD9851 and the AD9951, I will use a PCB mounted device for this month's project.

The DDS is controlled by a PIC18F4550 microcontroller. The PIC chip is programmed with the Pinguino [4] boot-loader so that it is easily re-programmed in circuit using a PC and a standard USB cable. It is necessary to use a PIC programmer for the initial installation of the boot-loader. Once this has been done, all future changes can by uploaded via USB. I used a very simple serial port programmer (Homebrew, July 2006) to load the boot-loader. Any standard PIC programmer that can handle 40 pin DIP devices should be able to do the initial programming. As you only need to do this once, perhaps you can get someone to programme a couple of chips for you instead of building, buying or borrowing a PIC programmer. The boot-loader HEX file is supplied with the Pinguino IDE software. The PIC is mounted on a simple PIC project board (see [5] and Homebrew, November 2009). This is basically a plain board with a 40 pin socket, 20MHz crystal, USB socket and lots of header pins for the I/O pins of the PIC. You can build or buy a fancier PIC board with on-board power, buttons, LEDs etc, but I enjoy the great flexibility that this basic board allows. Nothing is pre-determined; all I/O pins are free and available for any purpose. **Photo 1** shows the PIC board connected to a 4x20 LCD display module. The wiring of the LCD module is shown in **Figure 2**. Pin numbers are for the Maplin N27AZ 2x16 display. Most of the standard HD44780 compatible LCD modules use the same pinout, but you should check the data sheet for your display to make sure it is the same. As there are plenty of free I/O pins available, the display is driven in 8 bit mode rather than the alternative 4 bit mode, which would reduce the number of wires used for interfacing. There isn't much to be said about this example. Data and commands are sent to the LCD module using all 8 bits of PORTB on the PIC [6].

The Register Select (command or data) and Enable pins are wired to general purpose I/O pins on the PIC. As the display is always written to and never read from in this particular application, the R/W pin of the display (pin 5) is wired to ground.

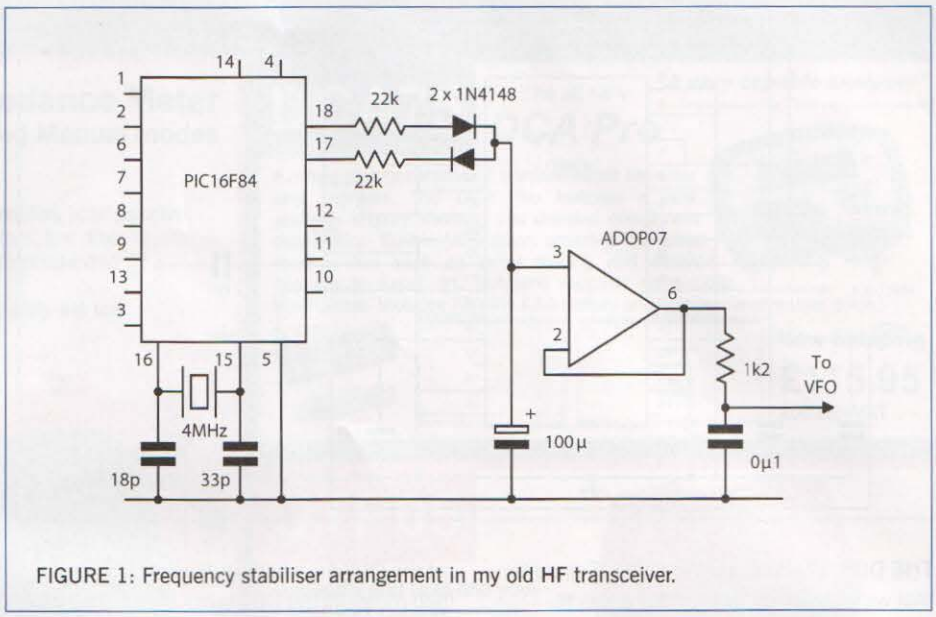

FIGURE 1: Frequency stabiliser arrangement in my old HF transceiver.

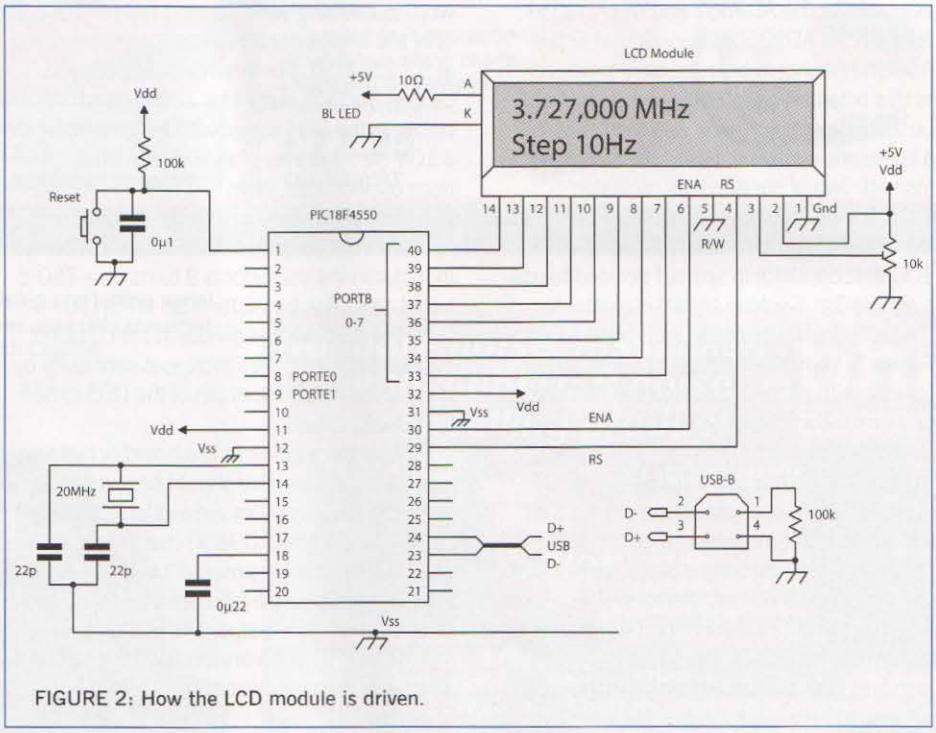

FIGURE 2: How the LCD module is driven.

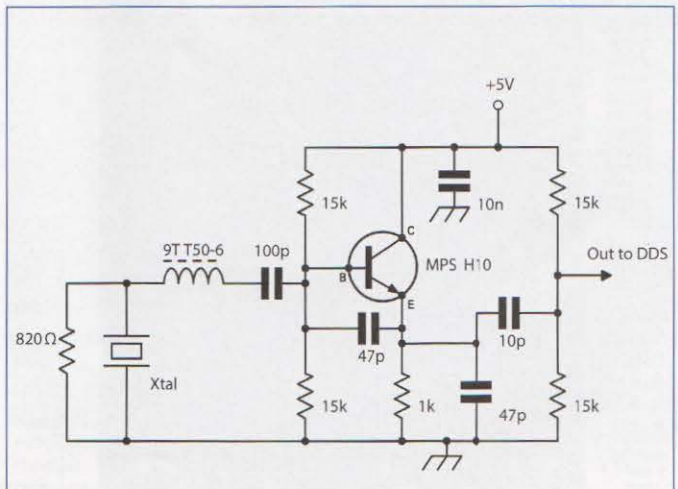

FIGURE 3: Third overtone oscillator for the DDS clock.

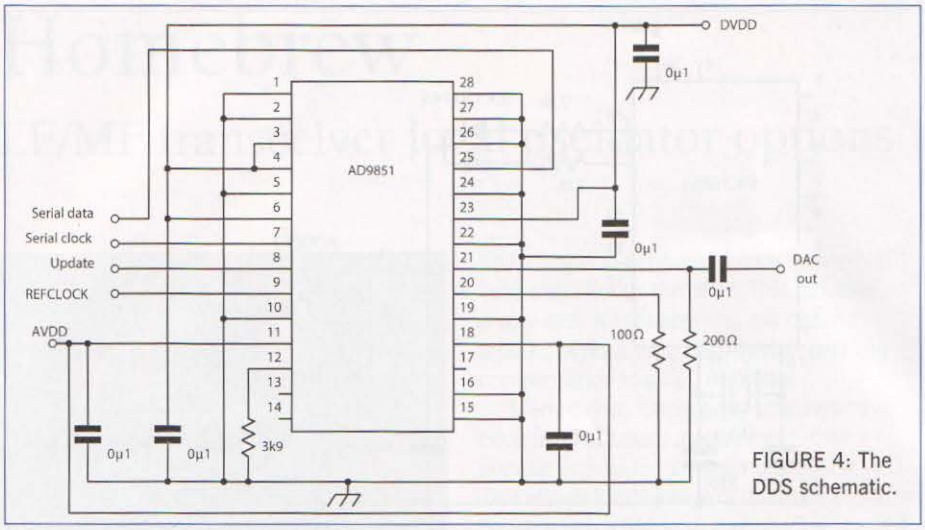

FIGURE 4: The DDS schematic.

THE DDS. We have a choice of DDS circuits that were designed for previous projects. PCB layouts and programming code are available for the AD9851 and the AD9951. As the older AD9850 is very similar to the AD9851, it should be quite easy to use one in this project. The AD9951 would probably be the better choice here. As I didn't have a spare one available, I used the AD9851 instead. Two of our previous oscillator/generator projects used a 100MHz OCXO as the DDS Refclock. As I didn't have another 100MHz oscillator to spare, I decided to use a simple 3rd overtone crystal oscillator for the DDS clock. The oscillator is shown in **Figure 3**. I have found this oscillator quite reliable with either 3rd overtone (OT) crystals or with fundamental crystal that are forced to oscillate in a 3rd OT mode. The crystal in my oscillator is marked 17.7344MHz. OT crystals tend to oscillate at frequencies that are not an exact multiple of their fundamental resonance. It is also very difficult to measure the frequency of an unbuffered VHF oscillator because the measurement probe will tend to disturb the frequency. The simplest solution is to build the oscillator, install it in the DDS, set the DDS for a known division ratio and then measure the DDS output frequency with an accurate counter, ie setting the frequency word to $2^{32}/10$ gives a division ratio of 10:1. This test shows my crystal oscillator is running at 52.253MHz. For extreme precision, you can set the DDS output for 10MHz and compare the DDS signal with a signal from a 10MHz frequency standard on a dual trace oscilloscope. Note that no frequency trimming is provided on the crystal oscillator. All calibration is done in the PIC code. The inductor in the oscillator is 9 turns on a T50-6 toroid core. The transistor is an MPSH10. Note the DC potential divider at the output of the oscillator unit. This increases sensitivity by biasing the Refclk input pin of the DDS to half the supply voltage.

Before you start etching a board or building a dead-bug circuit, you should be aware that complete DDS modules are available on eBay. Units based on the AD9850 currently cost around £5 including postage. Units based on the newer chips are a bit more expensive, but still extremely good value. The boards usually include the PIC and a tin-can Refclock oscillator, all for less than the price of the IC alone!

The DDS circuit is shown in **Figure 4**. The circuit consists mostly of ground and power supply connections. This makes for a rather ugly schematic, but a very easy circuit to build, particularly if you make it on a PCB. The PCB layout and connection details are shown in **Figure 5**. The DDS uses separate power supply lines for analogue and digital sections of the chip. You can provide separate supplies by using a pair of 5V regulators (for the 9851 or 50). I have done this in previous projects, but this time, I ran separate +5V supply wires back to a single 7805 regulator. For the final circuit, a ferrite sleeve was placed on each of the three +5V wires: A_vdd, D_vdd and +5V to the Refclock oscillator. **Photo 2** shows the DDS and oscillator under test. Note the use of small strips of PCB laminate with isolated pads cut with a hacksaw. These are super-glued to the main ground foil and used as connection terminals for the three digital control wires from the PIC board. I have learned from painful experience that it is a bad idea to solder long interface wires to tiny PCB pads or, even worse, directly to the IC pins.

Details of the interface between the PIC and DDS are shown in **Figure 6**. Wire length doesn't seem to be particularly critical. I used three 10cm lengths of small diameter hookup wire. I have used shorter and longer lengths without any reliability issues. For the initial tests of the DDS, I used a 200Ω, 33MHz LPF at the DAC output. This filter was originally designed for use in a HF bench signal generator. It will be replaced by a new filter for next month's final tests. The output of the DDS is shown in **Photo 3**. The output frequency is 11.987MHz. This results in an RF frequency of 1.990MHz with my 9.997MHz IF. The spectrum analyser plot shows a 10MHz span centred on 12MHz. All spurious signals are below the analyser noise floor and the performance of the DDS compares well with the figures specified in the Analog Devices data sheet. The 2nd harmonic at 24MHz is at -57dBc and the 3rd harmonic is in the noise at -70dBc. The new planned ~15MHz low pass filter should reduce harmonic and alias output even further.

Next month we'll look at the receiver AGC and final boxing up of the project.

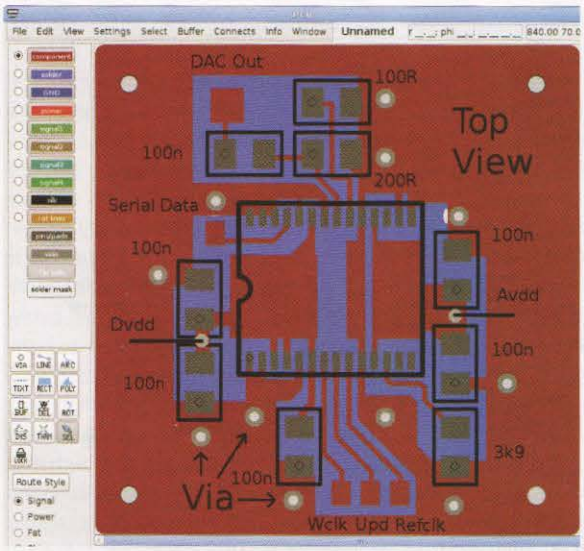

FIGURE 5: The DDS printed circuit board.

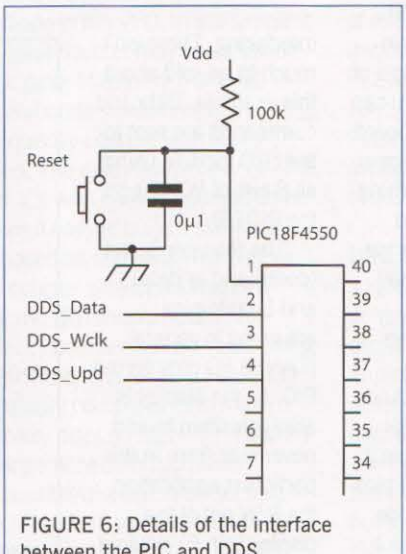

FIGURE 6: Details of the interface between the PIC and DDS.

WEBSEARCH

[1] www.hanssummers.com/huffpuff/library.html
[2] http://homepage.eircom.net/~ei9gq/counter.html
[3] http://homepage.eircom.net/~ei9gq/stab.html
[4] www.pinguino.cc/
[5] http://homepage.eircom.net/~ei9gq/picboard.html
[6] PIC18F4550 data sheet, Microchip

July 2014 • RadCom
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IOTA

An interview with Mike McGirr, K9AJ

CELEBRATE! By the time you read this, the 50th Anniversary Convention, Beaumont House, Windsor will be upon us and all IOTA enthusiasts will soon know the 10 brand new IOTAs. There has been plenty of speculation on various reflectors and websites on these new IOTAs. More on this and some pictures from the Convention next time round.

INTERVIEW THE ACTIVATOR. Mike McGirr, K9AJ grew up in New Jersey and was first licensed as WN2JYN in 1963 while still in high school. He quickly developed a love for DXing and remembers cutting college classes to work Gus Browning, W4BPD and Don Miller, W9WNV.

A doctor, Mike is at the top of the DXCC Honor Roll and only needs P5 on CW. He has operated from 27 DXCC entities and has been a team member on some notable DXpeditions: K9AJ/KH5K (Kingman Reef), AH1A (Howland Is), VK0IR (Heard Is), VP6DI (Ducie Is) and BS7H (Scarborough Reef). Mike has also operated from 41 IOTAs and has helped activate 13 all-time new counters. He has 1,061 IOTAs confirmed and is a member of the CQ DX Hall of Fame.

Mike gives much credit to his wife Susan, K9XYL for encouraging his passions of DX and IOTA chasing.

With over 1000 IOTAs confirmed, when did your passion for island chasing and activating begin?
DXCC new ones had become infrequent and I missed the excitement of the chase. I set a goal to work 5BWAZ and did that in a few years. I missed the 'one ringer' phone calls in the middle of the night (that's where a local would let the phone ring once and I'd check in on our 2m repeater to get the DX info). The IOTA programme offered me a world of 'new ones' and a new group of buddies to share my excitement.

Kingman Reef, Howland Island, Heard Island, Ducie Island, Scarborough Reef. That's quite a collection of activated islands. Which one sticks out the most in terms of operating and enjoyment?
All these operations are remembered and each presented different challenges. I was the night shift op on Scarborough and, because of the tides, the night op would go out to the 'rocks' around 5pm and could not be picked up until around 8am. The smaller rocks only had room for one man, so those ops were alone out on the reef for about 15 hours. The pile-ups were enormous and the brief 20m polar path to NA was covered by stronger signals from EU. One night I arranged two pile-ups: working EU up 5-10 and NA up 15-20, alternating between the two. After the operation, I read where I was criticised for too wide a split, but few knew that I had split NA away from EU in two separate segments. Ducie was an all-time new DXCC with similar enormous pile-ups. JA1BK let us extend the boat charter for a few days so we could operate from Henderson (OC-056).

...and which one was less enjoyable, perhaps even dangerous?
Worst place I've ever been to was Miskitos Cays, NA-228 as H79W/YN4, off the east coast of Nicaragua. The place was a mangrove swamp with a central area of dry land. It is mosquito- and rat infested; I actually had a large rat run across my op table one night while I was QRV. Heavy thunderstorms didn't help things either.

I've never really felt I was in danger. I've served as team physician on most of the multi-multi DXpeditions I've joined. Part of medical planning involves contingency plans for medical evacuation. On most all of the exotic places I've visited, there was always an option to place a satellite call for a sea or air evacuation for a medical emergency. On Heard Island, however, once the *Marion Dufresne* (research ship) dropped us off, it sailed to Amsterdam Island. While the ship had an on-board operating room, it was still, at times, 7-10 days sailing away from us. That meant that a serious medical emergency might have delayed surgical attention. We never had such an issue on Heard, but the possibility was always in the back of my mind.

Solo, small group or large team? Which do you prefer when activating rare IOTA / DXCC islands?
Today, a small group can 'work' the pile-ups for a new IOTA in 3-4 days. It's important to pay special attention to the brief polar paths and that might take a few extra days. I'd like to think that in years to come, increased interest in IOTA will require more days to work all the deserving! For a rare DXCC entity, the 'audience' is much larger and a large team with more time is usually necessary.

Where do you see the IOTA programme within the next 10-20 years?
I would like to see the IOTA programme grow and for the same reasons that prompted my interest, I believe that when more DXers max out their DXCC totals, they will look to IOTA to continue their radio excitement. I see the IOTA programme eventually being integrated into LoTW, or a similar surrogate.

Mike, K9AJ during the H44AJ expedition to Sikaiana Atoll (OC-285) in June 2013, the first activation of this IOTA group.

Is there one abiding island group that may never be activated due to various factors, but given the chance you'd like to?
Rose Atoll (OC-190) is one I came close to activating. The US Fish & Wildlife agency is trying to eradicate an invasive species of ant on the atoll and a while back, the local F&W ranger was taking a team of entomologists out to Rose Atoll for four or five day visits every few months. I got him to promise he'd take me along if one of them cancelled at the last minute and thought I had a good chance joining one of those trips. Unfortunately, F&W cut the budget for work on Rose Atoll and those trips weren't funded the following year.

What simple advice would you give to a (new) operator with regards getting started in IOTA, either by chasing or activating?
If you chase DX (or even WPX), you likely already have a good start in IOTA. Sharpen your skills with contesting and attend one or more sessions of DX University. Prospective activators should do some operating from 'easy' places (eg the Caribbean), then join a team going to a semi-rare place and fine tune their operating skills.

IOTA NEWS. The 2014 Honour Roll and Annual Listings have been announced. A quick view tells us that I2YDX is top of Honour Roll with a truly impressive total of 1105. The IOTA Manager, Roger, G3KMA, is in 4th place, just 5 points off the top. A breakdown of results for the IOTA Marathon can also be found and top chaser was Steve, OM3JW with Vincent, F4BKV top activator. The top activators team was HP0INT. Hearty congratulations to all who took part in this fantastic event.

RSGB IOTA CONTEST. The contest takes place on 26 and 27 July, and it's pleasing to see the following UK IOTAs will be active during the contest: EU-008, EU-009, EU-010, EU-011, EU-012, EU-013, EU-099, EU-123 and EU-124.

There's a list of world participants at both ADXO (www.ng3k.com/misc/iota2014.html) and RSGB IOTA website (www.rsgbiota.org/activations/coming.php)

Notable activity from KL7RRC (NA-039) and VU3ARF (AS-153) also expected during the contest. Check the links regularly nearer contest time.

July 2014 • RadCom

Steve Nichols, G0KYA • e-mail: infotechcomms@googlemail.com

The M0CVO HW-42HP

A multi-band off centre fed dipole

MULTI-BAND. Nigel, M0CVO has built up a reputation over the past few years for making and selling cost-effective HF antennas. I featured his HW-20HP off-centre fed dipole in an earlier issue of *RadCom* and was quite impressed. In fact, the antenna was left up here at my QTH for an extended test and worked well on all bands from 20m to 10m, although you do need an ATU for 17m.

I think my log says it all really with contacts into ZL, VK, and VE7 on CW during the recent Commonwealth Contest, plus DX confirmations over the past year from Amsterdam Island (FT5ZM), China (BG2AUE), Burundi (9U4U) and Burkina Faso (XT2TT) among others. I have been very happy with its performance. And the antenna isn't really even in an ideal position – it is mounted as an inverted V about 8.5m high at the top of a 10m fibreglass fishing pole, hidden in a tree to keep it as stealthy as possible.

So when I was offered the chance to test M0CVO's HW-42HP off centre fed dipole I was eager to try it.

The starting point of the antenna is the classic off centre fed dipole.

MORE BANDS. This new antenna is designed to operate on all bands from 40m (7MHz) to 6m (50MHz). M0CVO claims it will operate on 40, 30, 20, 17, 15, 12 and 10m without an ATU (SWR <3:1) plus 6m with an ATU. Nigel says it is also possible to operate on both 80m (3.5MHz) and 60m (5MHz) via a good ATU, although the performance will be down.

The antenna is designed to handle 400W key down (CW) or 500W PEP (SSB).

The starting point of the antenna is the classic off centre fed dipole. The overall length of the antenna is 20.28m or 66ft, with a feed point 1/3 of the way along. This gives two legs of 13.52m and 6.76m and a feed point impedance of around 200-300Ω.

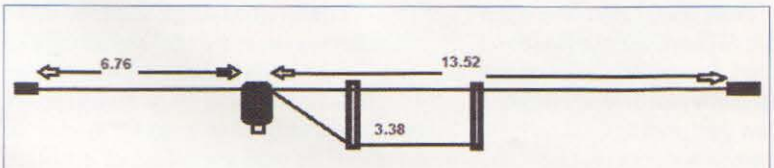
A 4:1 balun of M0CVO's design is added at the feed point to bring the impedance to something closer to the 50Ω required to match to coaxial cable, such as RG8 or RG213.

This classic OCFD design would ordinarily allow low SWR operation on 40m, 20m and 10m, but then Nigel has added a twist.

On the long side of the antenna he has added a separate element that is 3.38m long and connects to the feed point. This element is supported about 60cm under the main wire by two pieces of white 22mm PVC conduit of the type found in DIY and hardware stores. It is because of this length that the antenna has to be shipped by Parcel Force as it exceeds the length the Post Office will accept.

The antenna may be mounted horizontally, as a sloper or as an inverted V. And, if space is at a premium, M0CVO says it may also be 'bent' to fit in, with no loss in performance.

The balun is fitted inside a flame retardant ABS plastic box with a tongue and groove fitting to prevent ingress of both dust and water. It has the obligatory S0239 socket on the bottom with stainless steel screw lugs fitted to the sides whereby the grey insulated wire elements (supplied) connect to the balun inside. The wires are doubled back on themselves, secured by cable ties and then attached to the box via keyring-type retaining rings that take the weight off the connections. This is simple and effective. In the HW-20 version I have been using for the past couple of years I have had to repair one of the connections at the feed point, but this was due to the antenna whipping around in the gales that seem to hit the UK with ever-increasing regularity. The repair was a simple solder job and took less than 15 minutes.



On the long side M0CVO has added a separate element that is 3.38m long.

The far ends of the HW-42HP antenna elements are connected to two plastic dog bone insulators. Heat shrink tubing is used on all joints and the quality of workmanship is good, considering the low price of the antenna.

I tested the balun by placing a 200Ω resistor across the terminals and measuring the SWR with an MFJ-269 analyser. I measured 1.4:1/1.5:1 across the whole 3-30MHz range, which suggests that the impedance transformation is not quite 4:1. This is not uncommon and I have seen other so-called 4:1 baluns that behave in a similar fashion.

I mounted the antenna on the pole used for the HW20, with its apex at about 8.5m with the ends coming down as an inverted V – the longest element ending at about 2m high. Nigel suggests that the end of the second shorter lower element (where it is attached to the white tubing support) can be tied with nylon fishing line to the end of the antenna to keep it taut. I would agree with that idea, otherwise it can tend to fold back on itself.

SWR READINGS. Once erected (and fed with about 30m of RG213 with a 10-turn choke balun at the base of the pole) it was time to take some SWR readings. The table shows the results, but as you can see it was below 3:1 at all frequencies of interest

A 4:1 balun of MOCVO's design is added at the feed point.

and therefore within the range of internal ATUs. The actual SWR at the feed point is no doubt higher, but a length of coax (and its inherent losses) will result in an apparent lower SWR figure at the rig end. Your figures will no doubt be different with your installation.

The overall design has been designed to work on as many bands as possible and this it does remarkably well.

PERFORMANCE. So how does it perform? On back to back tests with dedicated dipoles it was usually equal to or no worse than one S-point down on just about every band. On HF it performed almost identically to the HW-20 OCFD it replaced.

In this installation it was quite a quiet antenna (especially on 21MHz and higher), no doubt helped by getting it as far away from the house as possible and feeding it with a choke balun. It certainly isn't a compromise antenna – I've seen plenty of antennas that offer a 1:1 match, but are deaf on receive and poor radiators. This one is 'lively' and each band was very accessible. A long list of countries worked isn't going to tell you much, but it offers multi-band dipole-like performance in a single antenna and could be a boon for amateurs without too much space.

But what of that design, some credit for which should go to Martin, G6VMR, who assisted in its design. A closer examination shows that the 13.52/6.76m legs gives an OFCD for 40, 20m and 10m. The addition of another leg 3.38m long appears to give a second OCFD with a total length of 10.14m and fed at the one third/two thirds point. In other words, an OCFD for 20m.

SWR Results

6.298MHz – 1:1
7.000MHz – 2.4:1
7.200MHz – 2.5:1
10.100MHz – 2.2:1
10.150MHz – 2.3:1
14.000MHz – 1.8:1
14.350MHz – 1.2:1
18.068MHz – 2.3:1
18.158MHz – 2.1:1
21.000MHz – 2.0:1
21.450MHz – 1.6:1
24.890MHz – 1.7:1
24.990MHz – 1.9:1
28.000MHz – 2.2:1
29.000MHz – 1.6:1
29.700MHz – 1.4:1
50.000MHz – 2.2:1
51.000MHz – 1.7:1
52.000MHz – 2.6:1
70.000MHz – 3.6:1
70.500MHz – 3.5:1

But life is not that simple – what you actually appear to get is a more complex arrangement that Nigel has obviously optimised to give the best (low) SWR results across as many bands as possible.

What the design did show (and this was backed up by my antenna model in MMANA-GAL) is that although the website suggests that the antenna could be used on 3.5MHz (80m) and 5MHz (60m), the SWR is very high on those bands, probably outside of the range of most internal ATUs. The performance is likely to be disappointing anyway as it is too short.

Overall then, the HW-42HP offers effective multi-band performance in a single package at a reasonable price. The antenna costs £56.95 from www.m0cvoantennas.com and our thanks to Nigel (07921 639 978) for supplying the review model.

New Products

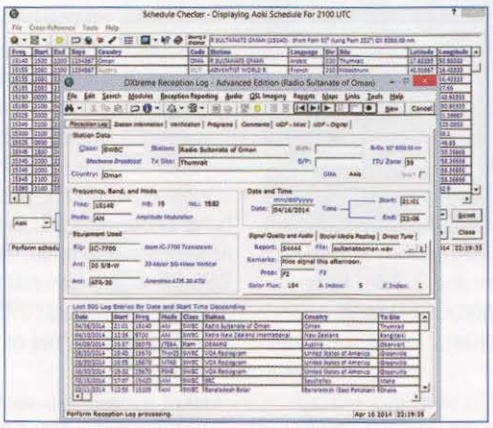
In amateur radio this month

FLEX 6300

ML&S tell us they are the first UK distributor to have stock of the new Flex-6300. Priced at under £2000, this important new model is a very welcome addition to the Flex family of SDR transceivers. It has dual panadapters and waterfall displays, as well as two full-performance slice receivers. It has wideband frequency coverage from 30kHz to 54MHz and transmit frequency coverage from the 6 to 160m amateur bands with 100W nominal output. A review of this new model will feature in *RadCom* in the near future. www.hamradio.co.uk/flex6300

NEW LOGGING SOFTWARE

The latest version of *DXtreme Reception Log* logging software for radio and TV monitoring enthusiasts is now available. It lets listeners and DXers log the stations they've heard and provides new features and advanced functions that can add a new dimension to logging activities. Version 9.0 includes social media posting, direct print SWL and address labels and Direct Tune, where users can change their rig's frequency and mode from the reception log window (if their rig is supported). It retails for US$89.95 worldwide for electronic distribution, www.dxtreme.com.



NEW ELECRAFT MODULES

Elecraft is introducing both 2m and 4m transverters for the KX3 transceiver. Both will be available by September and Waters and Stanton are taking orders now at www.wsplc.com. Only one transverter board can be fitted at a time but both will deliver 3W output and are mounted immediately above the area occupied by the optional auto ATU. If no ATU is fitted then a version with a daughter mounting board is required.

NOISE CANCELLING TECHNOLOGY

The new bhi Dual In-Line DSP noise eliminating module provides stereo noise cancellation and is suitable for use on all radios and receivers including SDR, but especially those with stereo or two channel output options. It can also be used with a standard mono speaker input signal. The module caters for both high and medium level audio input signals and has stereo line out, stereo headphone and mono speaker output sockets, making it very flexible. You can listen with headphones and a mono speaker at the same time, and you can also connect a pair of stereo computer speakers to the line output socket. The Dual In-Line incorporates bhi's new dual DSP noise cancelling module, which has an improved noise cancellation algorithm that brings even better quality audio to the listener when operating in very noisy conditions, making the processed speech clearer and more intelligible.

The new bhi Dual In-Line was launched at the recent Dayton Hamvention in the USA, and will be demonstrated at HAM RADIO 2014 in Friedrichshafen Germany towards the end of June and the National Hamfest at the end of September. A review will appear in a future issue of *RadCom*. For more information contact bhi Ltd, 22 Woolven Close, Burgess Hill, West Sussex, RH15 9RR, 01444 870 333, www.bhi-ltd.com

DUAL BAND MOBILE FOR UNDER £100

ML&S have recently introduced a tiny (120 x 88 x 38) dual band 2m/70cm FM mobile transceiver, the MyDEL RT-898. Weighing in at less than 300g, this new model has built in CTCSS encode/decode, 200 memories and 10W output. Audio is sharp and comes complete with the usual accessories. It is priced at £99.95 and will be available at the end June. See www.hamradio.co.uk

Getting started in mobile operation Part 2

Aerials and other practical considerations

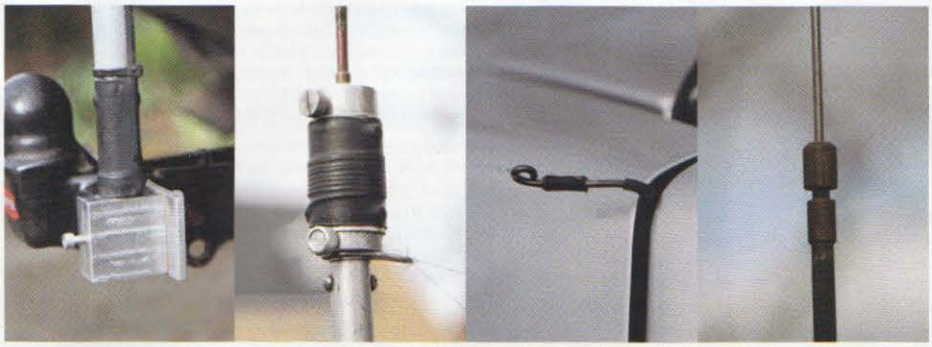


PHOTO 5: A selection of loading coils for use on bands from 160m up to 15m.

HF ANTENNAS. Having said it's possible to get good efficiency from a VHF mobile antenna, the same is not always true on the HF bands and it's here that good engineering will pay dividends. As we go lower in frequency the antennas that can reasonably be installed on our cars are much shorter than ideal and they become less efficient.

In order to obtain a resonant antenna on the lower bands it will be necessary to increase its electrical length by inserting a loading coil (an inductance) somewhere along its length. The author places his loading coils approximately at the centre point with an adjustable-length whip section above. This arrangement results in higher current in the antenna and hence greater radiation. **Figure 2** compares the radiation from base and centre-loaded 40m antennas – the centre-loaded antenna having some 5dB more gain.

Details of the salient points of my HF antenna are shown in **Photo 5**.

From the left:

1) Base mount on tow hitch with insulated section under heatshrink sleeve. Coax fed.
2) Coil mounted on 1.5m aluminium tube. Note the guying plate and fishing line guys.
3) Antenna guyed for stability. Guy attachment.
4) Length adjustment using brass collet.

The value of inductance you will need depends on the band, the length of the whip section and the overall length of the antenna. As a guide, the values used by the author can be found in **Table 1**. When winding the coils, an online calculator [3] may prove useful for establishing the number of turns.

Photo 6 shows a selection of coils and adaptors – ranging from the longest across the top for 160m through to smaller ones for 15m and adaptors for use on the higher bands where a coil isn't needed. The construction of a coil can also be seen. Each coil comprises aluminium end caps where the wire is terminated on solder tags and an insulating former made from hot water pipe. A screw thread has been cut into the surface to hold the turns apart but with care this can be achieved without.

Shortening the antenna to a manageable length has the effect of lowering the feed impedance well below 50Ω and so some form of matching network will be required. Unfortunately shortening the length reduces the bandwidth of the antenna to the point where on Top Band it's barely wide enough to cover a speech channel – as shown in **Figure 3**. Unless fixed frequency operation is acceptable some form of adjustable tuning and matching arrangement is needed. In contrast, the equivalent bandwidth on 17m can be seen in **Figure 4** and is 1.3MHz – far greater than the 100kHz of the 17m band.

If you want a complete one-stop solution for your mobile antenna then the major manufacturers can oblige. Both Yaesu [4] and Icom [5] offer a combined antenna / tuner for their mobile radios.

My alternative homebrew solution to these two requirements is shown in **Figure 5**. It comprises an inductor with separate banks of relays for matching and tuning. One bank selects a tap on a matching inductor that is connected across the coax at the base of the antenna. The second bank selects a tap on a second inductor for tuning that is inserted in the base of the antenna. An image of the unit can be seen in **Photo 7**. The switches are mounted on a separate control unit (the black box on the right) which is mounted near the driver – the matching unit being at

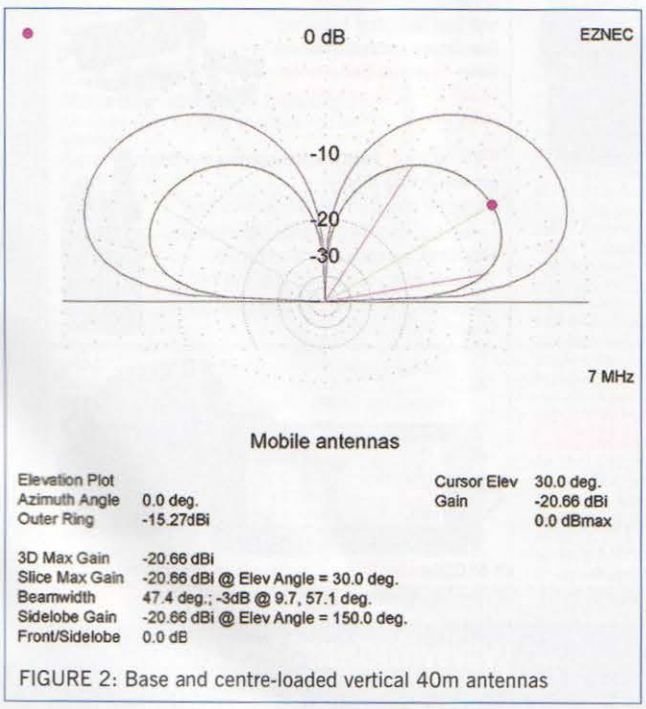


FIGURE 2: Base and centre-loaded vertical 40m antennas

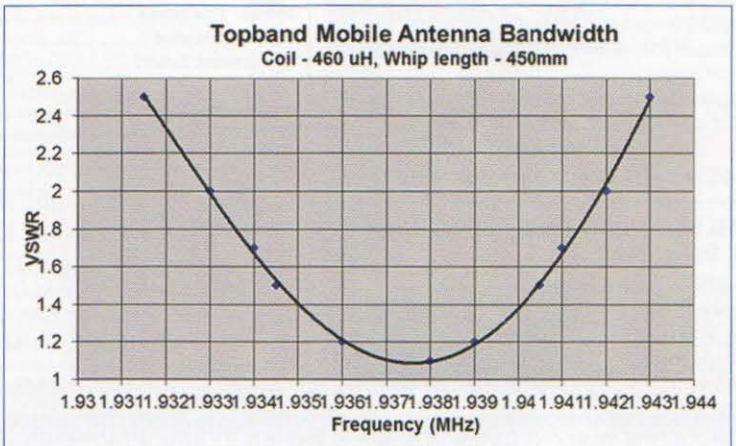


FIGURE 3: Typical bandwidth of a mobile antenna on 160m.

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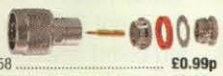

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PHOTO 6: Key components of the G4ERP HF antenna system

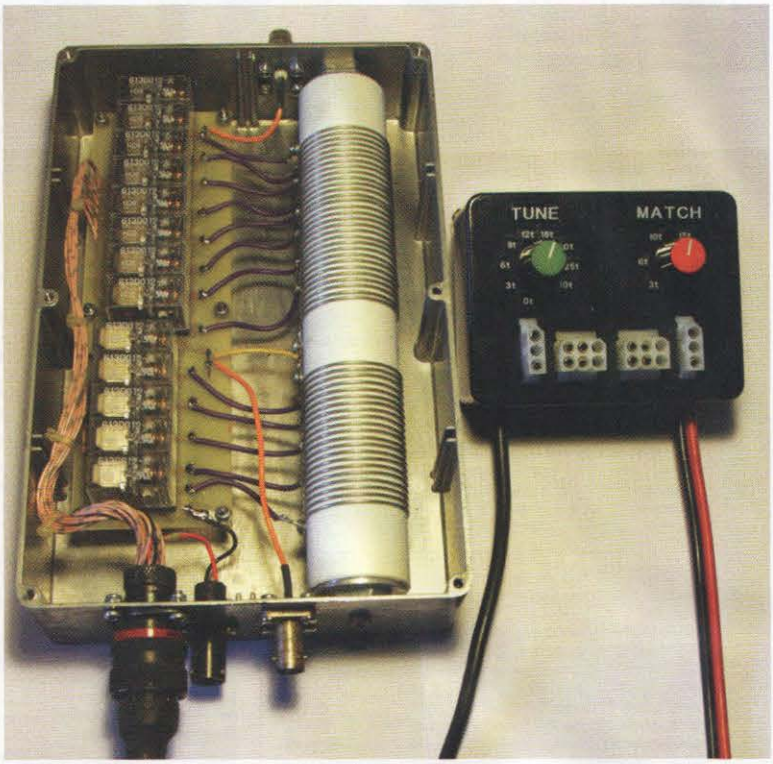

PHOTO 7: HF matching and tuning unit.

the rear of the car and as close as possible to the base of the antenna.

One thing that will be apparent to the reader by now is that a knowledge of the characteristics of your HF mobile antenna installation is necessary – if considerable frustration and missed contacts are to be avoided. I carry tables and graphs giving the settings for each band. They help minimise the time taken for a band swap. The optimum settings were established using an antenna analyser.

Given the narrow bandwidths on the lower bands, this task would be almost impossible without a device such as the MFJ-269 HF/VHF SWR Analyser [6].

MOBILE OPERATION AND THE LAW.

The law that forbids the use of hand-held mobile phones while driving (described in the "Amendment of the Road Vehicles (Construction and Use) Regulations 1986") specifically exempts the use of two-way radios. So, it is perfectly legal to use your radio while driving. There is, however, umbrella legislation that, quite rightly, says that you can be prosecuted for dangerous or careless driving.

This article has tried to emphasise the importance of using a hands-free system. Beyond this, common sense says that when traffic density or other road conditions require your attention they must always have priority.

EMC. Today's regulations place quite stringent limits on radiated emissions from on-board devices and car manufacturers will often also quote the susceptibility limits that their vehicles will meet. This means that you're much less likely to have problems with EMC when operating a radio in your car. This cannot be said for older vehicles. Driving along past a row of parked cars one day I set off four or maybe five car alarms in the space of 100m transmitting 80W on 2m.

First, check the manufacturer's quoted limits for susceptibility. Then check correct operation of all car functions at the maximum power you intend to use on each band *before* taking to the road.

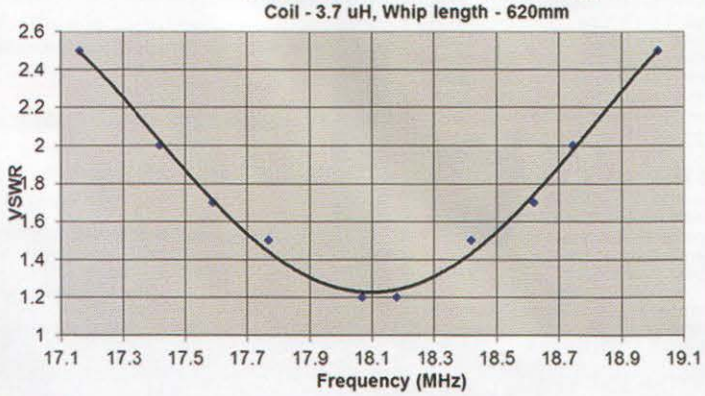

FIGURE 4: Typical bandwidth of a mobile antenna on 17m.

MOBILE? WELL, YES. Our licence doesn't specifically refer to motor vehicles in the context of mobile operation, so if you're walking, cycling or riding a horse you can also sign /M. I have tried all these modes of transport over the years.

Admittedly, the Trio 2200G I used from my horse in the mid-1970s was a little cumbersome but the modern miniature handhelds such as the Baofeng UV-3R make it very easy to conduct a QSO. This particular mode of transport has certainly caused both surprise and amusement on the air with the clip-clop of hooves audible in the background, see Photo 8. SOTA rules permit any form of ascent except bar motorised vehicles. For the first ever horseback activation of a summit I used my FT-817 mounted in a special pocket in a saddlecloth.

If you're a keen cyclist why not follow Simon, G4SGI's lead, **Photo 9**. He is often to be heard operating from his mountain bike. His current installation is based on a Boblbee backpack [7] for operation on VHF and UHF, however he has also operated on HF with a bike-mounted antenna. In this case he used an IC-703 mounted in the Icom backpack [8] with the radio's front panel attached to a harness like the ones used by photographers [9].

WALKING. Walking while holding a handheld isn't very easy. It completely breaks the rhythm. Add to that the low gain

PHOTO 8: G4ERP/M (and horse) heading for the summit of Cleeve Hill (G/CE-001) and a SOTA activation.

PHOTO 9: G4SGI's mobile 'shack' in action

of the handheld's supplied flexible antenna you'll realise that it's not a particularly efficient station.

Most day walkers use a rucksack and this makes a good mount for an antenna such as the half wave 2m antenna described in chapter 18 of the *RSGB Handbook*. This improved antenna, plus the addition of a small headset, makes an efficient, easy to use mobile station.

CONCLUSIONS. Operating mobile has been great fun but I've also learnt about propagation and honed my pile-up busting skills. Whether it's keeping in touch with friends via the VHF and UHF repeater network, chasing DXpeditions and countries on HF or indulging in some of the more unusual forms of mobile operation I've used my travelling time to good advantage. Looking back over the years, the D68C expedition of 2001 was particularly good fun with 16 band/mode slots achieved while a more sustained effort on 18MHz has netted 141 countries so far. Being away from your base station isn't a restriction to successful operating.

It's a great aspect of the hobby and one I hope you will try.

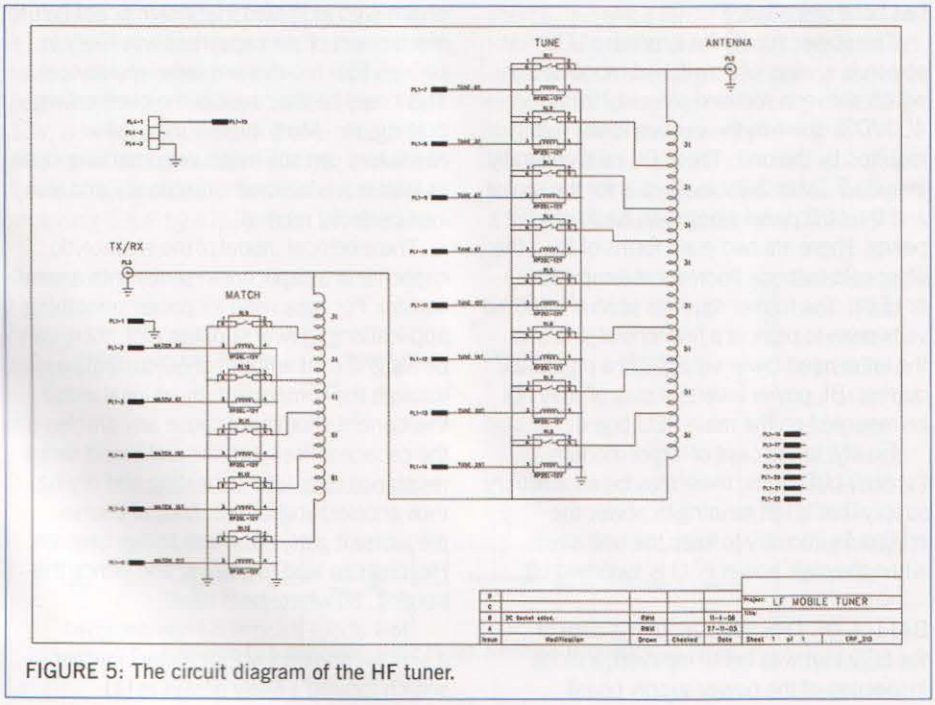

FIGURE 5: The circuit diagram of the HF tuner.

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[3] http://hamwaves.com/antennas/inductance.html
[4] www.yaesu.co.uk/product_info.php?products_id=1048
[5] www.icomuk.co.uk/categoryRender.asp?categoryID=3766&productID=1266&tID=673
[6] www.mfjenterprises.com/Product.php?productid=MFJ-269
[7] www.boblbee.co.uk/
[8] www.icomuk.co.uk/categoryRender.asp?categoryID=3766&productID=944&tID=647
[9] www.thinktankphoto.com/categories/camera-harnesses.aspx

TABLE 1: Approximate loading coil inductances (see text).

Band	Inductance (μH)
160m	460
80m	170
40m	35
20m	15
17m	3.5

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Electrolytic capacitor failure

A rather dry story

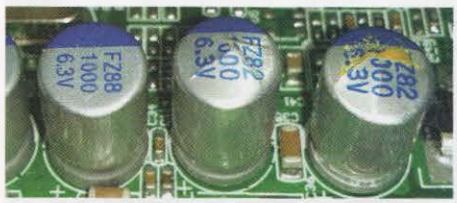

PHOTO 1: The electrolytic capacitor on the right has died and the one in the middle is extremely poorly.

IN THE BEGINNING. Some months ago, I was presented with a 22" wide-screen LCD monitor that appeared to be mechanically sound (no signs of crack to the display), yet would not power up. Having applied mains power, the unit would blink its power LED for a fraction of a second, which would then go out. What would be required to repair this quite useful item?

This article covers some of the lessons learned while repairing it. The project led to quite an education about electrolytic capacitors, the construction of a piece of previously unheard of test equipment, and an answer to the puzzle of the client who refused to use electrolytics in his products. This project has also led on to the repair of several pieces of radio equipment, along with an LCD video projector and a Tektronix oscilloscope.

WARNING. The largest capacitor on any switch mode PSU (SMPSU) board is generally the mains (primary) side reservoir capacitor and, in the case of a non-functioning power supply, **this may stay charged to a high voltage for several minutes after the unit has been unplugged from the wall.** Do not proceed any further until the voltage on this part has dropped below 20V.

BATTLE OF THE MOULDING. As it turned out, the most difficult part of the repair process for the LCD monitor was the removal of the rear panel since there were no apparent screws, fasteners or sky-hooks holding the unit together. Clearly there were things to be learned in the plastic-moulding department – lessons preferably to be learned on some other piece of kit.

I duly visited the kind folks at the local IT recycling centre and set about wrecking a couple of similar LCDs that had suffered more catastrophic failures (such as being thrown around a room in one of our earthquakes).

A common fastening technique used to hold front and rear plastic pieces together appeared to be the use of close-fitting internal moulded clips. Each LCD had maybe ten or twenty of these around the inside of each rear moulding. A broken LCD was carefully opened using the expeditious technique of being dropped from about 3 meters. Once the moulded clips had been understood, the somewhat more tedious approach of using a butter knife was invented. This involved starting prising front and rear apart at the bottom of the LCD case (where any initial marks would be less noticable), then working around the bezel until the rear part separated.

THE GUBBINS. With the rear moulding removed, a folded steel cover was exposed. This was held to the body of the LCD by half a dozen M3 screws. Within this cover were two PCB assemblies. One of these boards was the power supply, the other the video scaler/driver sub-system.

A whole article could be written on the subject of the video sub-system, however suffice it to say that the assembly provide an interface between the video input(s) and several very high speed scrambled signal that feed the flat screen display. The data feed to the flat screen panel is generally carried using very fine pitch twisted pair wires. The termination at each end is very fragile, so it has to be removed with extreme care.

Side note: if you want to learn more about the flat panel interface, search for 'flatlink', which is a Texas Instruments product. To learn more about the low voltage differential signalling (LVDS) interface to the LCD, search B133XN01, which has a readily-available datasheet. With some care, it is quite easy to drive LCDs directly once some of the magic has been dispelled.

The power supply for a modern LCD screen is always of a switched mode design, which converts rectified mains (200 or 400VDC) down to the various lower voltages required by the unit. These DC rails generally include 5.0V or 3.3V main rails for the scaler and the LCD panel along with backlight (BL) power. There are two main forms of BL – the older cold cathode fluorescent lamp (CCFL), or LEDs. The former requires several hundred volts peak to peak at a few tens of kHz and the latter need lower voltages at a regulated current. BL power inverters may or may not be mounted on the main PSU board.

Finally, in the case of larger modern ('green') LCD units, there may be an auxiliary supply that is left running to power the minimum circuitry to keep the unit alive when the high power PSU is switched off.

BATTLE OF THE BULGE. In the case of the LCD that was being repaired, a close inspection of the power supply board revealed that several of the low voltage capacitors had bulges in their tops. This is result of their operation at elevated temperatures, age, or manufacturing fault. Once these parts start to fail the resulting self-heating can further accelerate the demise of the part: more on that later. **Photo 1** shows some typical bulging capacitors found on a different PCB.

In the monitor there appeared to be a single type of part that failed (470µF, 25V). Each part was through-hole mounted, so was easy to replace. Every capacitor of this value (bulging or not) was replaced. The total cost for the parts, a small reel of de-solder braid and a quantity of isopropyl alcohol (to clean all of the new solder joints for inspection) was less than £10.

After reassembling the unit, and applying power, the whole display leapt into life and has been completely reliable since this repair.

THE OPERATION WAS A SUCCESS, BUT THE PATIENT DIED. It seemed obvious that a large number of broken items could be fixed with this new-found knowledge, so another LCD was tackled. This was a 28" Viewsonic, with multiple inputs (HDMI, VGA, composite video, component video etc), so quite a useful display. The same procedure was gone through and the unit was plugged back into the mains with some glee and anticipation. Nothing. Something is amiss here!

It still seemed reasonable that the bulging caps could be the source of the problem, but maybe with some other physical manifestation. So the only course of action at this point would be to replace all 30+ critical capacitors in the unit if there was any hope of repair. This seemed a bit bone-headed as a solution.

RESISTANCE IS FUTILE. Further research on the web indicated that a significant failure mechanism of the capacitors was likely to be high ESR (equivalent series resistance). This could be the cause of the overheating, bulging, etc. More interestingly, failed capacitors can still measure something close to their manufactured capacitance and also *look* perfectly normal.

The electrical model of the electrolytic capacitor is a capacitor in series with a small resistor. For caps used for power smoothing applications (power supplies etc), there can be a significant amount of AC current passing through the component. In an ideal world this current should not cause any problems to the capacitor itself, but the real-world series resistance does lead to heating and drying, thus accelerating failure. And, of course, the worse it gets, the worse things become. Heating can lead to gassing and hence the bulging. So where from here?

How about if someone has designed a simple, homebrew ESR meter? Further search located a likely design at [1].

PHOTO 2: My home-made ESR meter, based on instructions found at [1].

Something close to this design was made (more on this, and a more advanced unit, later). One point of details is that the unit uses a probe voltage of around 300mV, which is not high enough to force silicon devices into conduction. This implies that the unit can be used (for the most part) to test capacitors in-circuit (but powered off!).

So, armed with the new tool, each of the electrolytic caps the 28" monitor was checked and a surprising number of small, healthy-looking components were found to have failed. The main reason for the monitor refusing to start was a 10µF reservoir capacitor that had gone high-ESR. This was the main input filter component for the standby power supply.

All failed parts were duly replaced and the monitor did then spring back to life. So, maybe (with a little more humility this time), I thought it might be possible to repair a few more units.

Be aware that there is also the chance that a failed cap could result in unacceptably high supply voltages permanently damaging other circuitry, so searching out and replacing dead capacitors is not a guaranteed fix.

RULES OF ENGAGEMENT. Some quick rules about replacing capacitors. The most obvious one is size; if the new part is too large then the covers of the product won't fit (and this it usually only discovered much later in the re-assembly process). It is OK to replace a part with a higher voltage (original part 10µF 10V, new part 10µF 16V). There is usually also some latitude with electrolytic capacitors for moving up a size in terms of capacity (eg replacing 33µF by 47µF). Bear in mind that some of these parts can have tolerances of +80, -20%, but limits are best imposed based on common sense.

THE ESR METER. The ESR meter mentioned earlier is a 'series' design – the test signal passes through the capacitor under test. The test generator comprises a 10kHz oscillator passing through a 7kΩ to 20Ω transformer. This has about a 19:1 voltage ratio, so for 7V p-p on the primary, around 350mV p-p appeared on the secondary. The secondary is also terminated with 10Ω.

The indicator side is an AC coupled amplifier with a gain of about 35, driving a voltage doubler, a range setting resistor and a display meter. The input of the amplifier is also terminated in 10Ω.

The component under test is then placed between the two 10Ω resistors to form a simple PI attenuator. The higher the ESR of the part being tested, the lower the voltage developed across the input terminator of the indicator amplifier.

I built mine into a small plastic enclosure (**Photo 2**) and powered it by a 9V battery. Total current consumption is about 1.2mA, so should hopefully last more than 60 hours per battery. The only thing left to be done is to calibrate and mark the meter scale. At the moment calibration is done by shorting out the terminals. Good caps then read very close to this line.

Low voltage (less than 50V) capacitors should have an ESR or 100 milli-ohms (0.1Ω) or less. High voltage capacitors tend to have higher ESRs, around 1Ω. And, as they say, all ports between. Capacitor manufacturers generally publish ESR figures for their products and this can make some interesting reading.

In this design of ESR meter, the transformer is the most difficult part to source. Initially a ferrite transformer from an SMPSU was used (with 7V AC at 10kHz fed into the 400V winding). The device appeared to be out of a very high frequency switching unit and while it was happy to ring at 200kHz, it was less than enthusiastic about passing a 10kHz signal. I ended up using a broadband audio transformer (actually designed for seismological work), but a speaker transformer out of an old transistor radio might just work.

The single largest surprise about this project was the response I received when I told several friends what I was doing. Everyone wanted one: quite amazing!

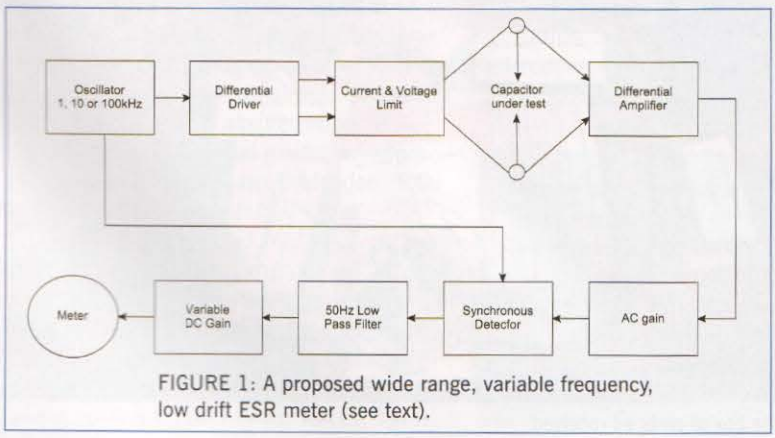

FIGURE 1: A proposed wide range, variable frequency, low drift ESR meter (see text).

AN ADVANCED ESR METER DESIGN. Some thought has been given to a shunt design, ie one that reads 0 for a perfect component. This allows extra gain to be applied at the amplifier so higher resolution may be possible. **Figure 1** shows a proposed block diagram.

A variable frequency source would be useful – say 1, 10 or 100kHz. This source would then drive a differential output stage (like a 26C31), with each output current limited to 10mA and voltage limited to ±300mV with back-to-back germanium diodes.

A four wire arrangement would drive current into the component under test; the tip of the probes would bring separate sense wires back to the indicator amplifier.

The indicator amplifier would be AC coupled and have a fully differential input. Gains would be around x20, and output would be single ended. This single ended output would drive a synchronous detector (driven by the variable frequency source), with alternate input cycles being inverted. This forms the heart of a chopper-stabilised amplifier and has very low DC drift.

A 50Hz low pass filter would remove any out of band noise. This now implies that the detector has limited bandwidth, centred around the excitation frequency. A DC amplifier then takes the rectified DC to a sufficiently high level to drive the indicator meter.

It would be most rewarding to hear from someone who could spend some time developing this idea and publishing a working design.

REFUSING TO USE ELECTROLYTICS. As a closing note, a while ago I did just over a year's contract design work for one particular client. The boss, Geoff, simply refused to allow the inclusion of electrolytics in any of his products. Of the six or so items that I worked on, I can only think of a handful of cases where capacitance / size / cost prohibited the substitution of high density ceramic parts, meaning we had to resort to electrolytics.

Further discussion with Geoff indicated his experience was quite similar to those reported here. Given that his is developing a product that is designed to be in service 10-20 years, his concerns seem well founded.

Finally, if you must use electrolytic capacitors:

- keep them cool, away from hot spots, and/or in the path of some flowing air
- use high temperature rated capacitors where possible (105°C parts are available)
- use double the voltage rating (use a 35V part in a 16V circuit).

WEBSEARCH

[1] http://ludens.cl/Electron/esr/esr.html

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Sienna transceiver kit

A 10W transceiver with optional tuner & SWR board

The finished radio built from the kit.

HOW IT ALL BEGAN. My love affair with radios started in 1953 when I was 9 years old. A neighbour gave me a 'dead' radio with short wave bands. I read everything I could find on radios and was eventually able to get it working. I had discovered the fascinating world of HF. I soon started building my own receivers, each one a bit more sophisticated with more sensitivity and selectivity. I love building electronic devices. When I eventually discovered the world of amateur radio and kits, I was addicted. I cried when Heathkit passed into the great beyond and since then many have come and gone.

SOMETHING WORTH BUILDING. In recent years, a couple of amateur radio kits have entered the market that offer reasonable performance but none struck that magic chord that said 'I must build this'. I recently discovered the DZKit Sienna transceiver kit offered by DZ Company [1]. After a detailed examination of the product, I was hooked. Whilst not inexpensive, I determined that by forgoing lunch for several years, I had to build this radio! I was impressed with the features, flexibility and the implied quality.

I should point out that I have no connection to DZKit other than as a very satisfied customer. This is not a paid endorsement; I only wish to share my impressions on what I consider a very rewarding two month experience. I have thoroughly enjoyed constructing and operating this transceiver.

THE KIT. The Sienna enclosure is 3.5" x 14" x 19" and its compact size is just right for my cramped shack. The Sienna family of receivers/transceivers is advertised as a revolution in amateur radio. The entry point starts with a 'Relatively Inexpensive' (about $1200 US) remote-control only receiver. It uses an external PC to control it with your favourite software, currently including *Ham Radio Deluxe 6.0* and *DXLab Suite* amongst others. A front panel, transmitter, tuner and 100 watt amplifier, as well as numerous IF filters can be added as budgets permit. One can start with any combination of modules to create exactly the ideal radio. The triple-conversion receiver design assures general coverage MF receive with no dead spots and excellent image rejection.

An optional 5kHz roofing filter at the 70.455MHz first IF and compatibility with a wide variety of high performance crystal filters provide outstanding dynamic range. Available Collins mechanical filters at the third IF provide enhanced selectivity and there are innovations in AGC control and band pass filtering with GaAsFET switches instead of PIN diodes. These add the ability to run full duplex and cross-band/cross-mode at HF.

The Sienna transceiver has dual preamps, dual keying (manual and paddle inputs available at the same time), dual audio (headphones and speakers available at the same time). It also has dual receive (front panel access to the audio from an external secondary receiver) and twin backlit analogue meters. Twin microprocessors are used to provide total control of the radio.

The Sienna can be built in several stages and in several combinations. You can even decide on the colour of the front overlay and illuminated front panel controls. I chose a pale Red/ Grey for the front overlay with green illumined push buttons. The complete list of options is too extensive to list in this review, so a visit to DZKit.com is recommended for more detailed information.

STARTING THE BUILD. The kit arrived in a large foam lined box containing bubble wrapped sheet metal bits and five boxes of parts, each box a separate function. Box

This is typically the box of parts as received.

1 contained enclosure hardware, the 2nd had power control elements, receivers, IF filter board and RS-232 components. The 3rd contained the tuner and transmitter. The 4th contained the 10 watt amplifier board and the 5th contained the front panel and control boards. Having been in the aerospace industry for over 40 years, I can recognize top quality PC boards and components no cheap parts used in *this* kit. All of the surface mount parts were pre-assembled leaving only through-hole parts to the builder. The exceptions were a couple of surface mount regulators. All PCBs were clearly silk screened with part identification and orientation where appropriate.

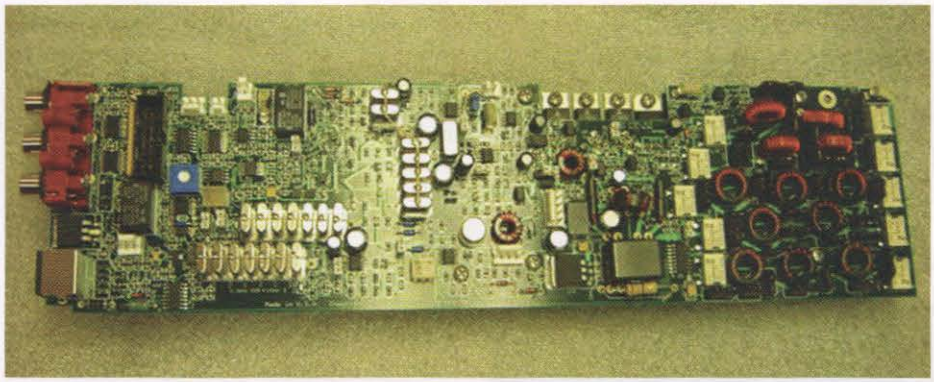
The quality of any kit is reflected in the manual and DZKit uses an 'Interactive Manual' approach, both a printed manual and an electronic manual supplied on a USB drive. The electronic manual includes high resolution colour photos of the board and inserts to aid in critical assemblies. An interesting addition is the inclusion of linked PC board CAD files with a part search function. A couple of the boards are rather densely populated so the CAD file search function was invaluable to identify a part location quickly. A 'Control + F' and the part designator (C2, R5, etc) immediately highlighted the part's location on the PCB. This was the first kit I have assembled with a laptop on the work bench and I found the experience quite rewarding as it completely eliminated any ambiguity on a part's proper location, greatly reducing assembly time and eliminating errors.

The kit did have a couple of recent addenda that were clearly documented including all necessary hardware.

Each bag of parts was clearly labelled and the manual has good drawings of all the parts, allowing easy identification. The toroid coils had clear and concise winding instructions and the only tricky bit was scraping the insulation off the magnet wire without nicking the wire prior to soldering. Both the transmitter and receiver contain modular bandpass filters that required some mechanical assembly.

All cables were preassembled and clearly marked. The RF coax cables used to route RF to other boards are miniature and, whilst small, are quite manageable. At the completion of each board, simple diagnostic tests were outlined to assure proper assembly. The embedded microcontrollers had the operating firmware preloaded. Total build time was a bit over 50 hours.

TESTING. Now for the amazing part. Upon completion of the assembly process (and with some fear and trepidation) I applied 12 volt DC power. The radio performed some diagnostics and self-tuned to 14MHz. Tuning up to 14.160 I heard voices. I was



The completed transmitter board.

dumbfounded: a radio kit that came up and performed as advertised. Of course, there were some minor adjustments to peak the receiver's performance but the clear and concise instructions allowed this to be completed in just a matter of minutes, not hours as expected.

Aside from the multitude of manual controls, the vacuum fluorescent display presents information on the various internal functions such as AGC levels, mic gain, filter selection and filter band pass and offsets. A wealth of information on all functions of the transceiver is available at the touch of the menu button.

SPECIAL FEATURES. I feel I should mention a couple of special features that drew me to the Sienna radio. Of special note is the noise blanker function. Never have I experienced a more impressive noise blanker in any radio I have used. The performance of the blanker is amazing and, whilst not directly specified, I believe it exceeds over 40dB with impulse noise.

The full duplex, cross-band, cross modes using the separate receive antenna input allows one to copy, say, 20m CW whilst operating 40m LSB. The two visual IF band pass functions can 'slide' against each other to set a much narrower bandwidth without the need to purchase additional (somewhat expensive) filters. The high speed QSK function is amazing. It allows one to hear between 'dits' at greater than 60WPM with no 'clicks or thumps'. Whilst I can't copy CW at anything close to that speed, I was still impressed.

'Birdies' are a fact of life in any heterodyne receiver. Careful design and construction can significantly reduce them; however they will always be present to some degree. The Sienna receiver has something called a 'birdcage' function that when enabled will eliminate birdies to a point of inaudibility. This 'birdcage' function can be used to eliminate a close by interfering signal.

Any Yaesu 8 pin compatible microphone can be used with the Sienna. The microphone input supports both balanced & unbalanced inputs.

CONCLUSION. I have thoroughly enjoyed this building experience and love the performance of the radio. Many contacts have commented on the outstanding audio and I am still exploring the many features the radio offers. I had so much fun building the Sienna kit that I am considering ordering one of DZKits 40m AM handheld transceiver kits later this year. It looks like loads of fun.

The DZKit Sienna transceiver kit has provided me with hours of enjoyment during its construction and I expect it will do for years to come. I was excited to recently learn about the newest addition to the DZKit line, the Sedona. It is a companion unit to the Sienna that contains a 12 button keypad for direct access to the Sienna controls, antenna switch, colour LCD volt and ammeter display. It is designed to house optional items such as a Mini-ITX PC, high performance HD sound card and any USB based SDR. It's all powered from a 12V DC power supply and housed in a case styled to match the Sienna. Presently out of my budget, but one has to dream.

[1] www.dzkit.com

Michael Taylor operates as N7RKC in the colonies. He holds an Extra class licence and is a retired scientist with a 40 year career in the field of electromagnetics. He operates from a small farm located at the base of the Rocky Mountains in NE Colorado, USA. That the QTH has the Great American Prairie to the east and the 14,000 foot Rocky Mountains to the west poses operating challenges. He is currently exploring digital modes such as PSK-31 but also enjoys a good QSO on 20m. In addition to designing and constructing solid state amplifiers, exploring new band filter designs, he enjoys experimenting with 'weird' antenna designs. He can be contacted at emwizo@yahoo.com.

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Antennas

Stubs and linear loading

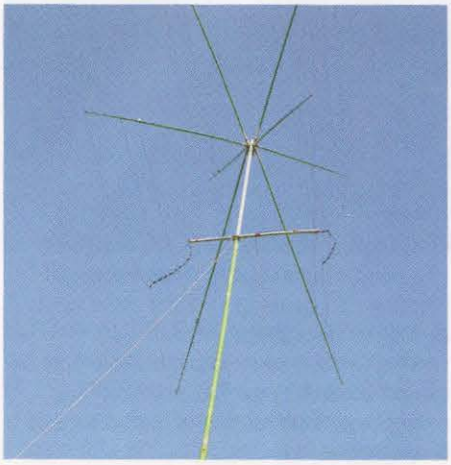

PHOTO 1: Boomless quad for 20, 17 and 15m, using a long stub to tune the reflector on the lowest band (20m).

RESONANT ELEMENT LENGTH REDUCTION. This is a common requirement these days when we try to fit a resonant antenna such as a dipole into the small patch that in many modern houses is allocated to the garden. One of these methods, which I must confess to not having addressed before, is line loading, commonly known as linear loading.

LINEAR LOADING. This method of reducing the physical length of a resonant wire element is achieved by looping the wire element back then forward again. The loop-back sections in the antenna can be constructed from 400Ω ladder line, as shown in **Figure 1**. In this way it is possible to make a resonant antenna as much as 30 to 40% shorter than a dipole for a given band. The arrangement in Figure 1 was designed by K4VX **[1]**. A similar arrangement is described by NN0F **[2]**.

I had instinctively avoided this method of loading an element because it seemed to me that current flowing in one section of the element would be cancelled out by current flowing in the opposite direction; at least over part of the antenna.

I constructed a free-spaced *EZNEC* model of a dipole 60ft long. This value was chosen because it was easier to divide up for the next couple of models I had in mind. The model indicated a resonant frequency of 8MHz, a gain of 2.06dBi (with copper wire losses) and a feed impedance of 74Ω.

A second model was created with added loading sections, as shown in **Figure 2**, with the overall length the same at 60ft. This model indicated a resonant frequency of 5MHz, a gain of 1.48dBi and a feed impedance of 19Ω.

A further model was created with the loading lines at 90° to the main element as shown in **Figure 3**. This model indicated a resonant frequency of 4.9MHz, a gain of 1.37dBi and a feed impedance of 19Ω. This indicates the orientation of the loading lines is not significant and the arrangement shown in Figure 2 is the most sensible and practical.

A short length of transmission line, usually short circuited at one end, is often referred to as a 'stub'. In his description of the linear loading technique, ON4UN **[3]** has this to say: "Linear loading devices are usually installed at or near to the centre of the dipole. The required length of the loading device (in each dipole half) will be somewhat longer than the difference between the quarter wavelength and the physical length of the half dipole. The further away from the centre the loading device is inserted the longer the 'stub' will have to be. The stub must run parallel with the antenna wire to take advantage of any radiation from the stub itself".

A mathematical analysis of the linear loading technique is described by KF2YN **[4]** with a whole chapter (chapter 13) devoted to it. Furthermore, he gives examples of monopole antennas with loading stubs built inside the main vertical tubular elements.

TUNING LOOPS USING STUBS. The method of using a stub to tune a full wave loop is nothing new. The tuning of a full-wave loop as the reflector on a quad can be adjusted for optimum performance using such a device as shown in **Figure 4**. Assuming a loop to be resonant at a required frequency, the stub length 'x' (Figure 4 from **[5]**) required to tune the loop as a reflector on the following bands is as follows:

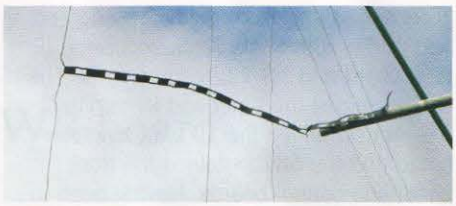

PHOTO 2: Detail of the long stub used to tune the quad on the 20m band. You can probably see where the length of the stub was altered during the tune up process.

40m, 66–77in (1.67–1.96m); 20m, 34–38in (0.86–0.96m), 15m, 19–22in (0.48–0.56m), 10m, 15–17in (0.38–0.43m).

I favour the non-stub approach where the reflector loop is made larger than driven element. This way there is less material to flap around in the wind. However, if you do have a size restriction then a stub may be the answer. For example, the boomless quad for the 17, 15 and 20m bands shown in **Photo 1** was constructed using secondhand fibreglass poles. These poles were originally designed for a traditional quad as shown in Figure 4 but were too short for the non-stub reflector arrangement on the lowest (20m) band.

A long stub of 90in was found necessary to tune the quad reflector on 20m. I was originally concerned that such a long stub might compromise the quad performance but the gain and directivity appeared to be satisfactory. I wondered just how far this quad size reduction using longer stubs or linear loading elements could be taken.

K1KLO **[6]** designed a compact quad system with the use of four linear loading or stub sections. The simplest of these he calls the Maltese Cross and its structure is shown in **Figure 5**. The outer square represents the wire diameter of a full-size standard quad driven element while the inner configuration represents the wire perimeter of the driven element for the Maltese Cross quad. It has a

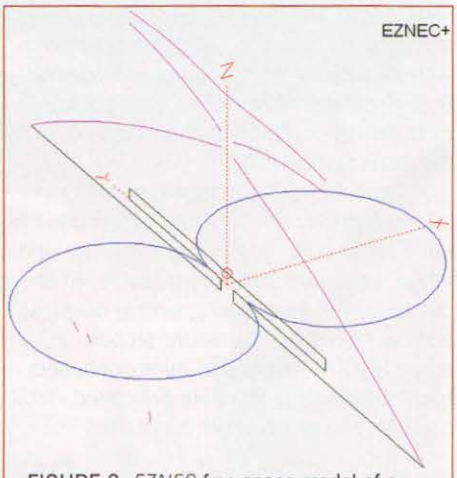

FIGURE 2: *EZNEC* free-space model of a 60ft long dipole with loading sections in line with the main element. The antenna is shown in black, the current distribution in red and the two-dimensional azimuth field diagram in blue.

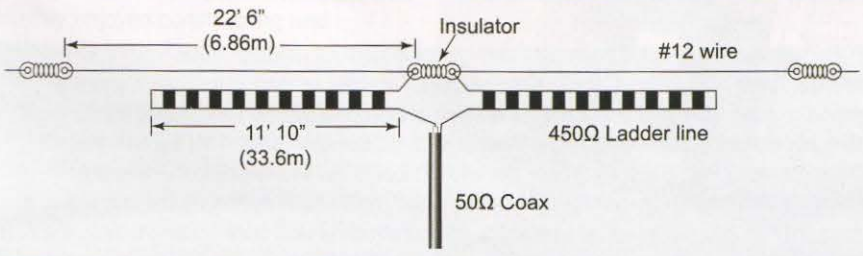

FIGURE 1: The K4VX Linear-Loaded Dipole for 7MHz by K4VX. In practice the main support section is interlaced through holes punched in the windowed ladder line.

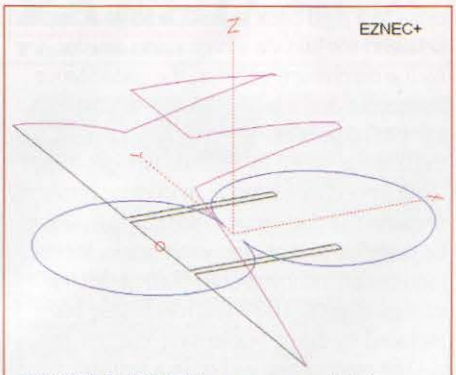

FIGURE 3: *EZNEC* free-space model of a 60ft long dipole with loading sections at 90° to the main element.

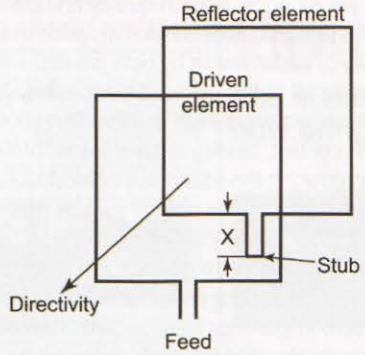

FIGURE 4: Quad design using a shorted stub to tune the reflector, from [5].

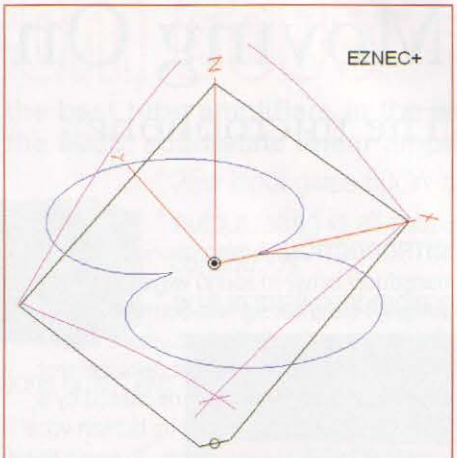

FIGURE 7: *EZNEC* model of a full wave loop orientated in a diamond configuration. The free-space gain of this model is 3.35dBi including copper wire losses and the feed impedance is 122Ω.

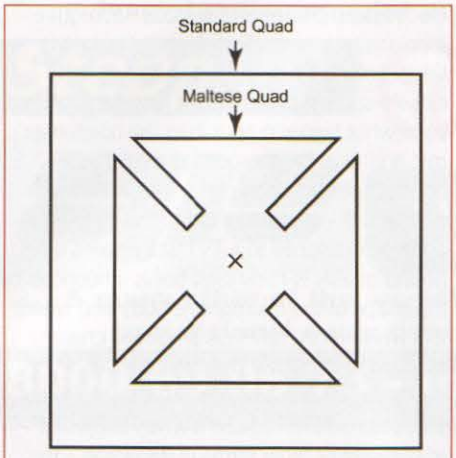

FIGURE 5: Quad loop loaded with four linear loading stubs and described as the Maltese Cross.

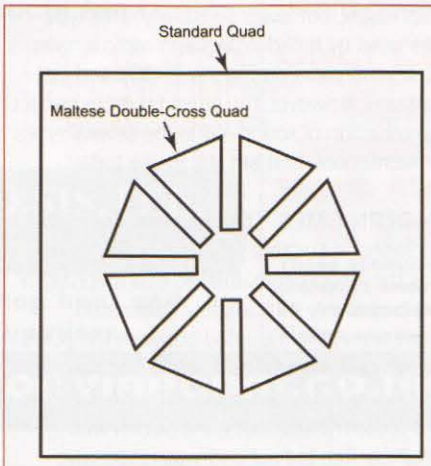

FIGURE 6: Quad loop loaded with eight linear loading stubs and described as the Maltese Double-Cross by K1KLO.

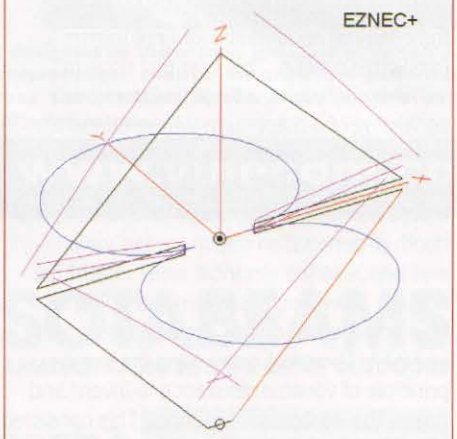

FIGURE 8: *EZNEC* model of a full wave loop orientated in a diamond configuration using loading stubs. The Free-space gain of this model is 2.63dBi including copper wire losses, with a feed impedance of 64Ω.

spreader diagonal only 56% the size of the standard quad element. For example, on the 12m band the standard quad diameter is 14ft 2in (4.3m), while the Maltese Cross diagonal spread is 8ft (2.4m). For a 40m element the standard quad diagonal spread would be 49ft (14.7m), which reduces to 27ft 8in (8.5m) for the Maltese Cross quad.

K1KLO has taken the miniaturisation of the quad a couple of stages further, first by doubling the number of number of stubs to the Maltese Cross to create the Maltese Double Cross as shown in **Figure 6**. Here the extra loading reduces the diagonal spread on 40m from 49ft (14.9m) for the standard quad down to 20ft 3in (6.2m) for the Maltese Double Cross.

No performance figures, either measured or modelled, were available for these miniature quads. To get some idea of the effect of stubs I made a couple of models of full-wave loops orientated in a diamond configuration; one without loading stubs is shown in **Figure 7**. The free-space gain of this model is 3.35dBi including copper wire losses and it has a feed impedance is 122Ω. A second model, with two loading stubs, is shown in **Figure 8**. The free-space gain of this model is 2.63dBi with wire losses and its feed impedance is 64Ω.

Reducing the physical size of a quad loop using some 'additions' is nothing new. The arrangement shown in **Figure 9**, designed by G3YDX **[7]** and G6XN **[8]** is described, in both cases, as capacity hat loading. These devices are not transmission line stubs similar to those described earlier – they are additional lengths of wire connected to the voltage points of the quad.

Not all might agree. The same structure as in Figure 9 is described by G3PLP in the latest antenna book, *The RSGB Antenna File*, as 'Linear Loading'.

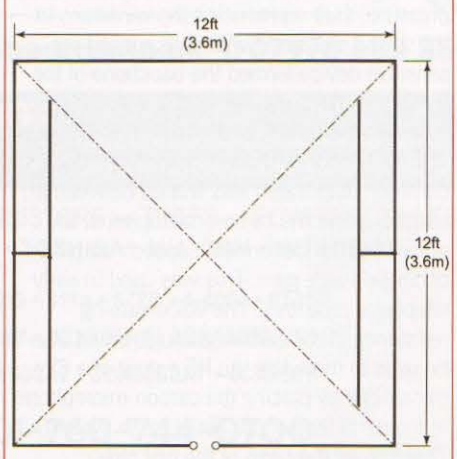

FIGURE 9: Wire capacity loading at the voltage points on a quad element from [7] and [8].

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[4] *The ARRL Antenna Designer's Notebook*, Brian Cake, KF2YN (ex G8FAH)
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Moving On

The microphone

INTRODUCTION. A microphone (mic) is a transducer between sound waves in air and (usually) electrical signals. Sound waves themselves are periodic fluctuations in air pressure and the consequent displacement of air molecules. These can be caused by a wide variety of things including human vocal chords or musical instruments. To sense these pressure or displacement changes a mic usually uses a thin metal or plastic diaphragm, whose movement is coupled to an electrical circuit to produce the electrical signal.

HISTORY. Although early experiments by Alexander Graham Bell and Thomas Edison were capable of transmitting the sound of a vibrating reed by electromagnetic induction, their original apparatus could not transmit intelligible speech. This was first done in 1877 by Bell using a 'liquid microphone', consisting of a diaphragm whose centre was connected to a needle, the point of which dipped into a bowl of acidified water. As sound waves moved the diaphragm and needle, the depth of penetration into the water varied – and hence so the electrical resistance of the contact. However, this was never going to be a commercial device. Nevertheless, also in 1877, Thomas Edison used the same principle of variable resistance to invent and patent the 'carbon microphone'. This consisted of a thin metal diaphragm and a rigid back plate, between which were loosely packed some carbon granules. Diaphragm vibrations varied the contact pressure between the granules and thus the electrical resistance. A small voltage between the diaphragm and the back plate produced a current through the device that was modulated by the varying pressure, thus reproducing the variations in the sound pressure wave. This rugged yet sensitive device formed the backbone of the world telephone system for the next century, although the quality of the sound reproduction was fairly poor by modern standards. If a common diaphragm was shared between an earphone and the carbon microphone, the composite device formed a speech amplifier of considerable gain. This was used in early telephone repeaters. The voice-varying resistance of the carbon granules could also be used to modulate the RF output of a CW transmitter by placing the carbon microphone in the earth lead of the aerial-earth system. This formed the basis of the first radio transmitter for speech.

In the early days of radio (the 1920s and 30s), amateurs took pride in describing their home made equipment in detail, including their microphone. Speech quality and clarity were a prime consideration. This pride in the quality of transmission by both amateurs and professional public service broadcasters led to the development of high quality microphones. In this context, 'quality' means the faithfulness of reproducing the sound as electrical signals.

A variation on the carbon granule method was the 'transverse current microphone', where the diaphragm was made of mica or rubber and the back plate was an insulator. The carbon granules were packed between the diaphragm and the back plate and the current flowed parallel to the diaphragm, ie from side to side. This resulted in considerably improved speech and music quality due to the high mechanical damping of the diaphragm, but lower sensitivity. This type was used by broadcasters and radio amateurs for several years during the 1930s and just post war. However, the quest for more perfect reproduction of sound led to the several types of microphone that are still in use today.

MODERN TIMES. The first really high quality microphone suitable for broadcasting concerts was the 'ribbon' mic. Instead of a diaphragm this had a very thin, slightly corrugated aluminium strip mounted between the poles of a powerful magnet. Unlike a diaphragm, which inevitably has some stiffness resulting in a resonant frequency, the ribbon was relatively free to float and was responsive to air movement rather than fluctuations in air pressure. Although capable of superb sound quality over an extended frequency range, its body was rather heavy and the aluminium strip was susceptible to shock and wind damage. It also had very low source impedance and output voltage, requiring an adjacent ('head') preamplifier. These were significant disadvantages in the days of valve amps, which often suffered from mains hum and noise. However, these problems could be alleviated by using a high ratio step-up transformer between the microphone and its preamplifier. Putting a small transistor amplifier into the body means the ribbon mic survives in some applications to the present day.

The moving coil mic was contemporary to the ribbon mic and a close contender in quality. Unlike the carbon type, it required no polarising voltage. Its output is sufficient to drive a modern transceiver through several metres of screened cable without the need for a head amplifier. It works by inducing an EMF into a small coil that sits in the annulus of a specially shaped powerful magnet, the coil being attached to a metal or plastic diaphragm – rather like a miniature loudspeaker. It is capable of good quality, can be made quite small (less than 25mm in diameter) and is one of the commonest types in use today.

Another high quality microphone, but one that has gone out of fashion, is the 'condenser' (or capacitor) mic. This has a lightweight metal or metallised plastic diaphragm mounted close to a rigid back plate. A voltage is applied between the two via a high value resistor. As the diaphragm vibrates, the capacitance between it and the back plate varies in sympathy, generating a minute voltage across the resistor. It cannot be used without a high input impedance head amp in close proximity because the tiny capacitance changes would be dwarfed by that of any mic cable. It also requires an inconveniently high polarising voltage of up to 100V and has largely been replaced by the self-polarising 'electret' mic.

The electret mic works on a similar principle to the condenser mic and comes in several forms. It too uses a thin plastic film as its diaphragm, thinly metallised on its outer surface. The plastic film carries a permanent electrostatic charge and so does not require a polarising supply. The electrical output is taken between the metallised film and the closely-spaced back plate. It is capable of somewhat higher output than the condenser mic and usually incorporates a single-FET head amplifier into the body. It can be made quite small – a few mm diameter – and is often seen clipped to a TV interviewer's lapel. Sound quality is fairly high but is influenced by the shape of the microphone body and where it is worn. It can be mass produced cheaply.

Another relatively common form of microphone uses a piezoelectric crystal. This produces an EMF across it when subjected to pressure or other forms of distortion – the same principle as that employed in the quartz crystal used to control RF oscillators. The most common sort of 'crystal' mic uses a diaphragm mechanically connected to the crystal (with the attendant problems of diaphragm resonance), though a higher quality version (with a much lower output voltage) uses direct impingement of the sound waves upon the crystal. Both types produce a rather lower output than the electret mic and usually require an integrated head amplifier.

All microphones have a 'polar diagram of sensitivity', much like aerials, which depends on the shape of their housing and whether they are mainly sensitive to variations in air pressure or air velocity.

There are also various kinds of optical microphone that use optical fibres or lasers to sense the vibrations of a diaphragm, but these have not yet found much application in amateur radio.

AMATEUR MICS. There is little point in the modern amateur using a high quality mic because of the extensive filtering that is now usually used to achieve a minimum bandwidth. This narrow band filtering applies to both transmitters and receivers in the interest of 'punching through' the QRM using as little spectrum as possible.

CORRECTION. It has been pointed out that water ionises as $H_2O + H_2O \rightleftharpoons H_3O^+ + OH^-$ and not in the way suggested in May's column.

July 2014 • RadCom
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HIGHLIGHTS. In 2014, the RSGB will be hosting the most important IOTA event in the last 20 years: the RSGB IOTA 50th Anniversary Convention. IOTA enthusiasts from 18 countries have already booked and they include a host of well-known DXpeditioners who between them have activated several hundred IOTA groups. If ever there was an opportunity to hear first-hand about their exploits, this is it. The event has been kindly sponsored by Martin Lynch & Sons and we, once again, thank him for his support of both the RSGB's IOTA programme and the amateur radio hobby.

DXCC card-checking will be carried out by Lionel, G5LP. However do alert him in advance if you propose to bring cards. CDXC will also have a stand

PROGRAMME HIGHLIGHTS. The weekend starts with a barbecue on Friday when visitors will have the chance to mingle and put faces to names or meet up with old friends. The Saturday programme will feature a report on the IOTA Marathon, held over 2012 and 2013, which was an on-air lead-in to the current celebrations. Cezar, VE3LYC who headed the event adjudication board will speak about his experiences, both as chief adjudicator and as a serious participant. Prizes will be presented to those winners who have made the journey at the Gala Dinner.

Another highlight has to be the talk 'Highlights of IOTA's 50 Years and More to Come' by Roger, G3KMA, who has been the RSGB's IOTA Manager since 1985. This will be a trip down memory lane that expands on the future direction, opportunities and challenges facing the programme. Many in the audience will be eagerly awaiting news of the 10 new IOTA groups to be announced during the day, including the two successful candidates that the attendees themselves will have nominated. This will certainly stimulate discussion among the guests – it is hoped that none race off for an early flight to get a head start to activate a new one!

Ghis, ON5NT will talk about his CW5F operation from Timoteo Dominguez Island in Uruguay when the storm surge nearly over-topped the island. Cezar, VE3LYC will follow with an even scarier story when, with the small LU6W team, he landed on Escondida Island, the last remaining previously un-activated IOTA group in South America. You will hear why it has taken so long for radio amateurs to get there. Don, G3XTT will tell us the inside story on the recent TX6G operation by an all-British team from Raivavae Island in French Polynesia. We will also have presentations by Christian, EA3NT on the Invoker Team's very successful HPOINT operations from the six IOTAs in Panama and TKxINT ones from three IOTAs in Corsica. Ed, GW3SQX will talk about the IOTA Contest and the contribution that this has made to the success of the IOTA Programme in the last 20 years and the potential for an even greater one in the future. There will also be opportunities to talk about different aspects of the IOTA experience, including the financing of DXpeditions and QSLing.

PLACES STILL AVAILABLE. The IOTA 50th Anniversary Convention will be a truly international celebration of IOTA and an event to remember. Come and mingle with well-known island enthusiasts both from the UK and overseas and celebrate 50 years of the IOTA programme with the RSGB.

More information can be found at www.rsgb.org/iota50

Important Note:

Day Visitor Tickets should be booked in advance at www.rsgbevents.org

Day tickets cost £15 online before 30 June but will be £20 on the door, so advance booking is highly recommended. Packages, rooms and dinners are still available and these can also be booked at www.rsgbevents.org

IOTA 50th ANNIVERSARY PROGRAMME

Friday

5pm Welcome of the Guests
7.15pm 50 Years of IOTA Barbecue Party with contributions from the guests about their experiences in IOTA and recollections of DXpeditioners' highs and lows

Saturday Morning

9.15am Formal opening by John Gould, G3WKL, RSGB President
9.20am CW5F, Timoteo Dominguez Island by Ghis Penny, ON5NT
9.50am The IOTA Marathon or the 623 IOTA Success Story by Cezar Trifu, VE3LYC
10.35am Coffee break
11.00am Rule changes and additions of New IOTA Groups by Roger Balister, G3KMA
11.45am HPOINT/x – Panama IOTA Tour by Christian Cabre, EA3NT
12.20pm IOTA Contest by Ed Taylor, GW3SQX, IOTA Contest Committee

Saturday Afternoon

1.00pm Lunch
1.45pm Highlights of IOTA's 50 Years and More to Come by Roger Balister, G3KMA
2.15pm RRC–20 and IOTA–50, a commemoration by the Russian Robinson Club
2.45pm TX6G, Raivavae Island, Austral Islands by Don Field, G3XTT
3.15pm LU6W, operation from Escondida Island by Cezar Trifu, VE3LYC
3.45pm Coffee break, with entertainment by the Chobham Morris Dancers
4.30pm Corsica IOTA 2013 – TKxINT activities by Christian Cabre, EA3NT
5.00pm QSLing and Financing of IOTA operations
5.45pm End of Afternoon Session

7.15pm Gala Dinner

A tribute to IOTA by John Gould, G3WKL, RSGB President
Presentation of Awards
Musical Entertainment by David Lingwood

Sunday Morning

9.15am Decisions on Remaining 2 New IOTA Groups
9.20am Taking of Raffle
10.00am Formal End of Convention

Saturday Partners' Programme

9.30am Short coach ride to Windsor
3.15pm Return to the Beaumont

Sunday Excursion (outside the formal programme)

11am River Boat trip for those who want it and other local excursion (a charge will be requested on the day).
TBA Return to Beaumont

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Red Star

СОЮЗ ПРОЕКТ (the Soyuz Project)

PHOTO 1: The completed Soyuz Red Star ATU with a MFJ-904H (top) and Cubic ST-3B ATU for scale.

INTRODUCTION. The idea to build a new and better antenna tuner was born as I was not completely satisfied with my 2kW S-Match. The S-Match design is very solid, uses very few parts and is a very well balanced tuner design, specially intended to work with balanced line fed dipoles or other balanced antenna systems. However, sometimes, if you want to use a balanced antenna you will have to adjust the length of the feed lines a bit to get a good match on all desired frequencies. That is not the way I wanted to solve this tuner problem. The antenna tuner has to tune the antenna; I do not wish to tune the antenna to the tuner.

The problem with the S-Match is that it is very difficult to build one for 10 – 80m that will tune both of my antennas on all these bands. The S-Match (QRO-proof and tested up to 1.5kW) plate capacitor had a too-high minimum capacity and it just wouldn't get a good match on 10, 12 and 15m.

The other reason is that with my V-dipole, the ladder line is the cause of 90% of the 6-8dB losses on 80m. Lengthening the feed lines would lead to more losses, shorter would mean I would have to put my antenna tuner up on the roof, not very practical as it would be rather difficult to reach the knobs!

The finished item is shown in **Photo 1**. It is a lot of tuner in comparison with the Cubic ST-3B and the MFJ-904H.

Both my antennas are fed with 11m (34ft) of homebrew 600Ω copper braid 2.5mm square (AWG13) ladder line. The spacers are 4 inch wide rose-clips.

One of the balanced lines feeds an aluminium doublet that has V configuration of 7m (22ft) on each leg. The other identical balanced line feeds an inverted-V wire dipole with 2 legs of 12m (38ft) each; both legs are coupled to a spider web coil totalling 8m (25ft). That is done to electrically lengthen the dipole halves. **Photo 2** shows of one of the 2 spider web coils, and one with my V-dipole in the background. The black plastic 4 inch (100mm) spiders in both my 'antenna webs' are just for fun.

On 80m I usually Tx on my spider web dipole and Rx on my V-dipole. This is because the V-dipoles receiving direction differs from the spider web dipole and picks up a lot less QRM from electronic devices in my living area. The spider web dipole however has a lot less feed line losses on 80m due to the higher antenna impedance there. Switching between the antennas is done by a homebrew automatic antenna switch controlled by my transceiver's Tx-ground out.

Both antennas have their own balanced tuner, but normally the big tuner tunes the Tx antenna and the Cubic ST-3B does the job tuning the Rx antenna because tuner losses are not that important when receiving as long as the signal to noise ratio stays good.

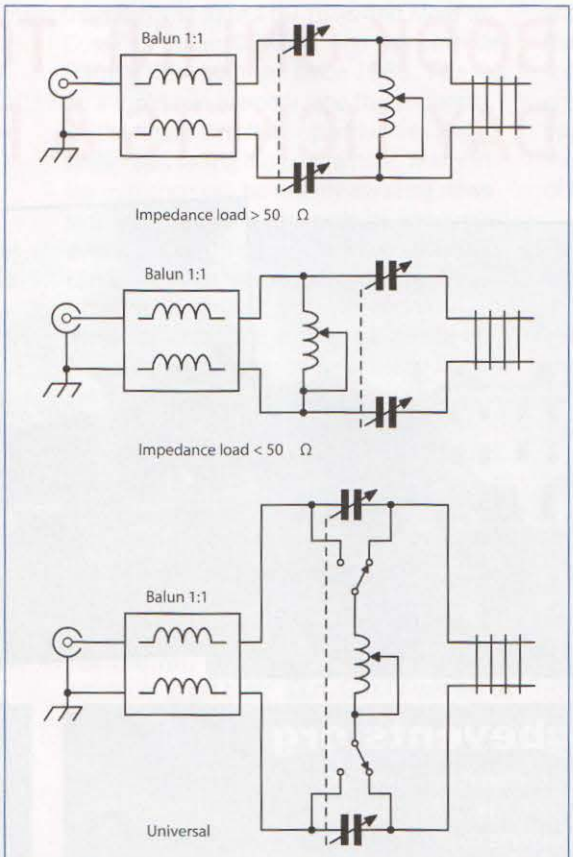

FIGURE 1: The three configurations of the double-C tuner.

DEVELOPMENT. I first thought I could better buy another tuner, but that wouldn't be the true ham spirit-like, would it? So I started thinking about a new design for a tuner that would solve most of my problems.

I had some discussion and e-mails with Bob, ON9CVD, who has theoretical skills and big technical knowledge in calculating losses in different tuner and antenna designs and the pros and cons between different ATU designs and construction. Together we considered which tuner design would fill my needs best.

Eventually it turned out that the double-C tuner would be the most effective tuner to make the least amount of losses in tuning both my rotary V-dipole on 80 and my spider web dipole on 80 with the best overall performance and balance. It is switchable between three different configurations, as shown in **Figure 1**.

But there were problems in this setup. The double-C tuner needs the inductor switching to get from low-Z antennas to high-Z antennas; also, it needs some extra capacitors to be added on the low bands. Also the problem of not being able to tune bands like 10, 12 and 15m could still occur.

I tried to find decent switches for this purpose but didn't succeed. If you do not use the best and bulkiest switches you could end up destroying the hard labour you did in trying to

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* Mobile sucker mount may not be supplied with standard model.

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Jos van den Helm, PA1ZP • e-mail: pa1zp1@gmail.com

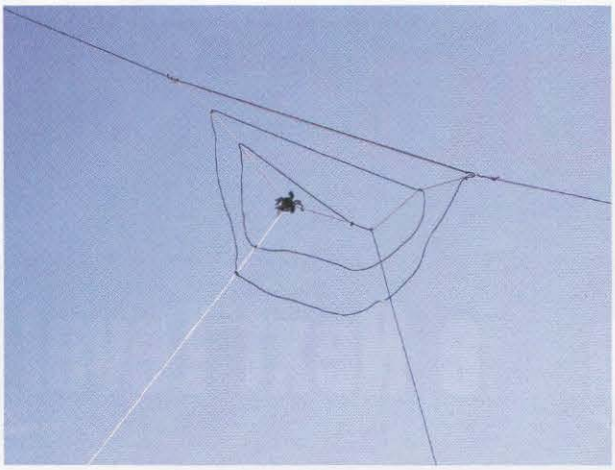

PHOTO 2: The centre of my 'spider web' antenna hints at how it got its name.

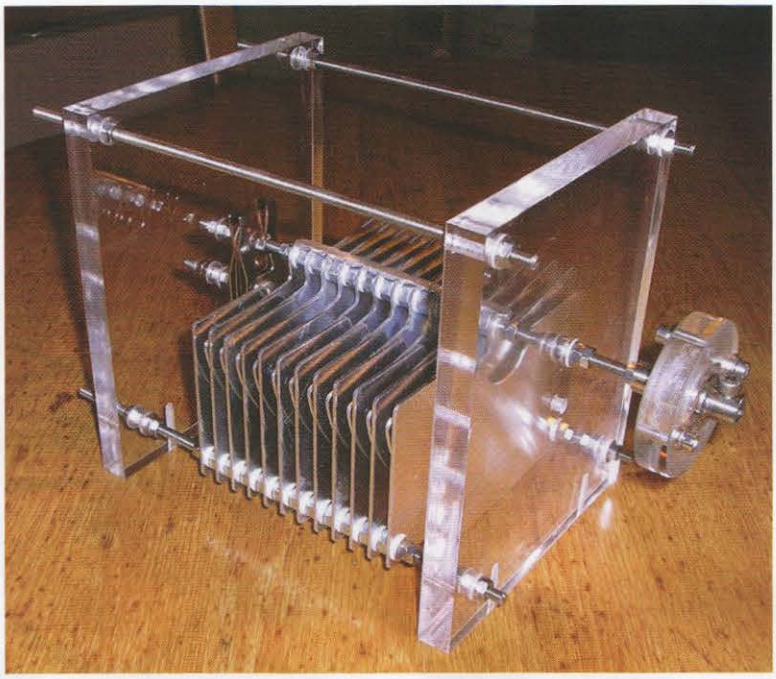

PHOTO 3: One of the homebrew 22-450pF airspaced variable capacitors.

keep losses as low as possible in the tuner parts and then create losses in the switches or, even worse, sparks and smoke in these parts. I already have practical experiences of this in the past, in blowing switches and relays in my remote controlled tuner and I wasn't planning to go that way again.

Also in the past I had arcs in my S-Match when a ceramic 2kV 50A RF switch started arcing. Even the 3kV air capacitor started arcing some times on very high power on 40m. So we started looking for a better option with fewer parts and/or no switches.

Then I stumbled on the MFJ-9982 circuit that could be built without any switch at all. This tuner is a floating T-match with a balun between the floating T-network and the transceiver, as shown in **Figure 2**. The circuit also could be used as an unbalanced tuner by simply placing a connecting strip on the back of the tuner. That will connect the inductor to ground and then it is a normal unbalanced T-match. Just hook up a coaxial fed antenna to the coax connector and you are in business.

To keep out the switches you do have to disconnect the balanced wire if you use the tuner as coaxial tuner. If you want to go back to balanced tuner you also need to disconnect the coax.

It was a bit of a compromise between perfect balance and ease of building and the fewer parts that I needed to build the T-match. Also there was no need to switch extra capacitors if needed like in the double-C match or in the S-Match. And there were no problems to be expected in tuning the higher bands from 10-15m. So a T-match it would become.

I was planning to build most parts myself, but for the variable inductor I would use the Russian army surplus 29µH inductor from my S-Match. I couldn't build that so good in quality and rigidity myself. And even if I could I would have to construct and build the machine to bend the copper strip into a coil, so the cost would be far higher as the Russian inductor ever cost me.

I also wanted to re-use the SWR bridge from my S-Match that had two power ranges, 200W and 2kW.

CONSTRUCTING IT. First I started to build the inner guts of the future tuner. The plate capacitors were built first, because these parts together with the inductor would be the main indicator of the size of the cabinet I needed. You do *not* want to build a cabinet and find out after the building that the parts won't fit in!

For maximum efficiency I welded the aluminium capacitor plates of both the rotor and the stator so conductivity would high and losses as low as possible. I also gave good attention to the copper-bronze sliding contacts that they would be large enough and wouldn't build up resistance or that they would spark and make bad contacts in a while these contacts are helped with similar sized stainless spring steel pusher plates.

The capacity of these plate capacitors is 22-450pF and plate spacing is 3mm (about 1/8 inch).

It was needed to balance the rotor of each capacitor with a 6mm (1/4 inch) thick stainless steel balance plate. It has the same shape as the rotor plates but is mounted outside the Plexiglas side panels of the capacitors and is placed at 180° opposition to the rotor plates.

The capacitors became rather large and heavy. Their size, including the isolator and stainless steel balance plate is 15cm wide, 18cm high and 28cm deep (6 x 7 x 11 inches). **Photo 3** shows a completed capacitor (minus its balance plate).

CABINET TIME. Having the most bulky parts ready and available, I could now start to design the cabinet.

For me, it had to be 'something else' and a bit different from the usual aluminium or steel plate cabinets that commercial manufacturers use to house their tuners. It also had to fit in style with my 4 square controller and my noise canceller that have cabinets made out of laser-engraved brushed stainless steel.

The cabinet had to be big and it had to be strong because all inner parts together were about 12 kilos now. The size of the cabinet had to be 50cm wide, 25cm high and 40cm deep on the *inside* of the cabinet (20 x 10 x 16 inches).

All parts were to be installed on a 2mm thick aluminium mounting plate that would be screwed to the bottom of the cabinet. I also chose to make the front of the tuner as a separate part so it was easier to make. It also was simpler to assemble the guts of the tuner and the gears for the inductor counter if the

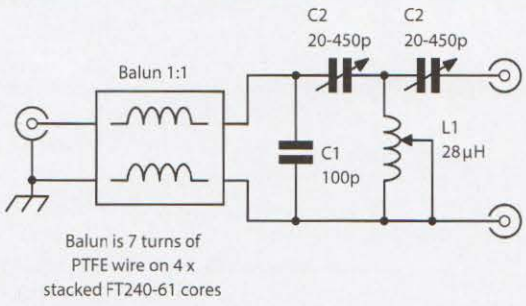

FIGURE 2: Circuit diagram of the Red Star ATU, based on the tuner section of the MFJ-9982.

PHOTO 4: Andre Kuipers' signature: original rather dark photo from a door, the handmade CAD file and as finally laser-engraved on the top panel.

front was a separate part. I also wanted a reading scale for the variable inductor so that I could see perfectly the exact turn it was on, and I designed a 1 : 25 gear reduction counter specially for that purpose.

It needed a lot of engraving for the scales of the capacitors and inductor.

One of the two big gears required is engraved with all the numbers of the turns of the inductor and the CAD design drawing is shown in **Figure 3**. The finished product sits behind the front panel and can be seen through the front panel above the central knob. The front panel pointer shows the coil position and the engraved gear shows the turn number. It has become a nice detail and very useful help in setting the tuner: I can accurately repeat settings in a matter of moments.

Then there was an 'other' problem. This cabinet would have a cover on it of 50 x 42.5cm (20 x 17 inches). What a waste of empty space. To solve this problem I came up with the idea to engrave the top cover in honour of our Dutch cosmonaut Andre Kuipers, who was aboard the ISS at the time of construction and design of the tuner and its cabinet.

So in honour of him and his flight to the ISS in the Russian Soyuz, so I decided to call the tuner Soyuz.

I also borrowed his autograph from a picture on the internet and digitised it. The original signature was in a rather dark photo of a door located in Russia. It took a while in *Photoshop* to detail out the autograph and then to make a DXF file of it. It has its own dedicated place on the top of the tuner now. I added some more graphics including a picture of a Soyuz-T (transport) spacecraft and a large star logo cutout. A red Plexiglas plate glued inside to the inside of the cover adds a nice colourful detail. **Photo 5** shows the finished top cover.

The text is to honour Andre Kuipers' achievement: he is a Dutch cosmonaut. I have to tell you all, that all engravings and pictures and text are purely for the looks and do not have any political meaning. The Russian text and signs are just there to add to the "secret touch and looks" of things and for fun and decoration. That it is in Russian is just because learning the Russian language is one of my hobbies. And it is certainly not the most successful hobby, but it is a very fine way to pass time and learn more about this great unknown country and its culture.

I decided that it would be impossible to find nice matching knobs to such a cabinet, so I also made and designed these myself.

After the production and mounting of all parts I found out that the first balun wound on two stacked Amidon T300-2 cores didn't have enough impedance and balancing power. The windings were only 11μH and that wasn't enough. So I wound a second balun with the same 6 parallel twisted Teflon wires on 4 stacked FT240-61 cores. That did the job. The balun has now 2 windings of 7 turns that are 40μH each and for me it does a fine job in balancing the loads.

Wiring throughout the tuner between parts was done with 16 x 1mm red copper strips, again to reduce losses and the coupling of my balanced lines can be done with soldered rings or with plugs going directly in to drilled 4mm holes in the 8mm struts on the tuner balanced couplers.

Photos 6, 7, 8 and 9 show general views of the tuner. At the time the photos were taken I still had to complete the connecting plate for unbalanced use and the connections to the unbalanced antenna connector.

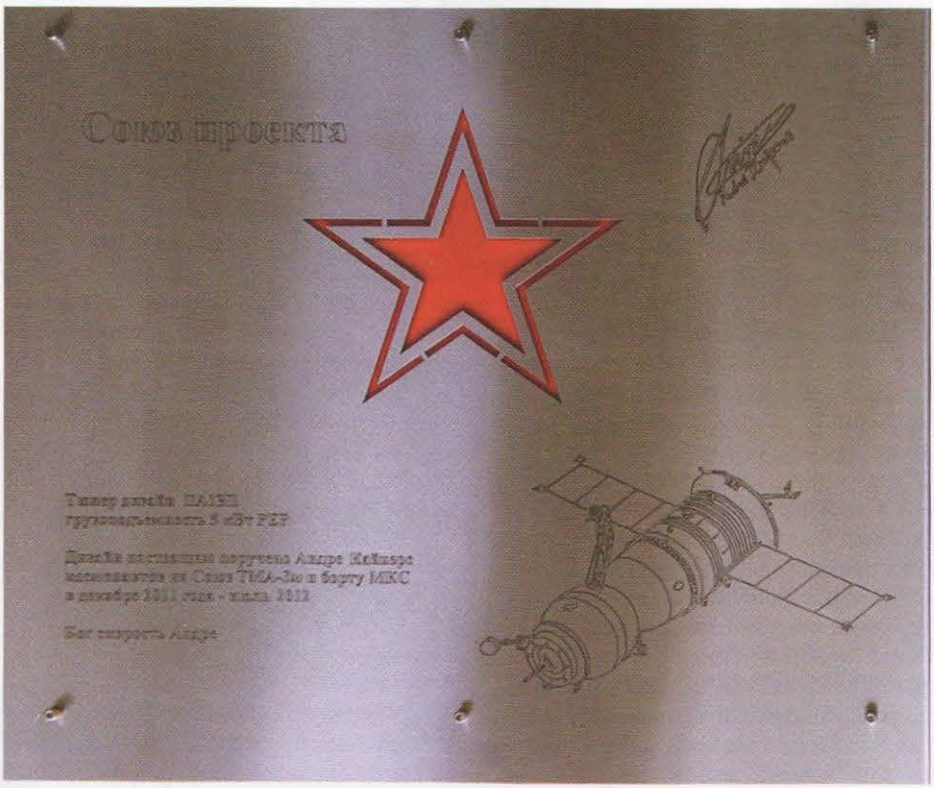

PHOTO 5: The top panel combines laser-etched graphics with a striking cutout backed by red plastic.

CONCLUSION. All in all it was a very fine project to build and I am very pleased with the results so far. The tuner manages to tune both of my antennas from 80-10m without sparks or smoke or burned fingertips from the controls due to RF voltages. It does this without troubles, even when I use my Ameritron AL572B that can output 1300W PEP.

All graphics on the tuner was done by laser-engraving with oxygen gas and these

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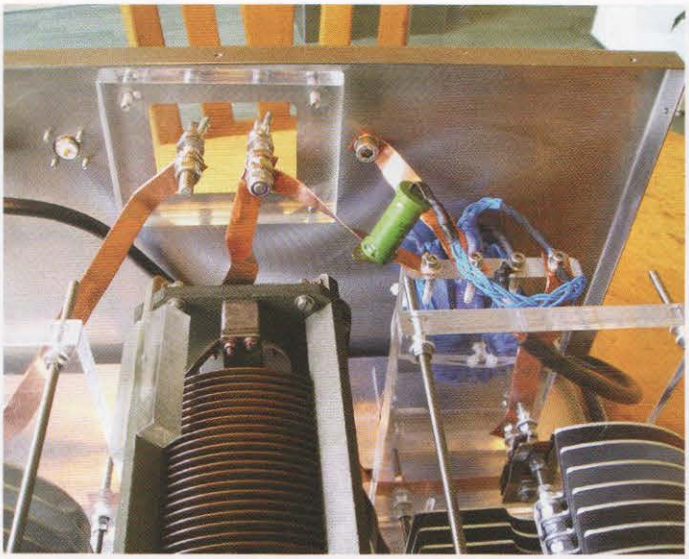


PHOTO 6: Inside the back panel. The balun with its blue wire windings is on the right, behind the variable capacitor.

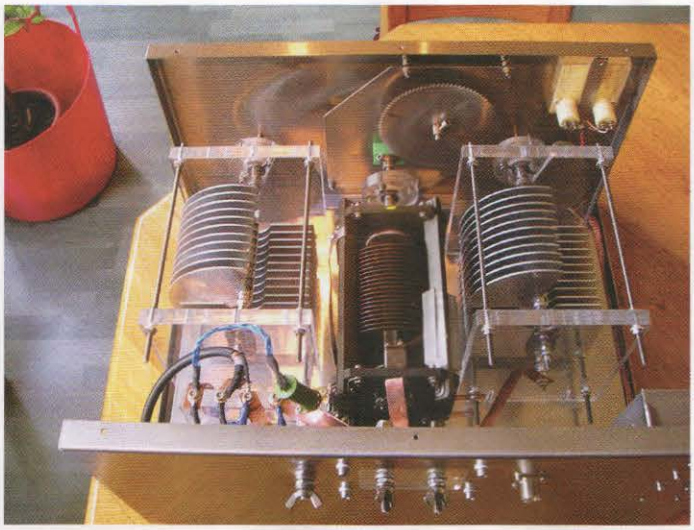


PHOTO 7: Looking towards the front panel. The 6mm thick semi-circular stainless steel counterbalance weights can be seen at the far end of the variable capacitors and the variable inductor is in the middle of the photo.

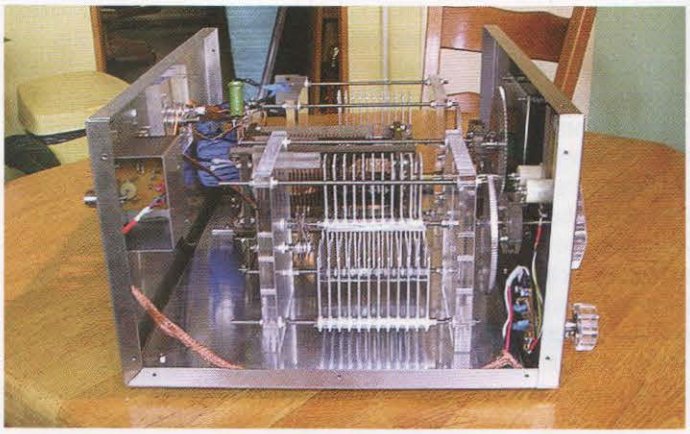


PHOTO 8: Side view showing some of the gearing plus the shielded cable running between the front panel SWR switch and the electronics on the rear panel.

PHOTO 9: The most striking feature of the minimalist rear panel is the clear acrylic insulating sheet that carries the balanced output terminals.

engravings cannot be removed, even if I would sandblast the cabinet. All hardware and nuts and bolts are stainless steel so rust is not a problem. The tuner is a bit heavy with a weight of 23.5 kilos (about 50 pounds) but it isn't intended to be portable.

There is no need for painting or so forth. I just wipe greasy finger marks or dirt away with a soft cloth moistened with WD-40 or some soapy water.

I hope that this tuner will serve me as long as the Soyuz served (and still serves) the Russians. That craft had its first launch 1967 and its descendants are still going strong, taking numerous people in space and back every year.

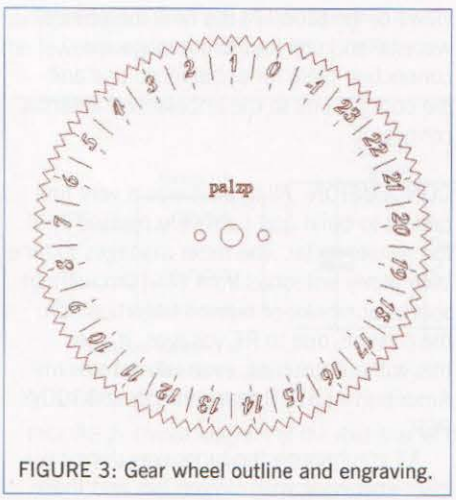


FIGURE 3: Gear wheel outline and engraving.

THANKS. A special word of thanks to Bob, ON9CVD for his great help in calculation and discussing the expected troubles with various tuner designs. I also want to mention Frits, PA0FRI, who on his website has numerous articles on homebrew antenna tuners and antenna building. His website with all well tested documentation is of great help for many of us, who want to build or improve their antenna tuner or antenna. Do not hesitate to visit PA0FRI website, it has lots of tips and tricks about how to improve your homebrew projects and has fantastic practical tips on how to do it. It helped me a lot in several antenna designs and in building my original S-Match.

And a big thank you to the men at the company GPM in s'Hertogenbosch, who let me use all their high tech machinery for free if machines were not needed for production, like the laser cutting and engraving machine, the welding machines, drilling machines, plate bending machine, etc in building this bling bling antenna tuner project for material costs only. Special thanks to Dimitri and Laurens, whom helped me by operating the laser cutting machine in their own free spare time.

And last on this, list is the appreciation for the Dutch long duration in space record holder cosmonaut Dr Andre Kuipers. Welcome home **космонаьт Андреи** (astronaut Andre) and thanks for the inspiration you gave to many Dutch people with your stay in space, to invite everyone to try to make their dreams come true even if they seem to be not of this earth or on this earth. He safely returned home with the old Soyuz after a stay of over 6 month in the ISS. I will end this article with a quote from Andre: *"A Soyuz will always get you back home again"*.

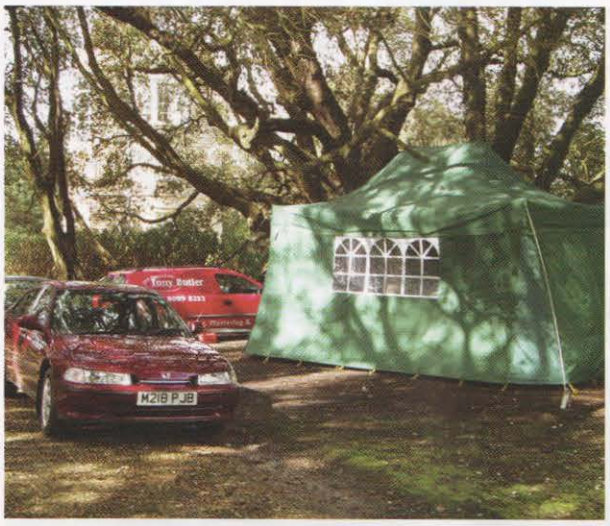
International Marconi Day

A number of stations took to the air from historic sites on 26 April 2014

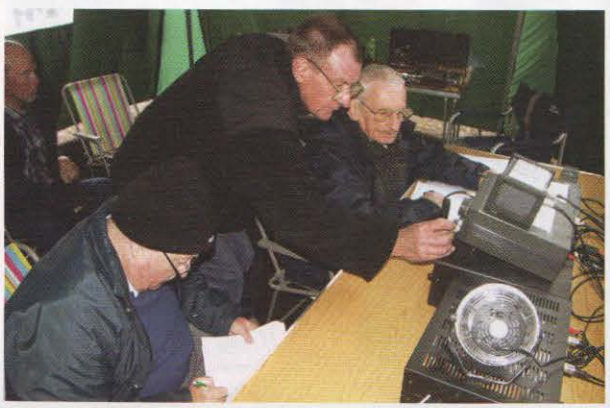
BACKGROUND. International Marconi Day (IMD) is held annually – 2014 was the 27th event – to celebrate the birth of Guglielmo Marconi on 25 April 1874. It is organised and run by Cornish Radio Amateur Club (http://g4usb.net/IMD/). International Marconi Day is an opportunity for amateurs activate sites with an historic connection to Marconi (registered award stations) as well as gives amateurs worldwide the opportunity to contact these stations and apply for various IMD awards. Although technology has moved on from Marconi's day, the event still promotes point-to-point contacts on the HF bands.

The event is held on a Saturday, close to Marconi's birthday and in 2014 there were over 60 award stations set up around the world. In the early years Marconi carried out his experiments at Poldhu, including the historic transatlantic signals on 12 December 1901. The Cornish Radio Amateur Club station represents his Poldhu operations and other activities carried out locally.

LUTTRELL'S TOWER. Every year since 2006, a small group of radio amateurs, in cooperation with The Landmark Trust, has set up a radio station adjacent to Luttrell's Tower at Calshot, Hampshire, in order to join other radio amateurs in celebrating International Marconi Day. Radio stations with special cal signs (in our case GB5LT) are set up at locations which have a significant connection with Marconi's technical operations. Between 1911 and 1916 Guglielmo Marconi, the famous developer of radio communication, lived with his family at Eaglehurst and used the top room of the neighbouring Luttrell's Tower as his radio laboratory.



Tent for GB5LT operations. Lettrell's Tower can be see through the trees.



GB5LT operated by Robin, G0OSG, Tony, G6MNL and Tim, G4YVY.

The Luttrell's Tower Special Event station was operated on Saturday 26 April by a group belonging to the Waterside New Forest Radio Club. There was a slight delay in starting, owing to necessary last minute modifications to the tent used as a 'shack' by our radio amateurs to protect them and their equipment from the weather. However, once the equipment was installed and working efficiently, large numbers of radio amateurs elsewhere in the UK and Europe immediately strove to make contact with our station, thus showing that we were producing a strong signal. Those radio amateurs, who make a sufficient number of contacts with the various special Marconi stations, are able to claim an award from the organising group (http://g4usb.net/IMD/) and many amateurs are keen to achieve this.

The amateurs involved in the exercise this year were: Tim, G4YVY, Gordon, G1ZEC, Robin, G0OSG, Tony, G6MNL, Mel, G0FOH and Rod, G6LVJ. The transceiver used was Tony's Yaesu FT-747 with a transistorised linear amplifier producing between 150 and 200 watts, all powered by Tony's portable generator. The aerial was a full-size G5RV, running roughly north–south, used for the first time last year during International Marconi Day.

The weather was relatively kind to us during the day, producing a little sun and occasional showers, rather than the continuous heavy rain that had been promised by weather forecasts. However, the southerly wind became ever stronger, with 30mph+ gusts coming at us directly off the Solent, over which Luttrell's Tower looms. This meant (and it happens every year!) that our intrepid radio tent-dwellers ended up bundled in several layers of winter-type clothing, with kind people providing regular hot beverages.

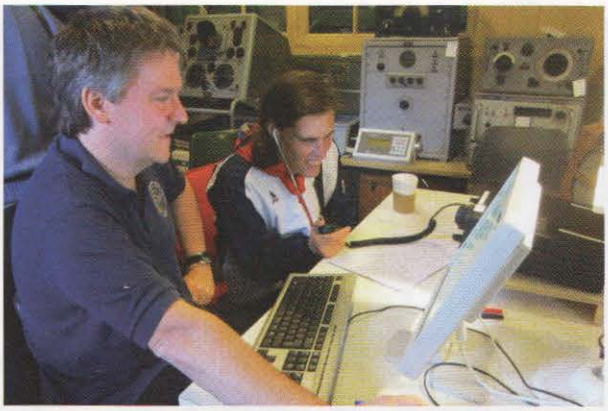
Our on-air activity was very busy throughout the day and the operators and scribes needed to be relieved regularly! We remained the whole time on the 40m band and had a total of 229 contacts, including Mike, F8VOU (alias G4HXT, a founder member of the Luttrell's Tower IMD event). He said he had great difficulty in breaking through the pile-ups! Notable contacts included several QRP stations; John, G2FSR in Brighton, GB0GPF (Grey Point Fort, WW1 Coastal Defence Battery, Northern Ireland); GB0YAM (Yorkshire Air Museum, York); GB1BM (Brooklands Museum); Keith, G0CXP/M in a narrow boat on a canal near Birmingham; Grahame, OZ1QV on Falster Island, Denmark; Geert, ON7TWA/P camping near Antwerp; GB0IMD at Brean Down and DA0IMD a club station on Borkum Island.

During the day at Luttrells, they had been able to make friendly contact with the residents in the tower and they were very interested in and impressed by the IMD radio station. At the end of the day, the group members agreed that the exercise had been hard work, but well worth while.

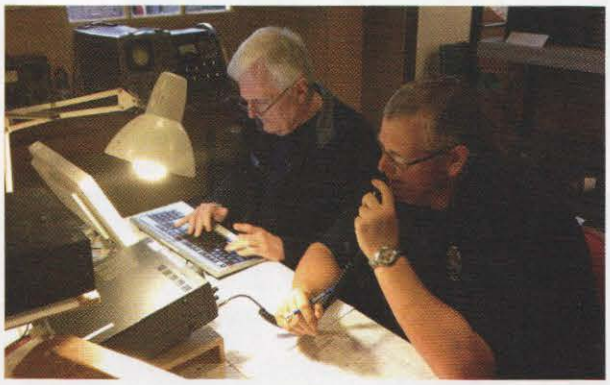
Rod Hickey, G6LVJ

SANDFORD MILL. To support the 27th International Marconi Day, the Chelmsford Amateur Radio Society was active with a station at Sandford Mill Museum on Saturday 26 April.

Club members joined amateur radio stations from around the world to celebrate IMD. The team was operating with the club callsign GX0MWT from inside the famous 2MT hut inside the historic Sandford Mill.



Pete, M0PSX logging for Louise, M3WSQ.



John ,G1UZD and James, 2E1GUA working 40m for IMD 2014.

A 40m voice station was active for much of the day, as well as a busy CW station and a Morse code ticker-tape demonstration for younger visitors to the museum.

The Chelmsford Amateur Radio Society team was also joined for the day by Louise Simpson, M3WSQ, who was able to make her first HF QSOs and work her first pile-up, with the help of CARS.

For the photo gallery and more details, go to www.essexham.co.uk/imd2014
Pete, M0PSX

BREAN DOWN. Weston Super Mare Radio Society celebrated International Marconi Day with a special event station, GB0IMD, located near the old fort at the end of Brean Down in Somerset. This was where Marconi carried out some of his early experiments in 1897 using a kite aerial and it was hoped to recreate this but very blustery conditions prevented this. However, 260 CW and over 100 SSB contacts were made using a more conventional antenna.
Tony Griggs, G4KMB

TYWYN. Telford and DARS spent International Marconi Day in Tywyn, Mid Wales. Formerly a receive only station for the Marconi Company to the send only station near Caernarfon, it worked for just 10 years from 1913-1923. Several members of the club helped with the preparation, set up running and eventual dismantling of the station after the 24 hour period. Across three stations 40m / 10-15-20m and one that worked 80m & 160m at night using a homebrewed trapped dipole, and 17m during the day with a homebrew delta loop. 1000 contacts gained in the 24 hour period, with at least one station working the whole time.

CAISTER. Amateurs at the Caister Lifeboat Visitor Centre in Norfolk managed to contact 311 other radio amateurs in 30 different countries when they took part in the annual International Marconi Day to mark the inventor's birthday. Using the call GB0CMS and a mixture of Morse code, telephony and PSK63, contacts were made with other amateurs across Europe, Canada and the USA. Notable contacts were with other special Marconi stations in the UK, Italy, the USA and Canada, including St John's Newfoundland, where Marconi's signals were first heard across the Atlantic from Poldhu in Cornwall in 1901.

Norfolk Amateur Radio Club ran the all-day special event station at Caister Lifeboat to commemorate the village's original Marconi Wireless Station, which was established at Caister in 1900. The station was in a house in the High Street known as Pretoria Villa and its original purpose was to communicate with ships in the North Sea and the Cross Sands lightship.

Visitors to the station including many other local radio amateurs and members of the National Coastwatch Institution (NCI) who operate from the lifeboat HQ. The equipment used was 100W from an Icom IC-756 Pro 3 (40m) and Yaesu FTDX-3000 (20m). Antennas were a W5GI dipole on 40m and a G0KYA-designed end-fed half-wave vertical for 20m.
Steve Nichols, G0KYA

AWARD. International Marconi Day runs for 24 hours and HF contacts count for the various awards that are available. The use of the internet to communicate between stations such as using the Internet Relay Linking Project (IRLP) or Echolink will not count towards these awards. All modes on the HF bands are accepted and you can see the seven awards available on the website at http://g4usb.net/IMD/the-award/award-classes/ The organisers suggest that those transmitting amateurs who are interested in the award scheme should log all two-way contacts heard between IMD award stations and other stations. Then, even if you fail to establish contact with the stations yourself, it will still be possible to claim the SWL award using a combination of heard and worked contacts.

The Certificates are based on an original Marconi Stock Certificate from around 1901. See http://g4usb.net/IMD/the-award/award-classes/

GB0IMD operated by Weston Super Mare RS.

Malcolm, G3PDH, operating the Caister radio station.

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TH-F7E £239.95
DUAL BAND WITH ALL-MODE SCANNER BUILT IN

TH-D72E £429.95
NEW FM DUAL BAND TRANSCEIVER

MC-60A £119.95
DELUXE DESK MICROPHONE

PS-60 £299.95
MATCHING PSU FOR TS-590/2000

The KG-UV6D "Pro-Pack"

Buy a new KG-UV6D with all the most popular accessories bundled together for a VERY special price.
RRP £159.95. Now Only £119.95
Offer ends 31st June 2014

- ✓ KG-UVD6D New Dual Band Handie
- ✓ Dual-Band Mobile Antenna
- ✓ Desk Top Charger (110-234v & 12V input) & Power Cord
- ✓ Cigar Car Charger
- ✓ Headset with PTT & Mic
- ✓ Eliminator
- ✓ Remote Mic/Speaker
- ✓ Leather Case
- ✓ 1300mA Li-Ion Battery
- ✓ 1700mA Heavy Duty Li-Ion Battery
- ✓ AA Empty Cell Case
- ✓ PC Programming Lead
- ✓ PC Drivers & Software

WOUXUN®

NOW IN STOCK

New Product! Wouxun KG-UV8D

The World's First Handie with a Large Format Blue Colour Display Screen.

- ✓ + 5W Output on 2/70
- ✓ + 1700mA battery as standard
- ✓ Duplex cross-band repeating
- ✓ Duplex working (one TX while the other one RX simultaneously)
- ✓ Twin receiving (RX simultaneously on same band)
- ✓ Large colour display screen
- ✓ DTMF encode and decode

Introductory price of only £99.99 inc VAT.

KG-UV6DL 4m + 2m Handie
To replace the KG-UVD1PL, this new version offers the same features as its 2/70 brother but on the very popular 70MHz & 144MHz bands.
ML&S Price: £119.95

KG-679E/2M
2m FM Handie Also available for 70cm!
KG 679E/2M..... **NOW ONLY £49.99**
KG-679E/U 70cm (400-470Mhz)..... **£64.99**
or with Voice Scrambler KG-689E/U. **£69.99**

KG-UV6D 2/70 FM Transceiver
The KG-UVD1P was the UKs best selling Dual band Handie.Meet the New Enhanced Featured, Superior Build KG-UV6D.
ML&S Price Only £89.99 and that still includes a Base Charger, Li-ion Battery, Antenna & Belt Clip.

Perseus VLF-LF-HF Receiver

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

Save £100 this month. Only £599.95

Perseus-FM+

High Performance FM 88-108MHz adapter for the Perseus SDR Receiver. Available now.
£299.95

FUNcube Dongle Pro+ £149.95

As featured on TX Factor Episode 2

- Coverage is from 150kHz (yes, that's kHz) to 1.9GHz.There is a gap between about 250MHz to 410MHz. There isn't a gap anywhere else.
- Eleven discrete front end filters, including some really, really serious SAW filters for 2m and 70cm
- 0.5ppm TCXO
- Much improved phase noise
- Better Dynamic Range by up to 7dB
- Tuner PLL Steps from memory
- All this plus more and still no drivers required!

NEW IN STOCK

X1M Platinum 5 Band QRP SSB/CW 80-10m Transceiver

This brilliant little transceiver covers 80m-10m, has built-in CAT interface, CW Keyer, 2 VFO's, 5 Watts output & can even work split mode.
Only £279.95 Available from stock.

Looking for a hands free mic for you car that actually works?

The MS-5.
A safety microphone for mobile or base use that really is "plug & play".
Available for most Icom, Kenwood & Yaesu Radios.

Only £39.95

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New! Yaesu FTM-400

Large Colour Touch Screen Display.

The all new FTM-400 offers 4 modes of transmission including Voice & Data at the same time, Voice FR Mode, Data FR mode & Analogue FM. Massive 3.5" colour display, Dual receive and more.

ONLY £539.95

See www.hamradio.co.uk/ftm400 for more info.

FT-897D

The UK Military really do use this radio, 160m-70cm, compact & rugged.

CALL FOR BEST PRICE

New! Yaesu FT-1D

Very first Dual Band Full Digital Handie using C4FM & FDMA Digital technology. **£379.95**

FT-450D

The baby of the range but not in performance or functionality. Full feature HF-6M base transceiver with large easy to read display.
Only £691.95

Yaesu FT-857D & ATAS-120A

160m-70cm HF Base/Mobile.
Still our best selling HF Mobile Radio.
FT-857D + ATAS-120A: £979.95
FT-857D HF-70cm Mobile Only: £689.99

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

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

Yaesu FT-8900E
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!
ML&S Price £329.95
With FREE YSK-8900 Remote Kit

NEW Yaesu FT-252 2M Handie
A compact, simple to operate 2M Handheld Transceiver that provides up to 5 Watts of RF power, along with loud audio output (800 mW)
ONLY £69.95

Yaesu VX-3E
Micro Handie 2/70 with scanner
£129.99

Yaesu FT-60R
Twin band handie **£119.95**

Yaesu VX-6E
2/70 handie **£179.99**

Yaesu VX-8DE Triple Band 6/2/70 with enhanced APRS.
£379.95

Yaesu FT-817ND
All Band All Mode Portable Transceiver
ML&S price only £524.95

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

Yaesu VR-160
Miniature communications receiver
£199.95

QUADRA (VL-1000)
1kW HF/6m Solid State Fully Automatic 1kW HF/6m Linear Amplifier with matching power supply and internal Auto-ATU. **Last one available, call for a superb deal.**

MD-100a8x
Base Station Microphone
£139.95

MD-200a8x
Elite Deluxe base Station Microphone
£229.95

Looking for the very best deal on any Yaesu product?

Then call the company that sells more Yaesu than any other dealer in the UK.
Got a trade-in? Martin founded the business on trade-in's almost 25 years ago! We want to get that new Yaesu rig into your shack as much as you do.
Give our sales team a call today on 0345 2300 599.

Choice of the World's Top DX'ers

Only £3985.00 after CASHBACK from Yaesu

FTdx5000MP
200 Watt Base transceiver with Pan-adapter display & balanced speaker system, internal PSU & ATU. MP Spec includes OXCO Hi-Stab Oscillator & additional roofing filter.

Only £1998.80 after CASHBACK from Yaesu

FTdx3000
Big brother of the FTdx1200 boasting additional readout, down-conversion architecture receiver like its bigger brother FTdx5000.

CASHBACK Offer Ends This Month!

Only £1299.95 after CASHBACK from Yaesu

FTdx1200 *See ML&S video review hamradio.co.uk/ftdx1200video*
The Yaesu FTdx1200 provides sophisticated operation on 160 to 6 meters with up to 100 Watts on SSB, CW, and FM (25 Watts AM carrier).

Yaesu Flagship Champion

FTdx9000 Series
Built to order, with a **massive £418 off** ML&S discounted price. **Call for details.**

Get up to £418 CASHBACK when you buy a new HF Rig. See hamradio.co.uk/YaesuCashback
This offer ends June 30th 2014.

Yaesu Rotators

Largest stocks in the UK and, of course, the best prices. Cable extra.

G-450	£339.95
G-550	£329.95
G-5500	£629.95
G-650C	£379.95
G-1000DXC	£499.95
G-2800DXC	£949.95
GS-065 Mast bearing	£57.14
GC-038 Lower clamps	£34.95
Rotator cable 25m	£69.95
Rotator cable 40m	£123.95
Rotator connector plugs	£25.95

YAESU
UK's Largest Dealer Distributor

CG SB-2000 Mk11 Radio Interface

New from CG, the SB-2000Mk11 is an updated version of the original. The unit now supports 2 serial ports allowing you to have one reserved for CAT/CI-V rig control, the other for data operation. It also supports faster speed rate for CAT & CI-V, up to 19200bps.

Only £89.99

Connect your computer with USB port.
- USB to UART bridge by FT232 single chip. USB 2.0 compliant. Full speed.
- CAT, CI/V controller and audio transformer are combined together.
- Complete isolation between computer and radio station.
- Optical isolation used for digital signal.
- Audio signal isolated 1:1 transformer. It has internal static isolation.
- Powered via your USB port.
- Excellent EMC(Electromagnetic compatibility)
- Dimensions 135 x 76 x 48mm.
- Weight less than 400 grams.

Complete set of interface cables for your radio £19.95.
For more info see: www.hamradio.co.uk/cg2000

Elad FDM-S2

£449.95

The New FDM-S2 is the latest in a line of ELAD SDR Sampler receivers.

Direct sampling receiver based on 122.88MHz 16bit single channel ADC converter covering HF 6m and offering the possibility to exploiting the under-sampling mode.

The Flex Store at ML&S

FACTORY APPOINTED DEALER FlexRadio Systems® Software Defined Radios

With the FLEX-6000 Signature Series radios, FlexRadio brings a wealth of new capabilities to the amateur including direct digital reception, transmission and networking.

Flex-6300 1.8-60MHz, 2 Slice RX 100W SDR TCVR..... **£1699.95**
Flex-6500 1.8-60MHz, 4 Slice RX SDR 100W Transceiver..... **£3349.95**
Flex-6700 1.8-60MHz, (+RX 135-165MHz) 8 Slice RX SDR 100W Transceiver ..... RRP £5799.95 **Only £4999.95**
Flex-6700R as above, Receiver only **£4799.95**
Flex 1500 SDR Low cost SDR Transceiver, connect via USB & you have 5W 160-6m..... **£599.95**
Flex 3000 with ATU 100 Watt SDR 160-6m with Auto ATU fitted ..... RRP £1399.95 **Only £1199.95**

New! Flex 6300
1.8-60MHz, 2 Slice RX 100W SDR TCVR.
RRP £1999.95 **ML&S Intro Price £1699.95**
On Demo & in stock demo now!

Flex-6700 Signature now on demonstration in store!

We always have the entire FlexRadio range on demonstration via three 42" screens. Call in for a demo today.

Tigertronics SL-USB **From only £99.95**

Tigertronics

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

Call to discuss your rig-to-cable requirements.

Nifty KX3 Stand

Made of heavy duty black acrylic with a beautful high gloss finish especially designed to fit the Elecraft KX3.
Only £29.95

MyDEL

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

MyDEL MP-30SW1V

It's Back!

You kept asking for it so we asked the factory to build us another run.

25Amps, 9-15V DC, super light with digital metering for Volts & Amps. **£89.95**

Two-year warranty on all MyDEL PSUs

MyDEL MP-304Mk11

New addition to the MyDEL range of PSU's. Heavy Duty LINEAR 30Amp

For those of you that prefer old style non-switching technology in your power supply we think this new 30 Amper from MyDEL is the one. Switchable Volts/Amps with large precise metering (analogue of course!) variable Voltage, Cigar socket output for all your accessories, twin front panel outlets for up to 6Amps and two large binding post terminals for up to 30Amps. Remember, all MyDEL PSU's come with a two year no quibble guarantee.

£99.95

NEW MP-7L

Small & compact, this new Linear 6-7Amp PSU is ideal for running ancillary items in the shack.

ML&S Price: £29.95

MyDEL MP-50SW111

50Amp DC power supply. **£125.00**

Probably one of the lightest 50Amp DC power supplies available today, the new MP-50SW111 weighs in at only 2.2Kilos (4.85lbs). Unbelievably compact measuring a mere 195mm wide including chunky rear terminals and front panel knobs and only 85mm wide.

Yaesu FP-1030A

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

£179.94

New product!

CG-FS02

Heavy Duty Foot Switch.

Your house will probably fall down before you break this new remote Foot Switch from CG. All metal construction with 1m heavy duty screened cable and terminated with 1/4" jack plug.

Only £29.95

New product!

MyDEL SW-2PL

Made from solid die-cast alloy, 2kW DC-30MHz, 250W .5-1GHz and SO-239 sockets.

Only £29.95

MyDEL

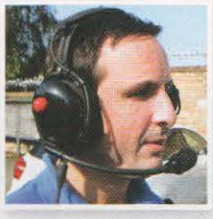
Have you seen TX Factor yet?

Episode 3 out now!

In Episode 3, the TX Factor team join Roger Stafford G4ROJ (the amateur radio 'King of Kites') to fly some amazing antennas for the lower HF bands and viewers are taken on a guided tour of the Military Wireless Museum, with curator Ben Nock G4BXD. Mike Marsh visits the Exeter Rally to report on how important smaller local rallies are to the amateur community and we take you to the cutting edge of SDR with a close look at the latest products from Flex Radio.

TX Factor is a TV Show dedicated to Ham Radio. TX factor See Hamradio.co.uk/txfactor

RADIOSPORT HEADSETS



Manufactured by Arlan Communications in the USA, they were first shown to Hams at the recent RSGB Convention in October. The response was so good we doubled our order to the factory.

Designed around their professional series of race headsets, the new Radio Sport range is aptly named. Ever tripped over a lead of your existing headset only to find you can't simply unplug it and pop in another? A mandatory requirement in contest conditions and just one example of how Arlan have taken a different approach to existing products design. Using a miniXLR 5P interface plug & socket you can be up and operating again in a matter of seconds.

Want to remove external noise without resorting to RF prone DSP reduction circuitry in your headset? Arlan Radio Sport headsets use a real Carbon Fibre outer shell to reduce external clatter by as much as 24dB. Even the ear cushions are interchangeable between Gel or Foam filled muffs in a matter of seconds. The microphone just unscrews for interchange to a different insert. Not a soldering iron in sight.

Whether for DXing, contesting, field day, or casual everyday use we think you'll agree Radiosport headsets have the features you want. Little wonder Arlan have supplied over 2 million headsets since their introduction in 1992. ML&S are proud to have been appointed their distributor and have stock today.

All headsets are supplied with GEL Cushions giving extra comfort and FREE cloth covers.

RS60CF Deluxe Dream Edition Stereo Headset with boom (as featured)	£179.95
RS20S Deluxe Dream Edition Stereo Headset only no boom	£119.95
Mini-XLR lead set for any radio (Yaesu/Kenwood/Icom/Flex/Elecraft)	£59.95
PTT-FS-RCA Foot switch with 7ft cable with phono plug	£44.95
PPT-HS-RCA Hand PTT Switch, 7 foot cable with phono plug	£44.95

How about an additional 3.5mm socket on the opposite ear cup to allow "tethering" of another headset for a logger or maybe just an additional pair of ears?

Kent Morse Keys

Kent Morse Practice Oscillator.	£31.95	Kent Single Paddle Key.	£95.95
Kent Twin Paddle Key.	£114.95	Kent Single Paddle Key Kit.	£94.95
Kent Twin Paddle Key Kit.	£98.95	Kent KT-1 Professional	£109.95
Kent Hand Key.	£99.95	Kent Vail Lever Correspondent Replica	£219.95
Kent Hand Key Kit.	£86.95		

ALPHA DELTA COMMUNICATIONS, INC.

Alpha Delta Antennas

Alpha Delta are a USA Manufacturer of high quality coax switches, lightning (surge) protectors and the best wire antennas money can buy.

Delta-2B	2-way position SO-239 switch (1kW) for use up to 1.3GHz	£59.95	
Delta-4B	4-way position SO-239 switch (2kW) for use up to 500MHz	£79.95	
Delta-4BN	4-way position N-type switch (1.5kW) for use up to 1.2GHz	£89.95	
AD-ATT3G50	0MHz to 3GHz (200W) surge protector. N-Female Connector	54.95	
AD-ATT3G50/HP	0MHz to 3GHz (2kW) surge protector. N-Female Connector	£56.95	
AD-ATT3G50U	0MHz to 500MHz (200W) surge protector. SO-239 Connector	£49.95	
AD-ATT3G50U/HP	0MHz to 500MHz (2kW) surge protector. SO-239 Connector	£49.95	
End Insulators	Dog Bones. They are extremely rugged, UV and RF resistant	£1.95	
Delta-DX-A	160m, 80m and 40m 1/4 twin slope trap antenna. This antenna combines the tremendous DX firepower of the 1/4-wave slope with the wide bandwidth of the 1/2-wave dipole. One leg is 67ft long and the other is 55ft long	£89.95	
Delta-DX-B	160m, 80m, 40m and 30m single slope trapped antenna. This antenna is designed for limited space installations, were room does not allow for large wire antennas; it only requires 60ft of space providing amazing DX performance at installation heights of 35ft	£89.95	
Delta-DX-CC	80m, 40m, 20m, 15m and 10m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£139.95	
Delta-DX-DD	80m and 40m dipole. This antenna is parallel length dipole with no traps; overall length is 82ft	£119.95	
Delta-DX-EE	40m, 20m, 15m, 10m dipole, it can be used on 30m, 17m, 12m with an ATU. This antenna is not trapped, and has an overall length of 40ft	£129.95	
Delta-DX-LB	160m - 80m, and 40m Low Band dipole. This antenna performance and 2:1 VSWR bandwidth depends on the height and surrounding objects; overall length is 100ft	£119.96	
DX-LB-PLUS	160m, 80m, 40m and 20m - 10m Low Band dipole. This antenna performance and 2:1 VSWR bandwidth depends on the height and surrounding objects; overall length is 100ft	£169.95	
DX-Series	Full-size utilized monoband dipole. These dipoles are using the Delta-C Centre Insulator with built-in Arc-Purge Surge Suppressor. **DX-20:** 20m Monoband Dipole at 33ft long **DX-40:** 40m Monoband Dipole at 66ft long **DX-80:** 80m Monoband Dipole at 133ft long	£49.95	
DX-Ultra	Medium wave to 30MHz 80ft AM Broadcast Dipole. Efficient, low-noise dipole for military, government, etc., use	£149.95	
AD-Delta C	Hardware Kit contains the following: 1 x Dipole Centre. 2 x Dog Bones. 1 x Surge Protection Block	£29.95	
Delta-SEP	Replacement/spare Arc-Plug™ Static Electricity Protector. This unit is usually attached to the back of the Alpha Delta Centre T Balun	£14.95	

Alpin HF Linear Amplifiers

Very special prices for two very special amplifiers

BOTH IN STOCK

Offering extraordinary value for money, Alpin offer superbly engineered HF & 6m Linear amplifiers with excellent reliability. To date we haven't had one back for repair!

Alpin 100Mk11
HF+6m Linear Amplifier
1kW+ PEP output.
RRP £2299.95
ML&S Price Only £2279.95

Alpin 200
HF Linear Amplifier 2kW PEP Output from 2 x 4CX800A's.
RRP £3499.95
ML&S Price Only £3195.95

Ameritron Amplifiers

Only available from ML&S, each and every AL-811HXCE is modified and checked in our workshops to improve reliability & performance. A very cost effective way of getting up to 800W PEP from a neat compact mains powered HF Linear Amplifier.

Ameritron AL-811HXCE+ ML&S Price: £1099.95

See web for full range and specifications.

MyDEL

New! CG-3000R

The best value remote wire antenna tuner now with remote control included.

Only £289.95

WonderWand WonderLoop Antenna

Wonder Wand Antennas U.K.

The UK's favourite rig-mounted antenna system!

NEW! WonderWand Widebander
1.8-460MHz with 1.3M Whip!.....£129.95

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

ML&S PRICE ONLY £91.95 *For full info & video see: www.hamradio.co.uk/wonderloop*

If you are an avid FT-817 or KX-3 operator and enjoy nothing more than heading for the hills on a weekend to active those rare WAB squares. Take a look at the all new WonderWand WonderLoop Antenna.

Incorporating their easy to use tuning circuit, which offers frequency coverage from 20m-6m and handling 10w of RF power, you can be on the air in seconds. The tuning unit is enclosed within a lightweight ABS case, no larger than a pack of cards. This means you will no longer need to carry around all those additional extras needed to string up a wire in the field. There is also no need to worry about running a counterpoise with this efficient loop design.

So how does it perform? As we had sunshine this afternoon, we popped out into the car park here at ML&S and attached the loop to our demo FT-817. Within minutes we had tuned to the 20m band worked into EA, I and 9A. Not bad for 5w and the 'shack' in our hand.




NEW IN STOCK

New Product! HighEndFed Antennas

A professional range of End Fed Wire antennas from the Netherlands. Each antenna is hand made, individually tested for resonance and SWR. All you have to do is take it out of the box and string the antenna up in the air, add a coax feed back to you radio.

HEF/3Band	40/20/10m 200W, 11.85m Long	£134.95
HEF/5Band	80/40/20/15/10m 200W, 23m Long	£149.95
HEF/40m-QRO	40m Mono Bander, 2kW Only 20m Long	£219.95
HEF/20m-QRO	20m Mono Bander, 2kW, Only 10m Long	£199.95

For the full range see www.hamradio.co.uk/hyendfed

MyDEL-SARK110 Vector Impedance Antenna Analyser

£329.94

The SARK-110 Antenna Analyser is a pocket size instrument providing fast and accurate measurement of the vector impedance, VSWR, vector reflection coefficient, return loss, and R-L-C (as series or parallel equivalent circuits). Typical applications include checking and tuning antennas, impedance matching, component test, cable fault location, measuring coaxial cable losses, and cutting coaxial cables to precise electrical lengths. The SARK-110 has full vector measurement capability and accurately resolves the resistive, capacitive and inductive components of a load. The measurement reference plane is automatic adjusted via the Open/Short/Load calibration standard to enable the accurate impedance measurements at the end of an intermediate coaxial cable.

mRS MiniVNA Series of Antenna Analysers

Perfect for checking antennas and RF circuits for hams and commercial users.

MiniVNA Pro with Bluetooth
100kHz-200MHz
£379.94

MiniVNA Extender
For Pro only, extends range to 1500MHz
£299.94

Super Antenna MP1 SuperStick

Covering a massive 80m right through to 450MHz*, this simple to erect compact vertical antenna weighs only 1kG, is only 2.1m tall when fully extended and collapses down to just 30.5cm (12")!

*With optional 80 & 60m coils

Only £159.95 including the 80m Coil FREE!

Product features:

- Ham bands: 40m-30m-20m-17m-15m-12m-10m-6m-4m-2m-70cm
- Frequency Range: HF 7MHz~30MHz continuous
- Frequency Range: VHF 48 to 144MHz continuous
- SWR: 1.5 : 1 or better
- Rated Power: 500W SSB; 300W CW / DIGITAL
- Antenna Weight: < 2 pounds (1kg)
- Also configurable for up to 450MHz
- Standard 3/8"-24 male thread for mounting
- Low profile TM1 tripod included
- MC80 80m coil included for 80m band
- Optional MR series radial sets available
- Optional MC60 60m coil for 60m band

For the complete range of Super Antenna products see www.HamRadio.co.uk/Superantenna

DIAMOND

Huge selection of Diamond products always available

Base Antennas

NEW! CP-VU8 80m-70cm 200W Compact HF Base, only 2.7m Long!.....**£469.95**
X-30 2/70, 3/5.5dB, 1.3m Long .. RRP £79.95 **SPECIAL £59.95**
X-50N 2/70, 4.5/7.2dB, 1.7m Long RRP £72.95 **SPECIAL £64.95**
X-300N 2/70, 6.5/9dB, 3.1m Long RRP £146.95 **SPECIAL £109.95**
VX-1000 6/2/70 2.15/6.2/8.4DB 1.42M Long ..... RRP £149.95 **SPECIAL £99.95**
X-510N 2/70 Fibre glass 8.3/11.7dB gain. 5.2m long "N" ..... RRP £154.95 **SPECIAL £129.95**
V-2000 6/2/70, 2.15/6.2/8.4dB, 2.5m Long ..... RRP £149.95 **SPECIAL £109.95**

Mobile Antennas

NR-770R 100W, 2/70, 3/5.5dB, .98m Long..... RRP £34.95
NR-770RSP as NR-770 but spring loaded..... RRP £39.95
NR-7900 2/70, 3.2/6.4dB, 1.46m Long ..... RRP £54.95

Duplexers/Triplexers

MX-72N 1.6-150/400-460MHz Duplexer ..... RRP £44.95
MX-62M1.6-56/140-470MHz Duplexer ..... RRP £69.95
MX-610 HF/6+2+70 (for FT-8900)..... RRP £59.95
MX-2000 6/2/70 Triplexer ..... RRP £91.95
MX-3000N 2/70/23 Triplexer..... RRP £86.95

Switches

CX-210A 2-way, SO-239 Die Cast..... RRP £53.95
CX-210N 2-way, N-Type, Die Cast ..... RRP £82.95
CX-310A 3-way, SO-239, Die Cast..... RRP £89.95
CX-310N 3-way, N-Type, Die Cast ..... RRP £114.95

HUSTLER

Hustler are one of America's oldest manufacturers of Ham Radio antennas. The famous "White Whips" have been seen on many cars operating HF mobile. Their HF base range of 4, 5 or 6-BTV antennas are probably the easiest to assemble and get going and of course are ground mounted, operating with just an earth spike mounted close to the base.

See web for full listing!

Base Station Range
Free standing, max 7.3m tall, 1kW

4-BTV	40/20/15/10m	£189.95
5-BTV	80/40/20/15/10m	£229.95
6-BTV	80/40/30/20/15/10m	£269.95

The full mobile and base range and accessories available from stock, including the high power 1kW mobile range.

BlueCAT Repeater Controller

Only £59.99

Using your Android phone you can instantly touch a repeater and see your rig jump to the frequency, CTCSS & offset. Designed & built in the UK by ZB2M, exclusive to ML&S and appointed dealers.

Now available for Yaesu & Icom Transceivers, see www.hamradio.co.uk/BlueCAT

MFJ Products

Lots more MFJ stocked! See web for details

MFJ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Alderford Mill, activated by Braintree & District ARS.

Mills on the Air

Some experiences of this year's event

BRAINTREE & DARS. This year Braintree & DARS used Alderford Water Mill in the village of Sible Hedingham, Essex as their base for the Mills on the Air operations. The mill was rebuilt about 200 years ago and is on the bank of the River Colne in that village. They set up on Friday, the 9th, with a trap dipole for HF and a 2/70 collinear atop the mast that supported the centre of the dipole.

The club operated both Saturday and Sunday, with many other mills being worked on HF both in the UK and the near continent. Unfortunately, the location, in the bottom of the river valley, did not lend itself to VHF / UHF contacts, so they concentrated on HF. The operators managed to work 33 different mills and, because Alderford Mill is open to the public, they received a lot of interest from visitors. It was a great weekend and they are looking forward to next year.

Tony King, G0IAG

Edwin, G0LPO operating and Melvin logging at Alderford Mill.

WATERSIDE NEW FOREST RC. Last year, the Waterside New Forest RC was unable to celebrate National Mills on the Air Weekend at Eling Tide Mill owing to renovation of structures at the neighbouring sailing club. However, this year, the club was able to set up the radio station GB0ETM in the attic of the mill and a G5RV aerial outside, with the kind cooperation of the sailing club. Their QSL card shows a watercolour of the mill by local artist Gervaise Gregory.

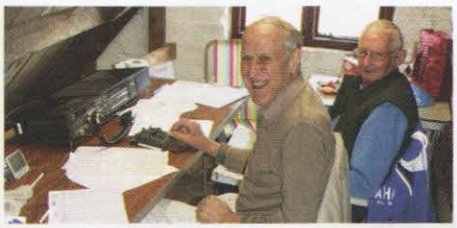
The earliest surviving reference to Eling Tide Mill appears in the Domesday Book, in 1086 AD and, over the centuries, it has had to be rebuilt many times, on the last occasion in the 1770s, after extensive storm and flood damage. In 1975, the mill was bought by New Forest District Council and work on the latest restoration was started. Eling Tide Mill Trust was set up to complete the restoration and to administer the mill as a working mill and museum. In more recent times, Totton and Eling Town Council took over responsibility for running the mill. Today, the club believe the mill is the only fully working and productive tide mill in the UK, harnessing the power of the tide to grind wheat into flour.

GB0ETM was set up in the mill and run by Tim, G4YVY and Robin, G0OSG, with transportation assistance from Tony, G6MNL and, during the weekend, club members visited the mill and helped to operate the station, including new members Rhod, M6RFG and Bob, M6CYF. When conditions for voice communication on 40m deteriorated radically on Sunday afternoon, Peter, G0RGB stepped in and communicated successfully using Morse. The club's G5RV aerial, stretched between the local yacht club's mast and a club mast, was fed by the radio club's FT-757 GX MkII transceiver. On the 40m band, in spite of a high noise level, many successful contacts were made with UK and European amateur radio stations, including from the Netherlands, France and Belgium. As the time to close the station down approached, Gordon, G1ZEC arrived to help with the dismantling.

Everyone involved agreed that holding the event in this unusual setting had been well worthwhile and great fun.

Rod Hickey, G6LVJ

M6CYF, G4YVY and G0OSG at Eling Tide Mill.



G0RGB & G4YVY at Eling Tide Mill.

NORTHERN IRELAND. Bangor and District ARS members were in attendance at Ballycopeland Windmill, Millisle, for Mills on the Air. They logged 109 contacts on HF and 51 on VHF / UHF. The photograph shows Sam, GI4MBM, David, MI6DTE and Bertie, GI4POC at the windmill after a session slaving over the microphone. For more info, see the website www.bdars.com.

Norman Newell, GI3YMY

Sam, GI4MBM, David, MI6DTE and Bertie, GI4POC at Ballycopeland Windmill.

SOUTH ESSEX ARS. South Essex Amateur Radio Society operated from Rayleigh windmill in Essex each year in the Mills on the Air event coordinated by Denby Dale Radio Society.

Although this year the weather was a bit challenging, they operated on 2m and HF and made 59 contacts in 13 countries including several other windmills. Operators had the added bonus of Vic's bacon rolls during the day and the event ended as one of their best.

Terry Howchen

Design Notes

Driving 'Wrong Voltage' Relays

SURPLUS RELAYS. Many of the nice RF coaxial and high power relays we get our hands on don't seem to run off the voltages we want them to. Many require 24 to 28V supplies and there are relay coils around that need a 15V supply to switch. So if we want to run from the standard nominal 12V car battery supply voltage, we have a problem.

The cleanest, or nicest, solution is to use a step up inverter to generate a suitably rated 28V supply and use that for the relay coil switching. The 'Simple Switcher' switch mode power supply chips [1] are a series of building block devices, mostly in 5 or 7 leaded TO220 cases that, with a minimum of extra components, allow a simple DC/DC converter to be built. Step up and step down versions are available and they come with a range of current ratings and power capabilities. They are produced in both fixed voltage and adjustable versions. **Figure 1** shows how one device designed for step up voltage conversion, the LM2577, is connected to give a 26V supply from a 10 to 15V input. The output voltage can be altered by changing the value of the 20k resistor. This device has a switch rated at 3A. In a step up design this means the maximum input current that can be switched. So we can get an idea of the power throughput capability by assuming this current to be switched at the minimum input voltage, which for a car battery supply we'll call 10V. Therefore the maximum input power in this situation is now 10V x 3A = 30W so, allowing (say) 90% conversion efficiency, this means that an output current of nearly 1A at 26V can be achieved, worst case. This should be more than enough for even the heaviest-duty high power coaxial relay. The data sheet for the LM2577 can be obtained from a variety of sources – your favourite catalogue supplier is nearly always the best source of data sheets. Farnell and RS both have a huge range of data and probably more visits are made to their sites for information than is ever made for purchasing.

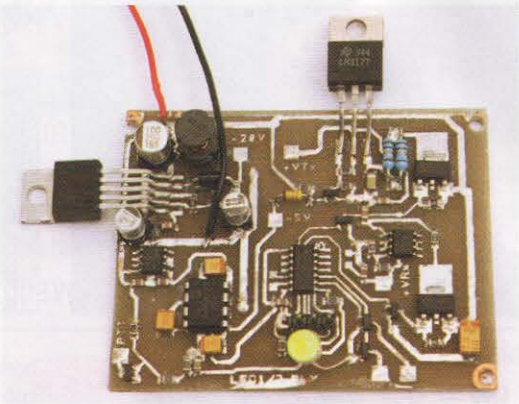


PHOTO 1: A transverter DC control unit with a LM2577 Simple Switcher at the top left that provides a 26V supply. The busy PCB also has a PIC sequencer, relay driver FETs, voltage regulators with switched supplies for Tx/Rx and a low current negative supply for GaAs FET biassing.

Calculate the inductor value according to instructions in the data sheet using your own values for output minimum current and maximum voltage. This usually defines a minimum value for the inductor based on minimum current drain. The catalogues are full of suitable SMPSU chokes, but for the 28V relay inverter design here, a value of 100µH to 500µH will be adequate; it is not terribly critical and surplus SMPSU inductors can invariably be salvaged from the old PCBs found at rallies. The output diode needs to be a fast switching type. Schottky diodes are usually used in SMPSUs for maximum efficiency. They have a low forward voltage, typically 0.15 to 0.3V, but don't have very high reverse voltage rating: 50 or 60V maximum is typical, so in a 28V supply if the voltage could get wound up higher, things can get a bit marginal. However, they're cheap enough and if you blow one nothing else is likely to get damaged. That is the nice thing about step up SMPSUs: there are no major failure mechanisms that can ever cause over voltage on the output when components are overloaded or stressed.

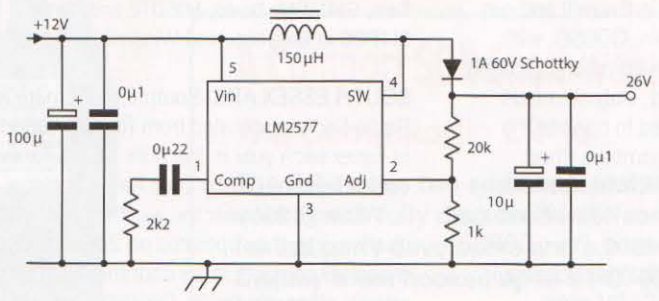


FIGURE 1: Using the LM2577 Simple Switcher IC as a 12V to 26V DC-DC converter for powering higher voltage relays.

Remaining components worthy of note are the input decoupling capacitors. These have to supply a high ripple current and several smaller value aluminium electrolytics in parallel do a better job than one large one. DO NOT be tempted to use tantalum devices here. While having a lower internal resistance, they cannot handle the large ripple current and can fail spectacularly at high power throughput. Yes, I have done it and the spurt of flame from an overloaded tantalum chip capacitor is quite impressive.

Photo 1 shows a simple switcher used as the relay supply on a transverter control board.

THE SIMPLE WAY. There is a simpler way of driving the majority of relays, one that does not require a DC/DC converter. Most coils need close to the full rated voltage to pull in, usually because the armature has to be pulled in from its furthest position away from the iron core. Once it has been attracted to the electromagnet's core, a reduced holding current is all that is necessary. In practice, many relays will quite reliably hold on at voltages well below 12V, even if something like 24V is needed to pull them across in the first place. This also has the incidental advantage of offering a considerable power saving, with less heat being pointlessly wasted warming up the coil when the relay is energised.

If we can supply an initial high voltage pulse to get the armature moving then drop this to a suitable holding value, we could have a quite reliable efficient relay driver circuit. The idea is to charge a large capacitor to 12V during the off period, usually during the receive session, then connect this in series with the supply when the relay is energised on transmit. The fully charged capacitor added to the supply voltage delivers a brief pulse of 24V, which drops to the 12V holding value once the capacitor has discharged; the 12V is maintained by steering diodes. The capacitor has to have sufficient charge storage to keep the pull in voltage high enough for the few tens of milliseconds it takes to get the armature moving. A 28V relay may have a typical coil resistance of 400Ω so a 470µF capacitor results in a time constant of 190ms, which is appreciably more than the pull in time of most microwave coax relays. High power large VHF relays may require more substantial pull in 'oomph'.

A basic circuit for driving such relays from 12V can be found on KO4BB's website [2]. A more detailed description of its operation, with some graphs of voltages appearing

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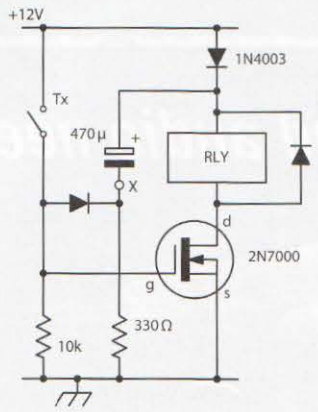


FIGURE 2: Basic circuit for driving 24V relays from a 12V supply. Other topologies exist, but all work in a similar manner. Unmarked diodes can be 1N4148 or similar.

across the coil during operation is included. Ian White, G(M)3SEK also covered this technique used for relay speed up in 'In Practice' several years ago. Ian's version used an alternative circuit topology, although it worked in the same way [3].

I have a relay coil used in a novel 24GHz waveguide switch that is actually a long throw solenoid. The coil resistance is 95Ω and testing showed it needed at least 12V for 100% fully reliable operation. It will just about work at 11V but fails most of the time at 10V so is not suitable for direct drive using car battery supplies. Once pulled in, it will hold on at a voltage as low as 6V so the capacitor boost solution looks ideal. As the solenoid armature has a long throw and there is also some mechanical friction involved in the RF changeover, the pull in time is a fair bit longer than most relays. At 11V it appears to take over 200ms to pull in properly. I put together the circuit shown in **Figure 2** to see how effective it was. The capacitor value of 1000µF was chosen arbitrarily, giving a time constant of 100ms with that relay coil. That ought to be sufficient, with the worst case 10V supply giving a relay initial 'kick' of around 19V.

The breadboard worked fine, pulling in the relay reliably with a DC supply voltage down to a little under 9V, so it was going to be perfect for >10V operation. BUT there was a big snag. If I toggled the Tx/Rx control line fast, at a Tx/Rx changeover rate of less than a second or two, the relay often wouldn't pull in. If it was rested with the relay deactivated (Rx mode) for several seconds, it would always pull in properly. The snag comes about because during the rest period the 1000µF capacitor has to recharge fully, which it has to do through the 330Ω resistor. To charge properly needs at least three time-constants, so 330Ω * 100µF * 3 = 1 second. Not good enough! A quick solution would be to just use a lower value resistor, but the snag with doing that is that during the relay activated, or Tx phase, it has the full supply voltage across it. 12V across 330Ω is already dissipating over 400mW and a smaller value resistor here would just get hotter still – it's just plainly a silly way to do it.

ADDING BELLS AND WHISTLES. I intend using a PIC microcontroller based sequencer in the finished transverter project – this is essential to protect the expensive 24GHz power amp from damage during the Tx / Rx switching cycle. DC power to the PA is applied after the relay has moved over to its Tx position, then DC is removed before it is changed back to Rx. This ensures the PA is energised only when the relay output passes to the antenna port and never during changeover operation when it may be short or open; or, even worse, leaking high power RF into the receive converter.

With all that processing capability in the sequencer there has to be a way of overcoming the fast Tx/Rx changeover from upsetting the relay's pull in, without the higher dissipation. In fact there are two ways of doing it.

One involves measuring the voltage on the boost capacitor and ensuring the relay drive is only allowed to be activated if the capacitor is sufficiently recharged. This may result in additional delay in going to transmit after pressing the PTT, but who cares, if it protects things? Most PIC families include devices with an analogue to digital converter internally, so by adding one additional resistor to pot-down the voltage across the capacitor, marked as point X in Figure 2, to the range 0 – 5V for the A/D converter, the voltage can be measured in real time. (The two resistors forming the potential divider can work together in series as the charging resistor). As the capacitor charges, the voltage at point X falls to zero over a period of a few hundreds of milliseconds. The PIC measures this voltage and will only allow a subsequent Tx changeover when it is low enough to ensure the relay will be properly pulled in.

If fast cycling between Tx and Rx really is necessary then just sitting and waiting for a full charge on the capacitor becomes unacceptable. The second solution involves forcing a fast charge by switching an additional resistor in parallel with the fixed one for a short period. A low value resistor in series with a switching FET as shown in **Figure 3**, is controlled by another pin on the microcontroller. After going over to receive mode, this is switched on to rapidly charge the capacitor. Then, just before Tx mode is subsequently activated, the FET switch is released to avoid excessive power dissipation. The A/D converter can still be used to monitor the capacitor voltage and double check the pre-charge has worked properly. Figure 3 shows the full version, with a BSP452 high-side switch used to deliver Tx power to the circuit.

Since most microcontrollers with A/D converters offer several A/D inputs, another channel can usefully monitor the supply voltage. As this relay takes appreciably longer to pull in at low voltages, there may well be some advantage in adjusting the sequencer delays, making them longer as the supply voltage reduces. The two LEDs can indicate various fault conditions, like low supply volts, or excessive reverse RF power (measured via an output coupler plus detector diode and yet another A/D channel). But all that is in the future – at the time of writing I've just breadboarded the relay switch circuitry of Figure 2.

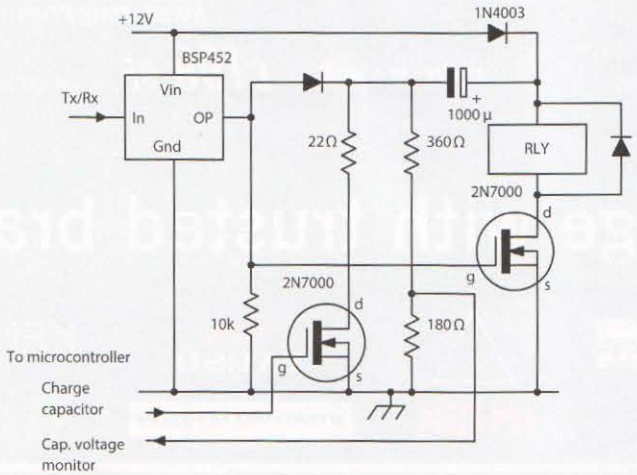


FIGURE 3: Modified version of Figure 2 with forced pre-charging of the boost capacitor to permit faster Tx/Rx cycling. This also monitors the capacitor and supply voltage levels using the A/D converter in a microcontroller.

WEBSEARCH

[1] www.ti.com – search for 'Simple Switcher'
[2] www.ko4bb.com/ham_radio/Projects/24V_Relays/
[3] www.ifwtech.co.uk/g3sek/in-prac/best-of.htm#speedup

Book Review

Two books that do what they say on the cover

Building a Transceiver

Eamon Skelton, EI9GQ and Elaine Richards, G4LFM

I am an unashamed enthusiast about Eamon Skelton's Homebrew column. He has an amazing knack of breaking the most complex projects down into manageable lumps and then describing them in very accessible terms. This book is a case in point: he describes how to build yourself your own HF transceiver *and it isn't scary*.

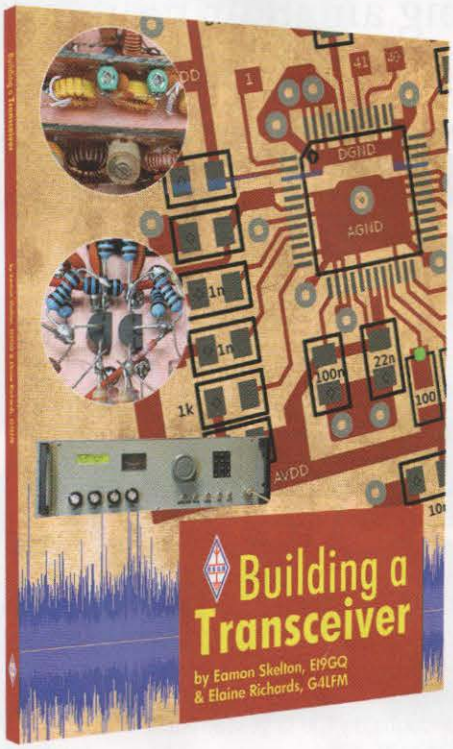
Have you ever looked at a shiny new transceiver and pondered 'how do they do that?' Or wished that you had the knowledge to build your own equipment that could put you on the air and even hold its own against the competition? This book may well be the one that shows you how.

If you've ever opened up a modern transceiver you'll have seen it's full of endless microscopic surface mount components. But this is mainly down to manufacturing convenience: the old ways of using wire-ended components still work fine. And printed circuit boards? Well, they're neat and tidy, but for a great deal of the circuitry involved in an HF transceiver, PCBs are an expensive luxury you can do without. And Eamon doesn't *do* expensive luxury: his circuits are workmanlike and easily reproducible by anyone who can do basic soldering and count the number of turns on a coil as you wind it.

If you follow this book you can end up with a fully working HF transceiver of pretty good performance. Depending on which amplifier circuit you choose to build, your transceiver can have an output of up to 400W – pretty impressive for a homebrew job. On the other hand, the modular nature of the design means that the various elements are easily used in other projects, perhaps either integrating with your own transceiver design or doing a mix-and-match with someone else's work.

Eamon's genius is in the way that that he explains everything as he goes along. Some authors just present everything as if the circuit had happened by magic but Eamon invites you into his design process and shares his thoughts with you. He also isn't afraid to tell us when he tried something and it didn't work the way he expected. Bravo!

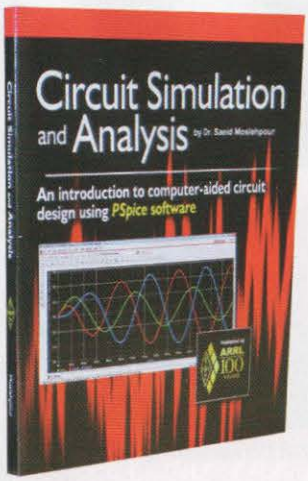
Most of the material in this book was previously published in the Homebrew column in *RadCom*, although there has been a bit of tidying up, incorporating amendments and so on by Elaine Richards, G4LFM. The modular approach of the original articles naturally lends itself to chapterisation, which is how this book works.



In addition to the 'pure' transceiver-based chapters there are also very useful sections on chassis bashing and general construction techniques like making PCBs. Although most of the construction is dead-bug or padboard-style, the occasional PCB is used.

Eamon Skelton's Homebrew column has achieved legendary status in *RadCom*, and deservedly so. Even if you don't decide to construct your own transceiver on the basis of this book, it is still a fascinating read that you will learn a lot from. I can't recommend it highly enough.

ISBN 9781-9101-9301-3
170 pages, 240 x 174mm
Non Members' price £12.99
Members' price £11.04



ARRL Circuit Simulation and Analysis

by Dr Saeid Moslehpour

Computer simulation of electronic circuits really started in the 1970s and powerful tools such as PSpice (Personal Simulated Program with Integrated Circuit Emphasis) are now readily available to the amateur. However, the tools can be tricky to start using – which is where this book comes in.

Starting with a brief history of simulation, the book quickly gets you started with basic concepts such as netlists, entering simple circuits and performing simple simulations such as calculating the frequency response of a straightforward RLC tank circuit. By the middle of the book you're working with transistor models and transmission lines and going on to more detailed, advanced modelling of real circuits with actual component tolerances. Probably my favourite section came at the end, looking at checking how near the simulated design gets to manufacturer's maximum rated operating conditions, using the aptly-named SMOKE ANALYSIS function.

If you're looking for a way to check your designs without warming a soldering iron and want a straightforward introduction to one of the most powerful simulation suites on the market then this book is definitely for you.

ISBN 978-1-62595-005-5, 224 pages, 228 x 188mm
Non Members' price £29.99, Members' price £23.79

National Hamfest & RSGB Convention

Two big amateur radio events this autumn

The 2013 National Hamfest. Courtesy G3UGF.

NATIONAL HAMFEST. Friday & Saturday 26 and 27 September. Organised by the Lincoln Short Wave Club in association with the RSGB and held over two days at the Newark and Nottingham Showground, the National Hamfest is undoubtedly the largest amateur radio rally in the UK.

The success of this rally is evident with ever increasing visitor numbers year on year and with two full days to browse the huge numbers of trader stands, meet with friends, watch demonstrations and try out new equipment, there will be plenty to interest everyone again this year.

For those looking to take home a bargain, come and have a look at the popular Bring and Buy stand or leisurely browse the car boot areas. You never really know what you might find!

Increased demand for space from traders inside the main hall will mean that there will be even more on display this year. Alongside the major manufacturers, Yaesu, Icom and Kenwood, there will be all the major radio suppliers and an increasing number of smaller traders. Whether you are in the market for a new state of the art transceiver, new antenna, antenna mast, feeder, component or small consumable, you are sure to find it at the National Hamfest.

Why not come along and activate the special event station operating throughout the event (bring your licence with you), see the various special interest exhibitions or take the 'on demand' Morse competence test?

Advance discounted tickets are on sale now at www.nationalhamfest.org.uk that will allow speedy access on the day and enable you to miss the inevitable queues. Weekend tickets can also be purchased in advance and, for the first time this year, a camping package is being offered that includes tickets for the event. Come and relax at the campsite at the Newark Showground with other amateurs and spend a couple of days and nights enjoying the hobby.

Because of the high costs of fuel and transport, the organisers thought that they should give you the facilities on the National Hamfest 2014 website to organise and share transport or to get together a group to hire a bus that will bring you to the Newark & Nottingham Showground. A Forum has been added to help you contact others sharing transport. You will have to register on the Forum to be able to post on it: this is necessary to stop people spamming the Forum. Users who abuse the Forum will be banned from using it and their posts deleted. The Forum is only for sharing transport and any posting not relating to this subject will be deleted. Anyone posting any form of advertising other than transport will have the post deleted as the forum is moderated by The National Hamfest and the Lincoln Short Wave Club.

Keep a close eye on the website to see the latest news. Make a note of the dates in your diary. If you only attend one rally this year, make sure you go to the UK's largest and best – the National Hamfest 2014.

To book and for more details visit www.nationalhamfest.org.uk

RSGB CONVENTION. 10th to 12th October. The RSGB are pleased to announce that the Technical Dinner speaker will be Brian Justin, WA1ZMS. Brian is the only amateur in the world to have logged a QSO on all amateur bands (in his home country's allocations) from 160m through to 403GHz, including Experimental Licensing on 630m and 4m. He operates 8 FM repeaters, 4 propagation beacons, is active in VHF Contesting and is a very aggressive SSB contest operator on the HF bands each year during the ARRL's annual Field Day event.

The Technical Dinner talk, Amateur Radio 100 years and More, will be a look back at the first century of amateur radio and will cover topics in a semi-chronological order through time. Topics covered will include but not be limited to: the early days of wireless history with a focus on key UK and EU contributors, the advancements made during WW1, the birth of the short waves that we now know as our HF bands. Advancements and progression of operating modes will be reviewed covering spark, early AM, 1950s SSB, and then an update of digital modes (aka: machine generated modes or MGM) starting with RTTY and up to today's WSJT & PI4 modes. All of these modes will be reviewed in an historical context as to first bands they were used on and how they have taken our fine hobby to where we are today after extension to even more bands.

Unique operating techniques covered will include modes that are less common such as meteor scatter, EME, satellites, modern Cube Sats, balloon tracking, troposcatter and AMSAT outreach to include ISS contacts with potential young amateurs (that he has personally contributed to with the 1st ISS amateur gear). The importance and threats to our very unique radio spectrum will be addressed as well potential ways to grow our hobby and view them in light of 'competition or threat to or from the internet'.

His talk will try and span where the last 100 years have taken amateurs and what we might expect during the next 100 years based on the technology trends we know of today.

The talk will be educational, as inclusive as possible given the time constraints, and include some humour.

The programme is well on its way to being complete and details of the lectures can be found on the website. There will be five streams running on both days. Saturday is HF, Technical, VHF & Up, Contest University and The Wider World of Amateur Radio. On Sunday the streams are Contests, HF, Technical, VHF & Up and The Wider World of Amateur Radio. For details of confirmed lectures see www.rsgb.org/convention.

The RSGB shop is open for weekend packages that can be tailored to suit the individual see www.rsgbevents.org. Early Bird discounts end on 18 August.

Dinner at the RSGB Convention, always a chance for lively debate.

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www.rsgb.org/convention

Martin Atherton, G3ZAY • e-mail: g3zay@btinternet.com

VK9MT team on Mellish Reef - great QSLers (via M0URX).

AWARDS. The 2014 CQ Magazine Hall of Fame inductees were announced at Dayton during May. There are three separate 'Halls' covering amateur radio in general, contesting and DX. This year all the inductees were from the USA so perhaps UK amateurs need to nominate some European candidates next year. Details of current Hall of Fame members and the nominating process can be found in the awards section at www.cq-amateur-radio.com.

Paul, N6PSE and David, K3LP presented Eric, K9GY/T6MO with the Intrepid Spirit Award at Dayton for making over 40,000 QSOs from Afghanistan. The award is in memory of James McLaughlin, T6AF who was killed in Kabul three years ago.

The 2014 Local Hero Award from the UK's CDXC has been given to Tov Boanereke, T32TV. Tov was active from Kiritimati Island (Christmas Island) for many years but has now moved to Washington Island (OC-084). He can be heard regularly on the bands running a solar-powered station. The CDXC Award includes a £100 donation towards a generator, which should allow Tov a longer operating day. The Local Hero Award recognises amateurs who are resident in rare DX locations and are willing to work the pile-ups on a regular basis.

NEWS. The leaders of the KP1-5 team who activated Desecheo Island five years ago have said they are in discussion with the US Fish and Wildlife Service about a new activation of Navassa Island, which is now the #1 most wanted DXCC entity. Things are at an early stage but the team is optimistic that some form of joint operation with USFWS will be possible. It is really quite extraordinary that a US island in the Caribbean has been out-of-bounds to legitimate visitors for so long.

The YW0A DXpedition to Aves Island was postponed at the last minute when the Venezuelan navy changed its plans. At the time of writing there is no information about a new date for the activity.

The 42nd SEANET Convention will be held this year in Bali, Indonesia between 14 and 17 November. Full details can be found at http://orari.or.id/seanet2014/.

Last month I mentioned the ARRL policy on the DXCC status of stations in the Crimea, which basically meant that some calls would count for Russia and other calls would count for the Ukraine. The Ukrainian national society asked for a rethink but the League is maintaining its policy.

Word from Australia is that Bob, VK3ZL who has worked many UK stations on Top Band is recovering from some major surgery and may be home in a few months.

ACTIVITIES. Diya, Z81D, took advantage of an improved political climate in South Sudan in mid-May to be QRV for a few days before returning to his home in Baghdad for a break. He is with the UN World Food Program and is hoping to return to South Sudan in a few weeks if his contract is renewed.

John, K9EL will be back on St. Martin and QRV as FS/K9EL until 27 June. He plans to operate on the 6 to 80m bands running 500 watts into a 3 element Yagi on 6 metres, dipoles for 10 to 30 metres and a vertical for 40 and 80. He also plans to be on 60 metres. He'll be uploading to *Club Log* and LoTW daily. Check Twitter @fsk9el for the latest on his activities.

Jay, K2TTT, will be active holiday style as C6ATT from New Providence Island (NA-001), Bahamas until 21 June on 6 to 40m.

Jose, HP2AT will be active as 3E100PC until 31 August to celebrate the 100th anniversary of the opening of the Panama Canal.

John, W5JON will be active as V47JA from St Kitts (NA-104) from 25 June to 6 August. He will operate SSB on 6 to 160 metres and will participate in the IARU HF World Championship, CQ WW VHF and RSGB IOTA Contests. His wife, Cathy, W5HAM, will also operate occasionally as V47HAM.

S01WS and S01A were QRV from Western Sahara during May. Keep an eye on their sites for hints of future, possibly short-notice, activity: https://twitter.com/SaharaDxTeam and http://saharadx.jimdo.com.

Jorge, CE9OJZ is on Isla Rey Jorge (King George Island AN-010), in the South Shetland Islands until March, 2015. He has a kilowatt to a B&W dipole for all bands.

Members of the Telford and District Amateur Society will be visiting the Isle of Man (EU-116) and QRV as GT3ZME from 26-30 June. Activity will be on 1.8MHz to 24GHz. eam members include M0PNN, MW0UAA, G3UKV, G8VZT, G3JKX, G0ASP, G8UGL and M1FGN. You can follow them on Twitter at https://twitter.com/@paulbowen18 or @paulbowen18 as well as the ON4KST VHF site.

Ivo, 9A3A, operates in Sierra Leone as 9L1A, and returned on 1 June. Unfortunately, both the mains electricity and his generator are unreliable so activity could be irregular. He has an Elecraft K3, 300 watt amplifier, nd wire verticals for 40, 20, 15 and 10, an inverted V for 160, 80, 80, 30, 17, 12 and 6 – but only 7 meters high and a five-band spiderbeam just five meters above his generator shed.

Eric, FP/KV1J will be active again from Miquelon Island, 5 to 15 July. He plans to be on SSB, RTTY and 'some CW', on 10 to 80m and six if it opens. He will be on the DL-DX RTTY Contest on 5 and 6 July and IARU HF World Championship on 12 and 13 July.

RM2A (ex-RW6AML) will be in Fiji and Samoa from 1-13 July: 3D2ML, Beachcomber Island, Mamanuka Group, Fiji (OC-121) 1-2 July; 5W0ML, Upolu Island, Samoa (OC-097) 3-7 July; 3D2ML, Nanuya Balavu Island, Yasawa Group (OC-156) 8-13 July; 3D2ML, Viti Levu Island, Fiji (OC-016) 13 July.

CONTROVERSIAL CHARGES. The issue of charging for QSO confirmations has been controversial for several decades and has resurfaced recently in a number of forums. Originally the discussion was about charging for QSL cards but technology has moved things along and it now includes charging for online Logbook of The World (LoTW) confirmations. As well as the basic charging issue there is concern about discriminatory delays – in some cases the more you pay the faster your confirmation arrives.

Many years ago I was a member of the RSGB delegation at an IARU Region 1 conference where this was discussed at length and a code of practice was adopted that was then published in the Region I HF Handbook. The document is still available from the website at www.iaru-r1.org (check the HF Working Group section) and remains highly relevant. General principles include the following:

DX stations appointing a QSL Manager must


Local hero T32TV (in red shirt) with visiting the DXers.

Antenna array at VK9MT on Mellish Reef.

ensure that satisfactory arrangements are in place for responding to incoming bureau cards as well as direct cards.

QSL Managers must respond direct and within a reasonable period of time if sufficient funds are included to cover the exact cost of return postage and a return envelope.

It is unacceptable to demand a specific number of IRCs or US$ bills if a smaller number would cover the costs.

It is a pity that some DXpeditions are choosing to ignore these principles by charging significantly more than the QSLing cost, refusing to use the bureau, or delaying the provision of QSO confirmation via card or LoTW.

There is a clear case for flexibility for the massively expensive trips where the budget could approach or even exceed half a million dollars but I tend to the view that for most trips the DXpeditioners should fund their own operations. This is not to say that voluntary donations from individuals and clubs cannot be sought – but such donations should not be required in order to get a timely confirmation. The recent VK9MT operation was an example of how it should be done – free bureau cards, rapid LoTW uploads and just $2 or 2 Euro for direct QSLs.

I was pleased to see that the UK's Chiltern DX Club (www.cdxc.org.uk) published a stricter stance last month. If a DXpedition is to receive funding from CDXC then it must comply with conditions that include:

No charge shall be levied under any circumstances for sending bureaux QSL cards or for Logbook of the World (LoTW) uploads.

Direct QSL card charges in excess of $5 are discouraged. Voluntary donation requests are totally acceptable but must be clearly identifiable as such.

The CDXC view is that LoTW uploads should be made no later than six months after the DXpedition but they are keeping this under review. The suggested $5 ceiling may also be a little high but it's a start. Let's hope that other DX Foundations follow suit. Some DXpedition planners have apparently said they adopt a discriminatory approach to providing QSLs and LoTW uploads because it maximises their income. In other words, it works. So perhaps the bottom line is that if more of us can be more relaxed about when we get our confirmations then the practice will die out.

Table 1: 2014 Worked DXCC Entities.

Call	CW	SSB	Data	All
G3UEG	0	230	0	230
G3SVK	211	0	0	211
G4ZOY	143	152	118	196
G3HQT	184	0	102	189
M0BVE	174	0	0	174
G4XEX	1	159	67	159
G4IDL	110	0	0	110
G4FVK	53	78	0	98

Table 2: Forthcoming DXpeditions.

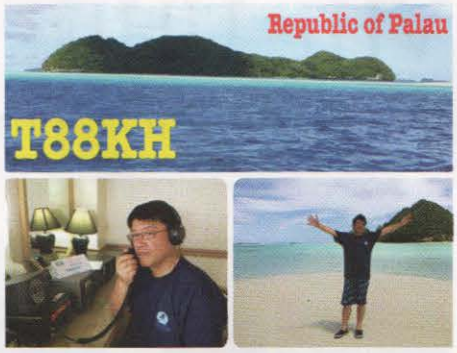
Until 21 June	C6ATT
Until 27 June	FS/K9EL
Until 31 Aug	3E100PC
25 June-6 Aug	V47JA
26-30 June	GT3ZME
1-13 July	3D2ML and 5W0ML
5-15 July	FP/KV1J
29 July-2 Aug	VK9C by JA ops
2-8 Aug	VK9X by JA ops
Late September	5V by OK ops
3-15 Oct	YJ0X
8-29 Oct	ZK3Q ZK3E
30 Oct-10Nov	FT4TA

CORRESPONDENCE. Kenichi, T88KH was QRV from Palau for a few days in May and says he worked 33 UK stations including a couple of 2E calls. Palau is another UK propagation 'sweet spot' that includes the area around Guam and the northern Marianas. Locations further north or east have an auroral path to the UK while locations further south seem to suffer from high levels of absorption. I normally expect to work into T8 or KH0 on 15m even when there are no JA signals on the band.

Fred, G3SVK had a busy month and noted that the HF bands – particularly 20 and 17 – were open long after sunset. He worked a huge range of CW DX with his mix of dipoles so I've had to pick a few highlights: 9M2TO, CX2BR, BA7QT, and ZP8CW on 10; 7P8NK on 12; ET3AA, TZ6BB, BA4TB, V85TL, 9M2/JE1SC, 9V1PW, BV8SI, P29NO, and 3B9FR on 15; VU2GSM, KH8/DL6JGN, VK7CW, 9Q6AL, HC2AO, ZL4PW, BD4AGK, 3D2RH, JR8GPA, HS3LSE, WH7W, 9M2TO, P29NO, BY8DX, VR2UW, 5Z4/JH0CJH, BV1EL, J28NC, JD1BLY, 8J1ITU, 9J2CA, NH0J, HT5T, D2EB, HS0ZEE, DU1KA, RI1ANT, PZ5VB, and JT1E on 17; JH1MDJ, FR5DZ, JD1AAI, VR2UW, XV9NPS, 9N7AA, BD8SZ, TR8CA, JD1BMH, JT5DX, FG8NY, BG3UPA, VK2/G7VJR, and 7Q7VW on 20; CX6VM, HC2AO, HS0ZEE, LU7HN, 4M5CW, VK2IR, 7P8AP, DS4AOW, BY8DX, D2EB and PJ7RV on 30; and XE1XR, 7P8JR, HC2AO, TZ6BB, ZL3XDJ, ZR6CFX, and CX6VM on 40.

Dave, M0BVE reports ET3AA on 15; RI1ANC on 17; FW5JJ, FK8DD, V25M, 7Q7VV, and RI1ANT on 20; and HT5T and PZ5B on 30.

Peter, G3HQT found Iran for an all time new one last month. His QSOs included Lesotho and Cameroon on 12m CW; Ethopia and Mt Athos on 15m CW with Gabon and Iran on 15 RTTY and Singapore on 15 PSK;



QSL from T88KH who worked 33 UK stations recently.

Fiji on 17 CW and Cambodia on 17 PSK; and French Guiana on 20 PSK.

Peter, G4XEX spent most of April above 24MHz and worked: J52HF, ZD7FT, BD6IQD, C5WP, VP8LP, 3B9FR, 7P8YY, 7P8JR, 7P8AP, 7P8OC, D3AA, PY0F/PP1CZ and 5R8UI on 10; VK9MT, DS2CYI, HL2DBP, A35X, P29FR, and VR2XMT on 12; 7P8YY on 15; and A35X on 17 and 20.

Tom, G4IDL had a quiet month and missed Mellish Reef. He decided to let the pile-ups die down before attempting to call but the team's early departure due to bad weather defeated this tactic.

David, G3UEG wrote in to this column, for I think the first time, and gave some background about his activities. He spent most of the time between 1965 and 2000 on Top Band where he has 87 DXCC entities worked and confirmed. He then focused on remote operation from 1999-2010 arguing for the licence change and building the equipment and started chasing HF DX more seriously from 2009. He now has 5BDXCC, WAZ and WAS on SSB.

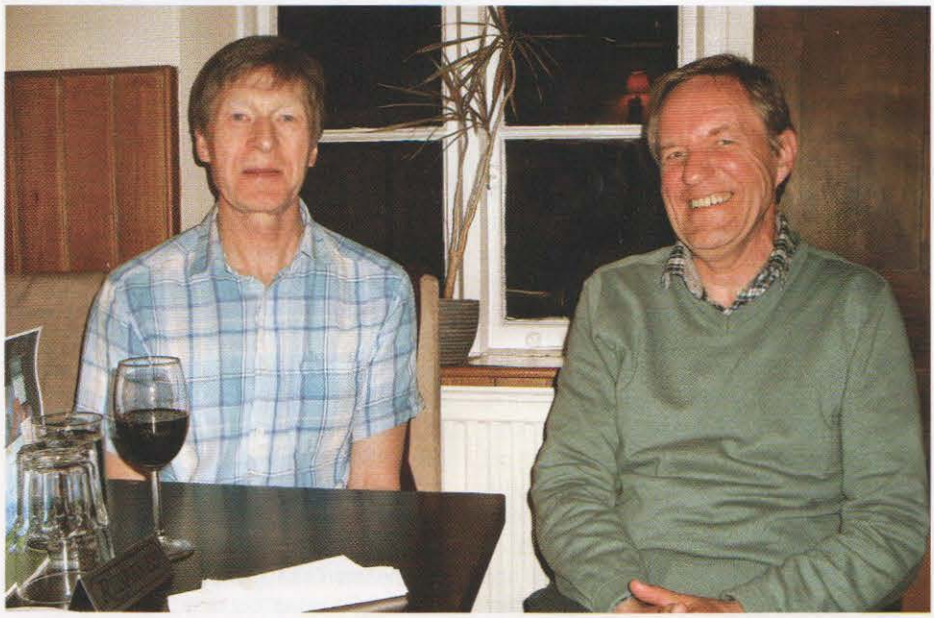
David has very limited space for antennas at home and since 2010 has used a Cobwebb for 20/17/15/12/10m. A few times a year this is supplemented with a 45ft vertical/inverted L for 160/80/40. To make the most of this sunspot cycle he recently installed an Optibeam OB6-2W six element beam for 10m/12m with 4 active elements on each band at about 10m high on a mast attached to the house. "What a difference a beam makes even at a modest height" he notes and goes on to say that the beam has been responsible for 9 All Time New Ones (ATNOs): VK9M, FO/A, VU4, 3C0, FK, CE0Z, S9, FT5Z and ZS8. In addition to the Cobwebb he has built a centre-loaded trap dipole, using parts from an old Cushcraft antenna, covering 15/17 or 15/20 with extended end sections. The antenna is slightly bigger than half size and apparently works very well; having it up high and rotatable compensates for any loss in the traps and loading coils.

That's it for this month. Contributions welcome around the third Monday of each month please. As always, thanks to DX-World, 425 DX News and Daily DX.

July 2014 • RadCom
Richard Staples, G4HGI • e-mail: g4hgi@live.com

VHF UHF

Early Sporadic-E propagation plus extreme EME and tropo



Phil, G3TCU and Graham, G3TCT - 50 years licensed.

INTRODUCTION. There were some isolated UK-EA tropospheric openings on 2m and, with two major RSGB contests in the month, activity was generally good. On 432MHz during the RSGB Trophy Contest and also in the 24 hour 144MHz Contest, there was good activity on both bands enabling some good DX to be worked. Sporadic-E (Es) was evident on 6m and 4m and was just starting to build further when the column was written. There were two small Es openings on 2m but they were well off into Eastern Europe, unworkable from UK. EME conditions were good particularly during the 6W/PE1L expedition to Senegal with many UK stations working them for a new DXCC, initial and locator square. The Eta Aquarids meteor shower peaked around 6 May, characterised by the usual fairly long steady bursts. Despite forecasts of active regions on the Sun, there were no reports of any auroral openings.

50 YEARS CELEBRATION. Having worked both stations many times on various bands, it was great to get a note of 'celebration' from Graham, G3TCT. On 16 April, Phil, G3TCU and Graham, G3TCT celebrated the 50th anniversary of obtaining their licences. Phil and Graham met at the Guildford club and took and passed the RAE on the same day. They later passed the Morse test on the same day and their licences were issued together. G3TCU is still in Surrey whilst G3TCT is now in Somerset and they both operate regularly on 4, 6 and 23cm, with Phil also being heard on 2m. Various items were brought along to mark the occasion – photos of old gear and antennas, a 4m FET converter from 1968, Graham's first log book and a 6060 double triode. The photograph is courtesy of Trevor, G3WBQ who joined in the celebration along with XYLs.

LOGS. Bill, M0BTZ (IO90) sends in the first of a number of excellent multi band logs featuring QSOs on 2m with F6DFI (IN87), F4HBY (IN97), F0FIG/P (JO10), F8GGD (IN95), F1NUM (IN88) F6DFI (IN87), EA1MX (IN73) and EA2XR (IN83). On 4m, Bill unfortunately missed the 70MHz Sporadic-E opening to Poland (SP) on 16 May but he did manage to work Steve, GW0GEI (IO72) on SSB for a new square and also G4FZN/P (IO94) on 29 April with just 10W and HB9CV. Bill has also been a keen supporter of 70cm operation, both during contests and the weekly activity periods completing QSOs with G4VFL/P (IO84), GD8EXI (IO74), DF0MU (JO32), G4HGI (IO83), PA2V (JO22), DF2VJ (JN39), PI4GN (JO33), PA5KM (JO11), PA6NL (JO21) and Frank, PE1EWR in JO11. He also worked Dave, G7RAU/P who was on expedition to IN79 on CW.

Bob, G8HGN (JO01) caught Sporadic-E openings on the lower VHF bands. 4m QSOs included EA7BPO (IM76), SO8FH (KO10), SP7BUZ (KO00), SQ9QU (JO90), 9A3WL (JN86) and 9A2SB in JN95. On 6m, Bob worked IW2CAM, I2PJA (JN45), LZ2WO, LZ2014 (KN23), HA0NAR (KN07), SP5SS (KO02), YO4AUL (KN44), SP7EXY (KO00), ER1SS (KN46), YO8SCT (KN37), YO8ROO (KN36), YP10NATO (KN16), IZ7FLP (JN80) UX5NW, UW8SM (KN28), ER1MM (KN47), CN8LI (IM63), 9A5CY (JN85), EA9PY (IM75), EA3EVL (JN00), HA6NY (JN98), HA3HX (JN86), SP9AI (JN99), HA2ERO (JN87), IK8EVE (JN71), IC8BNR (JN60), EA5IDG (IM97), EA3AYQ (JN11), EA5BX (IM98), EA6SA (JM19), EA5UB (JM08) and a real DX QSO with ZD7VC (IH74DB) in St Helena at 7532km. On 70cm Bob worked PI4GN (JO33), DF2VJ, DF2GB, TM57M (JN39), ON4PS/P & ON4KBE (JO20), PA8R (JO22), DL6AA (JO43), DK0PU, DL4EAX & DL0LN (JO31), PA5KM (JO11), DF0MU (JO32), DH1TS (JO30), PA0WMX (JO21) and best DX DL0GTH in JO50 at 728km. Highlights on 2m during May were OZ1ALS (JO44) in the 144MHz UK Activity Contest, plus DF1WS (JO30), F1BJD/P (IN98) and DK5DQ (JO31) during the May 144MHz Contest.

Lyn, GW8JLY (IO81). On 6m there had been a number of Es openings most of which Lyn missed. However on 1 May Lyn did catch an opening working IS0DCR in JN40. In a much better opening on 7 May, he also worked several HA stations, YP10NATO (KN16), YO5OHY (KN17), YO6DDF (KN16), YO5PHQ (KN17), YL2GB (KO26), F4AZF (JN39), DL2MWB (JN57) and IS0BSR/P (JM49). On the 9th, many SP, OK and DL stations were logged and on the 10th, right at the end of the opening just as Lyn had returned home, ER1SS (KN46), YO8SCT (KN37) and YO8ROO (KN36) were worked. On 2m, apart for a brief tropo opening on the 5th when he worked EA1MX in IN73XK, tropo openings were completely nonexistent. The European contest on 3 and 4 May enabled Lyn to work into F, ON, PA and DL with the best DX being DF0MU in JO32. Meteor scatter conditions are much improved since the end of April and were particularly good during the Eta Aquarids meteor shower that peaked on May the 6th. This shower is known to produce long reflections and although this year's shower was not one of the best, Lyn noticed several very long bursts during some of his many MS QSOs. Some of these were over a minute in duration and could easily have supported single burst SSB QSOs, a mode sadly under used. In fact, during the contest on the 4th, while listening to F1UVN (JO10) who was a solid 59 throughout the whole contest, he noticed a very strong

signal just high of F1UVN's frequency. Tuning in Lyn was surprised to hear OE5LHM/P calling CQ, obviously via meteor reflection. Waiting patiently for his CQ call to end before calling him and giving a contest exchange, expecting to surprise the station with some GW DX in the log. However, after Lyn had finished his transmission the OE commenced a new, even longer CQ contest call and it was then that Lyn noticed he hadn't switched on his PA so was calling with just 5 watts driver power! By the time he had finished this 2nd call, the signal was fading as the reflection had ended. Despite many MS QSOs the only new locator in the JLY log was IO68 courtesy of a side scatter meteor QSO with GS3PYE/P. Unfortunately the moon had not been in a favourable position to make any EME QSOs.

Mike, M5MUF (IO92), says he has been finally shaken out of idleness by the arrival of the Es season. His first 6m opening was on 7 May and 4m on the 16th. Running just 50W to a low 1-ele quad loop on 6m is not very competitive, however there were some nice 'gottaways', including 9K2GS, CN8LI, C31CT and 4X4DD all heard but not worked due to un-crackable pile-ups. Most QSOs were on SSB, but Mike dusted off the key to work a couple of Ukrainian stations. On 6m Mike worked YL2GB (KO26), IS0BSR/P (JM49), OK1DO (JO60), OK1JR (JO70), OK7GU (JN69), UT4UEP (KN49), OK2IPW (JN99), UW8SM (KN28), HF650S (JN99), S53K (JN75) and IC8BNR in JN60. Mike also comments that Italian activity on 70MHz is sadly missed as the band was well open to that area on a couple of days. Through the often wicked QSB and massive OIRT QRM (Organisation Internationale de Radiodiffusion et de Television FM radio stations in Eastern Europe) Mike worked SO8FH (KO10), SP7BUZ (KO00), YO2LAM (KN05), SP8NCJ (KO12) and SQ9QU, SQ9V and SP9BIF in JO90.

John, G4SWX (JO02) reports tropo conditions being pretty grim during May. Concentrating on EME produced excellent results with a few FSK441 meteor scatter QSOs when there were any interesting stations about. The Nordic activity contest on 6 May was typical of the very poor tropo conditions. Best DX was SK7MW at only 837km with none of the more distant 'regulars' being heard. Meteor scatter reflections were 'fair to middling' with an easy QSO on 23 April with UA1ZFG/1(KO46) a new square and also GS3PYE/P. Moonbounce conditions were described by John as 'fantastic'. On 4 May he worked Arliss, W7XU in South Dakota (EN13) for state # 49. On 5 May, Joe, K9KNW in Wyoming (DN63) was logged for US State No 50 so that is Worked All States completed! K9KNW was running just 300W and 2 x 9-ele Yagis. The crowning moment was on 7 May at 1433 working Rene and crew at 6W/PE1L (IK14) in Senegal for John's 100th DXCC entity. He managed to get through the huge pile-up about 40 minutes after the first transmissions from Senegal. The Atletico Team have now worked many G/GW/GM/EI stations via EME. Another highlight for John was also working George, SV9AQI KM25 on 12 May. George is new to EME and runs just 200W and a long feeder into an 11 element LFA Yagi. The big number is that 608 locator squares have been worked since his return to the 144MHz band in July 2011. John also completed a tropo + meteor scatter sked with Fernando, EA8TX. The sked was made looking for potential tropo enhancement on 15 May when the F5LEN tropo predictions showed possible fine conditions to the North East from EA8. Looking for a meteor scatter link the QSO was completed in just under 2 hours from JO02RF to IL18QI, which calculates at 3048km. The F5LEN tropo predictions based on the Hepburn model can be found on his website [1].

Peter, G8BCG continues with his own brand of extreme DX on 6m with a daily diary. The 5th was a big night for TEP into UK. Peter wasn't on air that night but on his HF vertical at home in the valley he heard LU5FF at 559 and LU9AEA weakly working USA. On 6 May, TZ6BB was copied for a couple of hours and very busy. EME conditions were very good so Peter had a quick QSO with Lance, W7GJ on his usual CQ EU moonset session. There was a very localised TEP opening where LU5FF, ZP6CW and ZP5SNA all very good signals. ZD8VHF beacon was audible but weak, however no other TEP signals were copied. Peter rounded off the night with a new EME initial with KG7H. On 7 May, the Sporadic-E season started with big afternoon signals from across Europe plus a brief extension to ZS4TX. ZP5SNA was also heard calling. On 11 May CE3SX was heard working EI6JK plus FG8OJ also on 50.110MHz. On the 12th and 14th, good afternoon Es openings to Europe brought QSOs with EA9, ZB2, CN8, EA7,6, 5, 3, 2, LY, SP, DL, CT, HA, 7X, OM then from 1930UTC PY3KN, LU5FF, PP5XX, PU3LYB, PY5QW and PY2DL. 9J2BO was heard on 16 May but A25GF, who was copied under incredible southern EU pile up signals, was sadly a gottaway. Between the 17th and 20th, there was plenty of morning European Sporadic-E including LZ2015KM on SSB and UX1BZ on CW. However the 'main' event was working SO1WS from Western Sahara and DXCC #228! This was on top of openings to South America where PY, LU and ZP were heard. There was also late afternoon Es across Europe with some multi hop and linkage to TEP. Further QSOs were made including 4X1IF and Z21GF. There was also excellent E's linkage to Trans Equatorial Propagation and 9J2BO was copied well over S9 at times and Z21GF not far behind – both for over 1 hour.

6W/PE1L SENEGAL EXPEDITION. Anyone who has been following the daily updates from the Atletico Team expedition to Senegal couldn't help but be amused by their culinary arrangements during the expedition. It seems, at the beginning, Rene, PE1L, Eltje, PA3CEE and Hermann, DI2NUD had to survive on a diet of fresh fish, onions and rice until they established further lines of supply of different cuisine. As the expedition came to an end, here are some vital statistics that make this the Atletico Team's best DXpedition yet. Here is the team's final 'sign off from Senegal'.

"This was our best ever DXpedition. We shattered all records – 144MHz: 455 initials &, 58 DXCC; 432MHz: 25 initials &13 DXCC; 1296MHz: 27 initials & 15 DXCC; 2320MHz: 7 initials & 6 DXCC. On four bands, a total of 514 unique initials is an absolute world record. The C56EME expedition in 2011 achieved 372 initials in total on VHF/UHF moonbounce. Another tremendous thrill was with tropo testing on both 144MHz and 432MHz resulting in fantastic DX over 2840km with CU3EQ on both bands. On 432MHz this DX comes in the top five IARU Region 1 DX records. We also tested with FM8DY (4707km), pings were heard on both sides, but sadly not complete, but it was a serious attempt. Success has two sides, good operating practice and well balanced equipment including plenty of spare parts (in total 184 kilograms). TX Yaesu FT-857d with TCXO. RX IQ+ by HB9DRI. Preamps WA2ODO / M2inc. Antenna: 2 x 8-ele IOJXX. Antenna Control System DRIACS-G3 by HB9DRI. Good EME power amplifier by ITALAB." Catch up with the final expedition shake down on the team's website [2].

MORE EXTREME DXPEDITIONS. Don't forget the Brendan Trophy attempt that is scheduled to take place from Pouch Cove, Newfoundland (GN37os), from 4 to 12 July. Details and daily updates on the expedition can be found on the team's website [3]. Real time information on operating modes and schedules will be posted during the expedition on the team's website, the ON4KST site. Facebook users are also welcome to join the group's page Brendan Quest 2m metre Transatlantic Attempt 2014.

SIGN OFF. Many thanks for all the contributions this month, hopefully next time there will be more Sporadic-E reports higher up in frequency to 2m.

WEBSEARCH

1: http://cluster.f5len.org/index.php?p=tropo
2: www.emelogger.com/6w
3: www.brendanquest.org

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Dr John Worsnop, G4BAO • e-mail: john@g4bao.com

GHz Bands

An update on the 2.3GHz changes and an inexpensive homebrew low noise preamp

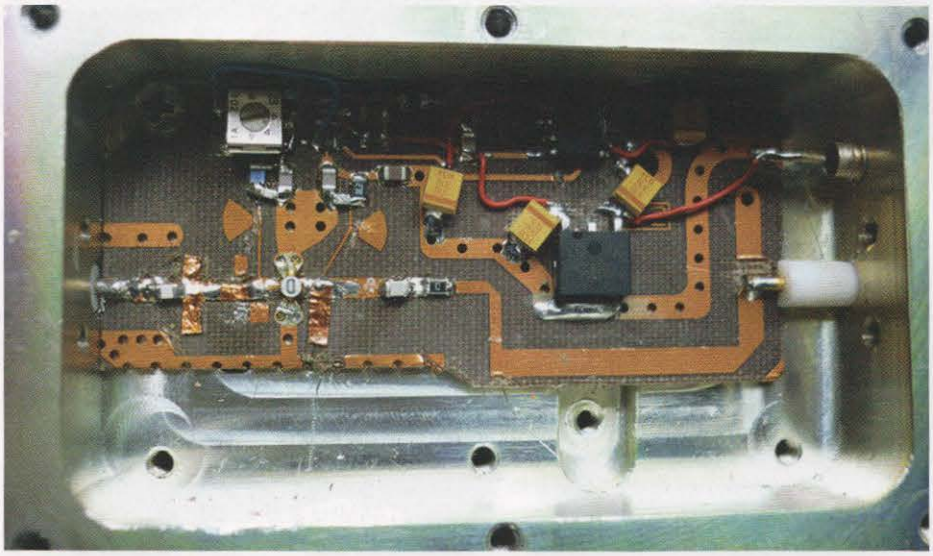

PHOTO 1: G4DDK's 5.7GHz preamp made from a 'Franco' board.

2.3GHz CHANGES. First of all, an erratum from last month's report of the changes to 2.3GHz section of the monthly SHF UKAC contests. Unfortunately, the Contest Committee changed its mind after my deadline so the event has NOT moved to Sunday night as I reported. The 2.3GHz sessions will be on Tuesdays from 2030Z-2230Z (2130-2330BST) for May, June & July only, then revert to normal times from August as sunset will then be before the 2030BST start. The 3.4/5.7/10GHz sessions stay put on Tuesday 1900Z-2130Z (2000-2230BST). This change has brought about lots of discussion on the reflectors, with some people unhappy about every proposal that's been made. In my opinion just continuing with the *status quo* and hoping we don't cause any problems is not an option. Outside the contest it's crucial that we all do the signal calculation that I described last month and tailor our signals in to the 'danger areas' to suit. It's also very important to register your activity with Ofcom as described last month, by emailing pssramateurs@ofcom.org.uk with your name, address callsign, location of use, frequency range used, type of use (such as terrestrial weak signal working on CW, MGM modes and SSB), regularity of use (eg evenings and weekends; 24/7; occasional) and transmit power. This is not just so Ofcom can contact you in the event of interference, but it is likely that they will treat this information as a measure of activity, and we don't want to see a big discrepancy between this and the strong response to the consultation. I know my cautious approach has got me some criticism, but I want to keep 13cm and strongly believe that we really must be careful to avoid any possibility of interference to primary user during the restricted daylight hours.

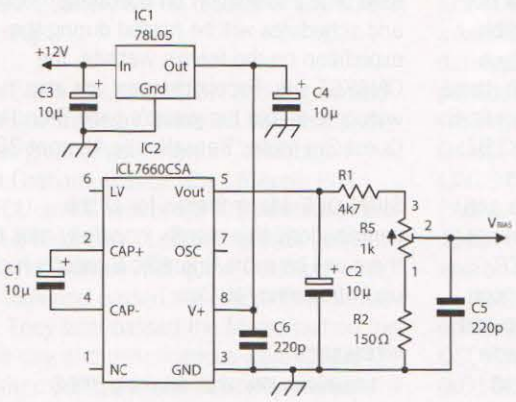

FIGURE 1: Bias supply circuit.

INEXPENSIVE 10 OR 5.7GHz PREAMP. One of my 'must visit' trade stands at the Friedrichshafen show is RF Elettronica, run by Franco Rota. Not only is Franco a very friendly guy, but his collection of RF parts and surplus is a must for anyone interested in the GHz bands. Franco also runs an excellent web shop [1] where, if you search the surplus section [2] you'll find some ex LNB boards type SU-02 for just €3 each. These boards contain 4 x NE32584C HEMTs but, more than that, the PCB can be cut up and scavenged to make preamps and/or doublers with just a few extra bias components. A 10GHz preamp and 24GHz doubler using the PCBs was covered in excellent article by Gerrard, F6CXO in the now sadly defunct *VHF Communications* magazine issues 3/2004 and 1/2005. A reproduction of the original articles can be downloaded from Franco's website at [3]. I've made a couple of 10GHz preamps based on Gerrard's work, built into home-made milled boxes and got around 12dB gain and around a 1dB noise figure from them. Talking to Sam Jewell, G4DDK recently, he told me that he'd also made a very respectable 5.7GHz preamp from the boards as well. **Photo 1** shows the cut down SU-02 and the 'tabs' he used to match the device on this band. You can work out the approximate size and position of the tabs using the HEMT device (marked D) as a size reference. Sam's preamp produced a similar 12dB gain and 0.9dB NF as the 10GHz version. He built the positive and negative bias circuitry ugly style on the existing scavenged PCB, which is fine, but I have done a tiny (24 x 18mm) SMT board that should fit inside a small milled box, see **Figures 1** and **2**. No originality is claimed for the circuit: it's simply a re-layout of the bias circuit used in the highly successful VLNAXX series of preamps.

ULTRA LIGHTWEIGHT 1296MHz EME. I've recently returned from a highly successful trip to the island of Lewis with the Camb-Hams [4]. With just a minimal 1296MHz system consisting of a TS-2000X, a VLNA23 and a 150W SSPA running in to a single 55-ele Tonna Yagi, GS3PYE/P managed 13 EME 'initials' on JT65c with 10 DXCC entities in Europe, Asia, North and South America. Thanks to Al, K2UYH, we managed to work the ARRL centenary callsign W1AW after we had worked him under his own callsign. 'Gotaways' included Dave, VK2JDS who decoded us and we briefly saw his signal at moonrise, but no decodes. This was certainly down to the effect of our Yagi's poor side lobe noise performance, discussed in this column recently. The EME antennas (**Photo 2**) took a battering from the wind and if you look carefully at the 144MHz antenna you can see how much it was bending in the Hebridean wind as Gavin and I struggled to protect the 'PA in

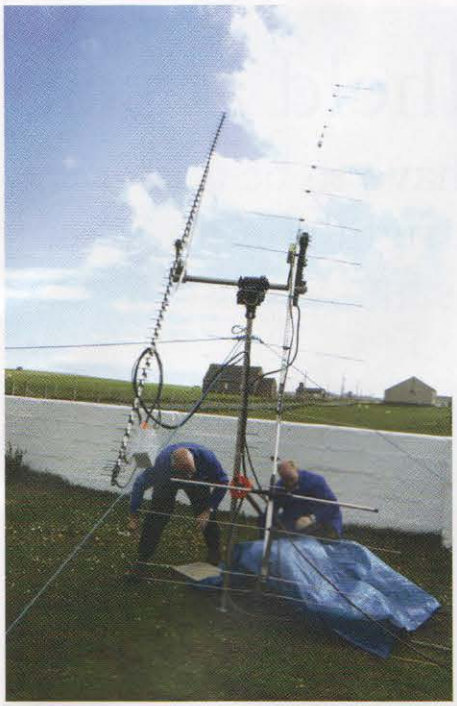

PHOTO 2: The GS3PYE/P EME antennas with Gavin, M1BXF (right) and me. Photo: M1ACB.

PHOTO 3: The 'Combe Gibberlets' contest team's low bands contest setup. Photo: G1EHF.

a toolbox' I described last month from a sudden rainstorm.

This activity proved to me that EME with very small systems is possible and worth a try if you have no space for a dish, but do have a long Yagi and a bit of power on 23cm. It gives those with poor QTHs for Tropo a chance to work some microwave DX. Look at the HB9Q website [5] for the list of the small stations they have worked on JT with their 10m dish and you'll get an idea of what's possible with similar QSO partners. Don't expect to work everyone, but with a well engineered station, 100W plus a good preamp, the big stations are easily workable and it's great fun and a challenge.

UKuG MAY LOW BAND CONTEST. Dave, G1EHF reports that the marvellously named 'Combe Gibberlets' contest team entered the May Low Band contest from a site to the East of Guildford in IO91RF using their new callsign M0HNA/P. At the time of writing they were band leaders on all three bands 1.3, 2.3 and 3.4GHz. Weather conditions were fine, not too hot and with little wind, whilst radio conditions seemed quite average on all bands. Activity however was reasonable: 40 worked on 23cm, 20 worked on 13cm, with best DX PI4GN at 547km, and 7 worked on 9cm, with best DX PI4Z at 309k. The 23cm station was operated from G3TCU's new mobile shack, constructed in the back of a people carrier donated by a benevolent colleague! **Photo 3** shows their very well engineered setup.

EME ACTIVITY ON 3400MHz. The 9cm leg of the *Dubus* EME contest took place at the beginning of May, so activity shifted to that band for a week or so as people prepared their systems. Howard, G4CCH was active between 2 and 8 May and in the contest made 26 QSOs with 17 DXCC entities and added five 'initials' to his standings. For the uninitiated in EME, it's convention not to just log DXCCs and squares but 'initials' who are stations you work for the first time on EME. Howard missed a few stations, but was able to add another initial later in the week with DL2LAC. He described the week as "really good fun too!" Howard runs a 5.4m homebrew dish, with a scaled N2UO septum feed, 100W SSPA at the feed point & G4DDK VLNA of 0.4dB NF. Peter, G3LTF used his rebuilt dish (see June GHz Bands) to work 26 stations, all random CW. Manfred, DL7YC was QRV and worked 23 different stations, 9 initials, 5 new squares, 2 new countries and one new US state.

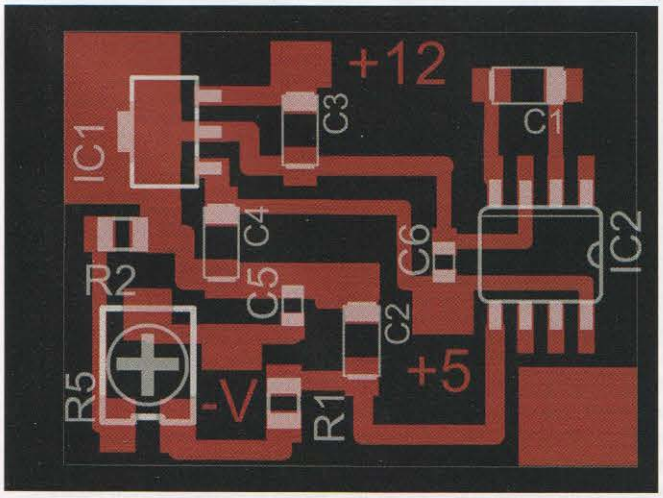

FIGURE 2: PCB for the bias circuit shown in Figure 1.

BEACON NEWS. John, G3XDY (JO02ob) reports that the Martlesham 1.3GHz beacon driver was changed over to new hardware on 21 May and GB3MHL has now become GB3MHZ. The new driver is RDDS locked to a 10MHz standard signal so should be more stable. The keying has changed a little: the beacon now just sends callsign and locator every minute using FSK CW with 400Hz shift and plain carrier for the remainder of the time. Nick, GM4OGI who's based in Germany, reported his first ever JT4G decode of the GB3PKT 10GHz beacon on 21 May. Interestingly, he has monitored for the beacon for quite a while now and while the FSK CW id was confirmed very soon after monitoring started, this is his first JT decode. Food for thought in the JT vs CW discussion!

WEBSEARCH

[1] RF Elettronica web shop – www.rf-microwave.com
[2] The SU02 surplus board – www.rf-microwave.com/eng/shop/0/5-equipments-pc-boards/4-SU-02.html
[3] 10GHz preamp and 24GHz doubler using the Su-02 – www.rf-microwave.com/datasheets/4_generic_SU-02_01.pdf
[4] Camb-Hams Isle of Lewis Blog – dx.camb-hams.com
[5] QRP EME at HB9Q – www hb9q.ch

Andrew Work, PA8NPT/G8NPT • e-mail: pa8npt@telecomsynergy.com

A 70cm handheld at sea

A QSO doesn't always have to be a challenge, but with the right conditions the result can be a pleasant surprise

The return journey, on board the sister ship *Pride of Rotterdam*.

I often need to travel for my work, usually by air. So, when I travel to England to visit family I like to enjoy the leisurely pace of traveling by sea. Wednesday 19 June 2013 was a warm sunny day, one of the first of the year. The ferry I often use sails between Rotterdam (Europoort) and Hull. This time I had my Wouxun 2m/70cm handheld with me.

The ship was the *Pride of Hull*, one of two almost identical 'superferries' capable of carrying over 1000 passengers for the 16 hour crossing to the north of England.

Whilst still in dock in Europoort, I held the Wouxun against the cabin window and I could hear the 2m repeater at Rotterdam and the 70cm repeater from the across the river at Hoek van Holland. I was curious how well it would perform from the upper deck when at sea.

After dinner, I retired to the reading room where the ship has onboard satellite WiFi. Whilst chatting to Mariëtte, PA1ENG via the internet, the ship set sail. Mariëtte, PA1ENG followed the progress of the ship out of the Maas via APRS (http://aprs.fi). We decided to attempt a QSO via the 70cm repeater in The Hague, PI3HGL.

By this time the ship was now out at sea. I went to deck 12, with my handheld and a speaker-microphone. Outside on deck the wind was strong and the speaker-microphone was definitely going to be needed if I was to be able to hear anything above the wind and the noise of the ship.

Mariëtte, PA1ENG came back on first call and the signal as good. The outside deck, which is open to the public on the *Pride of Hull*, is at the rear of the ship, facing the Netherlands. The Dutch coast was no longer visible and a thick fog was closing in despite the cold wind blowing – the warm summer's day seemed a long way away. It seemed as if nobody else dared venture out on the deck! A few smokers put their head outside the door and quickly went back inside. The ship's foghorn was sounding regularly now, adding to the feeling of isolation. All this time the signal from the repeater was holding up, despite using only a small whip antenna on the Wouxun. The

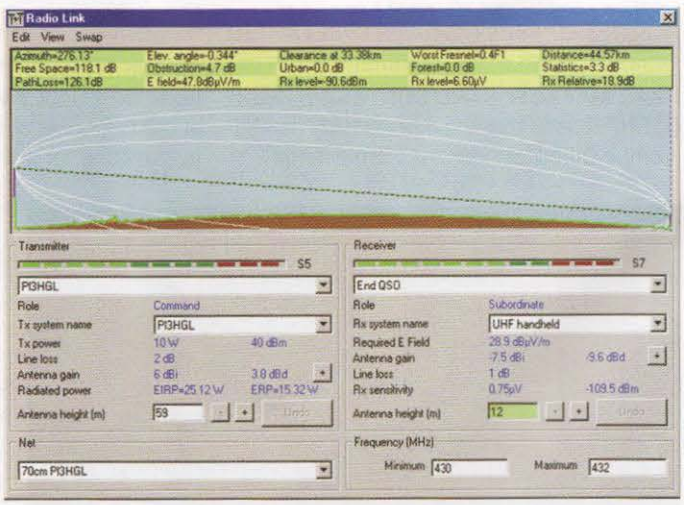

FIGURE 1: The path profile shows there were no special propagation conditions, but a direct line of sight path. The path profile shows that 44.5km is about the point where the first Fresnel zone is begins to be obscured by the horizon. The path profile is but an approximation because the exact height of the outside deck is unknown (I have estimated it to be 12m above sea level). Also the efficiency of the whip antenna on the Wouxun is unknown. The distance of 44.5km is correct, derived from the APRS data.

So simple, a handheld at sea.

Recharging the Wouxun inside a warm cabin!

handheld was placed on top of the metal railing in an attempt to create some sort of ground plane. I kept myself at arms-length from the handheld to allow maximum signal to be radiated and not absorbed by my body. Holding the transceiver in one hand, I looped my other arm around the railing in order not to get blown over, as the sea was a long way below. That way I could still hold the speaker-microphone to my ear to hear above the wind and the eerie sound of the foghorn. It was quite strange to think that it was a fine summer evening at the other end of the radio connection.

The QSO lasted more than half an hour, during which time quite a few stations were worked and logged by Mariëtte, PA1ENG (since I had my hands full just holding onto the ship's railing). The photographs would have to wait for the return trip from Hull...

Mariëtte, PA1ENG was still tracking my location via the internet and I therefore knew how far from the coast the ship currently was. At 45km from the coast my signal was starting to occasionally drop out from the Hague repeater, PI3HGL. Still, that with just a few watts at 70cm into a very inefficient whip antenna! Whilst the signal was still good enough to continue the QSO a bit longer, I decided it was more sensible to return indoors as the wind was increasing.

As it turned out, this was approximately the point (45km from the Dutch coast) where a QSO with the repeater would no longer have been possible anyway.

On the return journey from Hull to Rotterdam, I took some photographs on board the sister ship, the *Pride of Rotterdam*. Later I made a path profile (**Figure 1**) from the repeater to the location of the end of the QSO, the coordinates of which were determined from the APRS data (**Figure 2**). It can be seen that technically this was in fact an easy and repeatable QSO and that there were no special propagation conditions involved. The atmosphere because of the weather at sea and distance from the coast did make it a rather special experience though!

UPDATE. Since the original QSO, I have worked 2m FM departing from Hull to Rotterdam. Andy, G7LRR in West Hull was an incredible signal on 145.550MHz even when the ship was well out of the River Humber and at sea. I have also worked mobile stations in Grimsby, Lincolnshire and across East Yorkshire on 2m on subsequent trips, all using just the factory supplied whip on the Wouxun handheld. The height of the public deck on the ships being a significant factor in the success of the QSOs.

I wish to thank Mariëtte, PA1ENG for her cooperation in the writing of this article.

FIGURE 2: A look at the shipping routes shows quite a few opportunities for working 70cm repeaters during the voyage. Although some QSOs may need to be scheduled as the ship reaches the UK coast in the middle of the night, before following the coast up towards Hull. Also worth considering is the direction of travel, since the publically accessible outside deck is at the rear of the ship. For example, PI3HGL in the Hague is best when leaving the Netherlands, whilst GB3NU and GB3NN can be heard in either direction, being to the side of the ship's route.

Note: UK licencing conditions require a Full licence to operate Maritime Mobile. Other relevant terms include:

5(3) When operating the Radio Equipment from a Maritime Mobile location, the Licensee shall cease to operate the Radio Equipment on the demand of the Vessel's master.
9(4) Before operating the Radio Equipment on a Vessel, the Licensee shall install, use or make changes to the Radio Equipment only with the written permission of the Vessel's Master.
9(5) Whilst operating the Radio Equipment on a Vessel, the Licensee shall observe radio silence on the advice of the Vessel's Master.

In this context, "Radio Equipment" basicallly means your amateur gear.

Dave Mann, G8ADM • e-mail: g8adm@gb3bh.com

ATV

More about microwaves

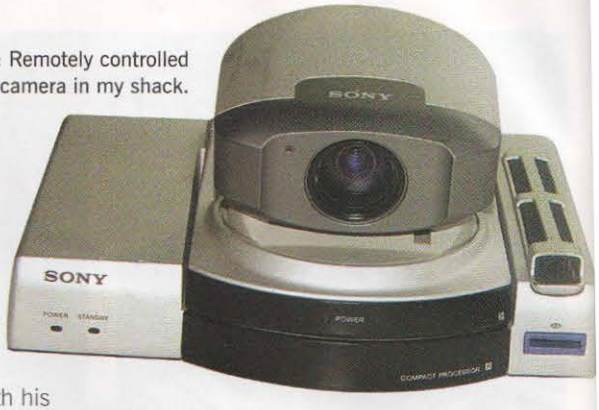

PHOTO 4: Remotely controlled camera in my shack.

PHOTO 1: Fixed dish antenna at MOSAT pointing at the local 3cm repeater.

3cm. The 3cm (10GHz) amateur band has traditionally been thought of as highly specialised and difficult to use. With the current pressure on the use the spectrum at lower frequencies there is greater use of the microwave bands by ATV amateurs and repeaters. Now with the very large use of satellite broadcasting, very high quality equipment for the microwave bands is available at modest cost. In the early days, amateur microwave TV transmitters used Gunn diode oscillators generating a few milliwats of power with frequency modulation provided by modulating the power supply voltage with the television video signal. Using this with a big dish antenna we felt pleased to achieve a few kilometres range. With modern systems we now regularly receive P5 pictures over ranges of hundreds of km in good conditions. Recently the GB3BH repeater in North West London was being received at P5 in the north of the Netherlands on 10.065GHz. Bob, G7AVU also receives BH regularly near Lincoln over a 180km path with his 90cm dish at near ground level. Of course, unlike the lower frequency bands, you need a path that is not obscured by local trees or buildings.

It is now possible to generate accurate 10GHz signals using PLL oscillators and surplus power amplifiers producing 10W or more for as little at £50. Search for 10GHz amplifier or 10GHz power amplifier [1]. Higher power amplifiers are available from the specialist amateur suppliers [2] [3]. Signal sources are also available from [3] and in kit from [4].

The simplest way to try the 3cm band is to start receiving. This is usually done by using a modified satellite LNB to down convert the 3cm band to L band as used by a regular analogue or digital satellite receiver. The modified LNBs have their local oscillator changed to 9GHz. To receive, say 10.065GHz, the receiver needs to be tuned to 10.065 – 9.00 = 1.065GHz. Satellite receivers tune from 950MHz to 2,150MHz so this is within their tuning range. Modified LNBs are fairly readily available: search for ATV LNB on the usual internet sites [1]. If you wish to modify an LNB it is necessary to replace the dielectric resonant oscillator (DRO) disc with a slightly larger version that will resonate at 9.0GHz. LNBs with PLL local oscillators are becoming available that can be retuned by replacing the crystal in the PLL circuit. All this would be a fairly skilled job requiring knowledge of surface mount soldering techniques.

There are two types of LNB. The first type has a built in antenna or horn designed to fit to a conventional satellite dish antenna. These dishes with an offset feed must be pointed downwards in order to beam along the ground, as shown in **Photo 1**. The other type is an LNB with a waveguide feed that fits onto a simple horn antenna, as shown in **Photo 2**. Dish antennas provide more gain but can be difficult to align on the signal whereas horn antennas are lower gain and therefore have a wider beam width. Portable operation also lends itself to microwaves. **Photo 3** shows John, GW3JGA operating from a local hilltop receiving a distant 3cm repeater, GB3FY in Fleetwood, Lancs.

PHOTO 2: Horn antenna for 3cm mounted on my mast.

PHOTO 3: GW3JGA/P receiving GB3FY on 3cm.

OTHER MICROWAVE BANDS. As mentioned in the November column, the 3.4GHz (9cm) band is beginning to be used in the UK by ATV repeaters. Much of the foregoing also applies to this band. The first repeater to have a 3.4GHz digital output is now operational: GB3KM in North Yorkshire. We will also be seeing use of the 5GHz band in the near future.

I hope that you will try ATV on the microwave bands, it may be easier than you think! Please e-mail me as above with any questions.

REMOTELY CONTROLLED CAMERAS. It is very convenient to have a camera in the shack that you can adjust the pan, tilt and zoom from your chair by remote control. These cameras have traditionally been very expensive. Cheaper solutions have more recently appeared on [1]. The secret to finding them is what you put in the search box. To find a camera like that shown in **Photo 4** with a handheld IR remote control, search for Conference Camera or Teleconference Camera. I bought the one shown for less than £10 and it works well – with a 15:1 zoom lens included.

WEBSEARCH

[1] www.ebay.co.uk
[2] www.kuhne-electronic.de/en/
[3] www.dg0ve.de/en/
[4] www.minikits.com.au/

ATV Contest Dates

13 – 14 September: International ATV Contest
6 – 7 December: BATC Repeater Contest

Details at www.batc.org.uk

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Steve White, G3ZVW • e-mail: steve.g3zvw@gmail.com

Sport Radio

The tale of an unwelcome visitation, just before a contest

PHOTO 1: Overview of the South Birmingham VHF NFD site.

PHOTO 2: Why you should never share your camp bed with a cow.

CHALLENGING TIMES. VHF NFD 2013 was no different to any other contest that South Birmingham RS participates in. G7RPP from SBRS told me, "In the lead-up to the weekend there are always things that need doing, including the building and testing of equipment, deciding what to take, sorting and loading the trailers, liaising with the site owner and ensuring there would be food and drink available for all the members on site. A visit was made to the site, to ensure the owner was still happy for us to use the field at Shenlow Hill (IO92GB), just outside Shennington (overlooking the glider club and Go Kart track, both formerly part of RAF Edgehill).

"We arrived at site on the Friday afternoon and immediately started to distribute the trailers, equipment and masts to their positions. The 4m & 6m stations would operate from our large box trailer located next to the hedge, the smaller white trailer was located next to the trig point and would be the home for the 23cm station, our large white tent would be positioned South of 23cm and be home for the 70cm station, cooking, storage and socializing [no 2m station]. It was felt that by positioning the 70cm station south of 23cm they would pose less of a problem to each other. On previous events there were times when both stations were working weak stations to the east, one often ended up beaming at the other. With the majority of the contacts probably to the east, avoiding interference on our own site was desirable, though not guaranteed.

"With the final station locations agreed, the last of the equipment was distributed to them (**Photo 1**). It was then time to do as much of the installation and construction work as possible, prior to leaving site for our evening meal at The Bell pub in the local village. The 6m, 23cm and 70cm antennas were assembled, with the 6m and 23cm ones mounted on their respective masts, stood up and cabled. The tent to be used for 70cm, the ridge tent and the toilet tent were erected. Those members camping also erected their homes for the weekend. Power from the generator was run out to the respective stations, ready to provide lighting for later.

"The site was then tidied up, with everything that could be stored undercover put in a trailer or a tent. We descended the hill to the pub. Some of our members were already sitting outside, having booked into the pub for their accommodation. Beer flowed and food was eaten. Later, those staying on the hill headed back to site. Some were dropped at the bottom and walked to the summit, while others were driven to the top. All were greeted by a scene of devastation, inflicted by the young bullocks residing in the field. They had decided that our camp was far more interesting than the rest of the fields around and had come to take a closer look. When they were finally chased away we could see some of the damage they had caused. The ridge tent was the first thing we noticed. It was lying flat on the ground, a pole broken and hoof prints all over the canvas. G8GDZ's new folding bed (**Photo 2**), which was only delivered the week of the contest, was damaged beyond use. The toilet tent and toilet were damaged, three cars were scratched and a number of the accommodation tents were damaged.

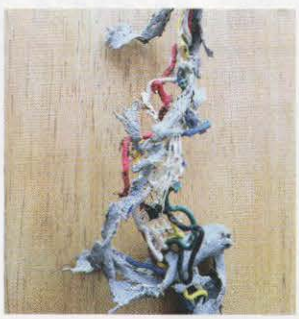

PHOTO 3: Why you should never ask a cow to terminate a cable.

"You have to wonder how, but the cattle entered the 70cm station, despite the tent being zipped up. Once inside they rearranged the boxes, but luckily they didn't damage any equipment. Outside they had pushed over one of the masts, bending two of the ½-in steel pegs holding the tripod down. Luckily all equipment mounted on the mast had been removed. One good thing was that before leaving site we had put the new and assembled 70cm 24-ele InnovAntenna on the roof of the trailer. If we had left it on the ground I think it would have been trampled on. Suffice to say there was not a lot of cheer in the camp that night. Temporary repairs were made so people could go to sleep, equipment and boxes were re-stowed and people went off to bed.

"They say breakfast is the most important meal of the day, especially if you have a lot of work to do. Before we could have ours we had more repairs to do and a site to clean. We went offsite for breakfast. On our way back we received a phone call from Ian, G8IFT, who on arriving back on site had continued assembling the 6m and 4m stations. Ian's call was to ask if we had seen the damage to the rotator cable (**Photo 3**). Luckily we had a spare choc block in our tool kit, to effect a repair.

"Overall, from a competition point of view, we were pretty lucky. There had been very little damage to the equipment, but there would be talk about the personal cost of the damage for years to come and I'm guessing it will put some people off coming out on field days in the future.

"The 6m, 4m and 23cm stations went together quite quickly, but the 70cm station lagged due to the inexperience of those carrying out assembly. Final tests and adjustments were made to the stations before going live at 15:00. The 23cm station missed a number of contacts during Saturday, due to issues with the internet connection, we didn't benefit from any Sporadic-E, but we did experience some aurora. Contacts were up on all bands compared to last year, but unfortunately they were also up for everybody else.

"The 6m antenna came down at the end of Saturday and in preparation for Sunday the 4m antenna went up. The 6m station was reorganised and the transverter inserted into the RF path. During this station change there was an issue with our Icom IC-756, which blew a fuse. For those who have had to replace a fuse in an Icom radio, you will know they haven't made the job easy. Luckily the fuse was changed, ready for the band change on Sunday, but during Sunday we experienced problems in the 4m station with power dropping off. We put this down to the transverter and blamed it on overheating. On 23cm we saw an intermittent SWR issue, which was later isolated to a failed joint on the dipole.

"The contest finished at 15:00 and the task of taking everything apart and packing it up into the trailers for the trip home commenced. The effort in 2013 seemed

RSGB HF Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Jul 7	80m Club Championships	1900-2030	CW	3.5	RST + SN
Jul 16	80m Club Championships	1900-2030	SSB	3.5	RS + SN
Jul 20	Low Power Contest	0900-1600	CW	3.5-7	RST + SN + power
Jul 24	80m Club Championships	1900-2030	Data	3.5	RST + SN
Jul 26-27	IOTA	1200-1200	CW/SSB	3.5-28	RS(T) + SN + IOTA ref

RSGB VHF Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange
Jul 1	144MHz UKAC	1900-2130	All	144	RS(T) + SN + Locator
Jul 5-6	VHF NFD	1400-1400	All	50-1296	RS(T) + SN + Locator
Jul 6	144MHz Backpackers #3	1100-1500	All	144	RS(T) + SN + Locator
Jul 8	432MHz UKAC	1900-2130	All	432	RS(T) + SN + Locator
Jul 15	UHF UKAC	1900-2130	All	1.3	RS(T) + SN + Locator
Jul 20	70MHz Trophy +	1000-1600	All	70	RS(T) + SN + Locator + Postcode
Jul 22	SHF UKAC	1900-2230	All	2.3G & up	RS(T) + SN + Locator (see text)
Jul 22	50MHz UKAC	1900-2130	All	50	RS(T) + SN + Locator
Jul 29	70MHz UKAC	1900-2130	All	70	RS(T) + SN + Locator

Best of the Rest Events

Date	Event	Times (UTC)	Mode(s)	Band(s)	Exchange (info)
May 3 - Aug 3	UKSMG Summer Marathon	All	All	50	None
Jul 12-13	IARU HF Championship	1200-1200	CW, SSB	1.8-28	RS(T) + ITU zone (UK=27)
Jul 20	UKuG 24-248GHz	0900-1700	All	24-248G	RS(T) + SN + Locator
Jul 27	UKuG 5.7-24GHz	0600-1800	All	5.7-24G	RS(T) + SN + Locator

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

greater than usual and was made worse by the heat, which had tired the troops out."

So how did SBRS fare in VHF NFD 2013? The answer is, not surprisingly, not quite as well as the year before. On 6m they came 3rd, on 4m they came 6th, on 70cm they came 2nd and on 23cm they came 3rd.

G7RPP sums it up with the words "Amateur radio is all about learning and we learned quite a few things on this outing." I imagine that primarily means taking an electric fence this year.

THIS MONTH'S EVENTS. July sees the final skirmishes in the 80m Club Championship series for the year, and with Norfolk's move from the Local to National category the results table looks rather different from 2013. The CW session is on Monday 7th and the SSB session on Wednesday 16th. The Low Power (80/40m) Contest on Sunday 20th is the only RSGB contest with a lunch break. For the best results, those in the 3-watt category in particular will need extremely efficient antennas. And everyone will need a good pair of ears and good receive filtering, to pick *really* weak stations out of the noise. The final session of the 80m Club Championships is datamodes on Thursday 24th. The last RSGB HF contest of the month is Islands on the Air (see **Photo 4**). Yet another record was set last year, with over 2500 entries (plus check logs). If you live on an island, which everyone in the UK does, expect to be in demand for contacts. The IOTA Reference is part of the exchange, the one for mainland Britain being EU-005 and mainland Ireland being EU-115. Offshore islands have different references. All the European references can be found at www.rsgbiota.org/info/directory/EU.pdf

PHOTO 4: Members of the MU0HTJ IOTA team, the so-called Ham Test Jimmies: Iain, M0PCB; Chloe, M0GEJ; Paul, M0TZO; Louis, 2U0FER; Tom, 2U0TKB; Mark, M0MJH; Dan, M0TCB and Steve, M0SPF. Front centre; Colin, MU0FAL.

VHF wise, the 2m UKAC on Tuesday 1st is followed by VHF NFD on the weekend of 5-6th. The third in this year's series of five 2m Cumulatives coincides with the final three hours of VHF NFD, then continues for one more hour. After that it's back to the UKACs, with 70cm on the 8th and 23cm on the 15th. The 70MHz Trophy Contest runs for six hours on Sunday 20th. The first two letters of your postcode are part of the exchange in this one. Anyone who lives in a single letter postcode area (eg 'S' for Sheffield) should note that single letter codes are padded-out, to make them all two letters. A full list of postcodes is available online at www.rsgbcc.org/vhf/rules/10rules/postcode.htm

Two days later, on Tuesday 22nd, we have the SHF UKAC session. A couple of months ago the SHF UKACs were transferred to Sunday evenings, to avoid interference to the Primary User, but participant reaction was unfavourable so they have been changed back to the traditional 4th Tuesday of the month, but with the 13cm element offset. This month 9cm, 6cm and 3cm take place at the familiar time of 1900-2130UTC, while 13cm will be at 2030-2230. This later start and end time for 13cm only applies to May-July, so next month the timing will revert to the norm. The 6m UKAC is also on Tuesday 22nd and, because there are five Tuesdays this month, there is also a 4m UKAC session on the 29th.

The UK Six Metre Group's Summer Marathon continues all this month. I would have mentioned it previously, but I only learned of it recently. Next year I'll give a bit of a build up, before it starts. The IARU HF Championships are on 12-13th. As in previous years a UK HQ will be operational, but previous experience of piling huge amounts of effort into trying to be the winning HQ station has proved that the UK is not best placed to do so. Also, there are insufficient top-notch contesting stations in the UK, and not all of those that exist are available to the team. And whilst the UK HQ team were extremely grateful for the support they get from the UK amateur community, it never matches up to the support that the citizens of some other nations give their teams. Consequently this year the effort will be scaled back a bit... Later in the month there are two events from UKuG. On Sunday 20th the bands will be 24-248GHz, while on the 27th the bands will be 5.7-24GHz.

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Bob Titterington, G3ORY • e-mail: ardf.chairman@rsgb.org.uk

ARDF

2014 British ARDF championships

YOUR RSGB
ARDF: DEDICATED TO DF HUNTING

Kentaro, JL4NDN, pictured during the 144MHz competition. He had flown in from Tokyo solely to experience some European ARDF.

WEEKEND OF ARDF. The Championships took place in the Midlands over a long weekend in May.

First was a Sprint event on the Friday evening. This was the first British Championship to have the full complement of 12 transmitters deployed. The aim was to locate the ten hidden transmitters plus the two beacons, whose locations were marked on the map, within a time limit of 60 minutes. This rule applied to competitors of all ages and whilst the competent younger ones might reasonably be expected to find all transmitters inside the time, the older ones had to keep an eye on the clock to make sure they got back inside the time and were not relegated to the bottom of the results table.

The Sprint competition is seriously exciting as punching the start timing box allows one to turn on the receiver to hear the first of the 12 second transmissions from each of the first five hidden transmitters. Sorting out which one to head for initially is a bit of a nightmare but important to get right. Chasing down one of the close transmitters allows time to get an idea of the direction and range of the remaining four. Once these are in the bag, it was back to the road, punch the spectator beacon and then cross to the opposite side of the road to repeat the process on the remaining five hidden transmitters, then the final beacon and finish. Fastest competitor was Alexander Hergert of Germany who 'bagged' all 12 transmitters in 31.5 minutes. It has to be said that he is a past medallist in his class (M21) at world level. Fastest Brit was David Williams in just over 36 minutes.

Andrew, G4KWQ caught in 'full flight' during his outstanding 2m run

RSGB President, John Gould, G3WKL, presents the 144MHz salver to Andrew, G4KWQ as he becomes British Champion on this band.

OVERSEA VISITORS. There were fewer than usual overseas visitors to the Championships this year but one highlight was Kentaro, JL4NDN, who flew in from Tokyo for three nights, so that he could take part in two of the three Championship events. It did give us an opportunity to gain a better insight into ARDF activity in Japan, which is much more of a young person's activity than it is here.

DAY 2. Onthe second day, the event moved to Postensplain in the Wyre Forest where planner David Williams used the deep eroded stream valleys to good advantage in setting a 'classic' course with five hidden transmitters using the 2m band. There was wide variation in the sequence that competitors chose to visit the hidden stations and for some a feeling of regret afterwards, when hindsight showed a rather better order. Such is the success of good course planning.

Jillian, M0JIN 'legs' it away from the start as she sets out on one of her best performances to date in the 2m competition.

Two RSGB competitors had really good runs. First was Andrew, G4KWQ who chose to visit the 5 transmitters in the same sequence as Alexander Hergert and Andrew came out ten minutes faster than the German runner. Andrew's time of 49 minutes for the 5.6km course with five transmitters over this terrain was outstanding.

The other competitor who had a great day was Jillian, M0JIN who not only took the W50 honours over her 4 transmitter course, ahead of the German Anke Ebert, but also posted a better time than all the competitors in M70 and M60. The latter was a bit of a blow to male morale!

DAY 3. Day 3 took us to the open spaces and holly plantations of Sutton Park north of Birmingham. The accurate bearings obtainable on 3.5MHz, coupled with the absence of multi-path propagation, indicated some fast times were likely. Recommended IARU distances were used for the age classes, but the leading competitors were coming back in under the hour. Alexander Hergert led the charge in 50.10 minutes, but there were four other competitors also under the 60 minute mark (older competitors do not have to hunt all five transmitters in order to 'level the playing field'). First Brit home was Vlad, 2E0VLB who, having had a disappointing Day 2, had really 'turned on the taps' to power round Sutton Park in 57 minutes in the M60 category.

We were delighted to welcome the RSGB President, John Gould, G3WKL, who was on his first 'official engagement'. He had kindly agreed to come to present the certificates, prizes and trophies. Michael, M6MDD took John and his wife out into the area to sample a little of ARDF competition on a stroll out to the nearest of the day's hidden transmitters. Following that, John met some of the competitors from overseas and finally made the presentations.

Full results and all split times are available on the RSGB main website. Click the Radio Sport tab and select ARDF.

Forthcoming ARDF Events

6 July: Bentley Woods near Atherstone, Warwickshire
10 August: Hodgemoor Wood near Beaconsfield

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Stephen Warrillow, M0CYT/VK3SN • e-mail: swarrillow@hotmail.com

Winter QRP in the Australian Alps

Taking on the wilderness in search of radio contacts

After the blizzard that made the radio outing even tougher than usual.

REMOTE OPERATING. As Australia's smallest mainland state, Victoria is roughly the size of Great Britain, but has less than one tenth its population. In the north-east of the state, the Australian Alps stretch for several hundred miles into southern New South Wales and contain all of the nation's highest peaks, including Mt Kosciuszko that sits at 7310 feet.

Every winter, heavy falls of snow cover areas higher than 4000 feet and the mountains take on a remote and austere icy beauty. Victoria's ski fields are popular destinations for snow sports, but a few adventurers head out beyond civilization and explore the remote back country where unspoiled natural wilderness can still be experienced. Every August, a team of amateurs heads off to spend a week traversing some of Victoria's highest peaks across the Bogong High Plains, taking QRP gear to maintain contact and work from the roof of Australia. While this endeavour is a real test of organisation, fitness, equipment and self-reliance, it is also an amazing experience that goes beyond the everyday routine.

PREPARATION. Our work of preparing for a backcountry ski trip begins weeks in advance. All gear needs to be thoroughly checked as its reliable performance can prove crucial when out on the trip. Because literally every bit of kit needs to be carried, weight is a major consideration. The list of gear to be taken has developed over many years and contains things you may not realise – such as sunscreen and sunglasses to go with the polar fleece and GORE-TEX®. With careful preparation, it is possible to head away for up to four nights with around 14-20kg packed weight.

Cross-country ski gear is much lighter than downhill equipment. The heel moves freely and the skier is able to head uphill, downhill and traverse almost any snow-covered terrain. All-weather clothing consists of GORE-TEX® and similar breathable yet waterproof modern synthetics, as well as goose down to provide warmth. Winter-rated down sleeping bags (down to at least -10°C) are essential. Food needs careful consideration in order to provide high levels of energy plus nutrition in a dense, weight-effective form. A full day skiing carrying a load of gear consumes some serious calories and all of the usual modern dietary recommendations can be pushed aside. We dehydrate many meals to keep weight down and eat a lot of pasta, chocolate, dried fruit, salami, flat bread and nuts. A good port or decent whiskey is very nice to sip before turning each evening too!

RADIO GEAR. Our QRP setup includes an Elecraft KX3 and a full-sized 80m dipole (made of strong hook-up wire) fed by RG-174 mini coax through a toroid-choke balun (made of 10 turns of RG-174 on a FT114-43 core) [1]. The KX3 is a remarkable QRP transceiver [2], with performance features comparable to many home-station rigs. We power the radio with lithium-ion batteries [3] that are a major advance on sealed lead-acid batteries in both weight and capacity. They are charged via folding 20W solar panels [4]. For liaison within the group, we use hand-held radios on 2m. The high elevation provides excellent line of sight opportunities for APRS and even very distant repeaters. All the antennas, transmission lines, baluns and charging equipment are homebrew.

Operating once set up in the mountain cabin.

STORMY WEATHER. The 2013 winter trip took place in the first week of August, with three of us departing Melbourne at 5am for the five-hour drive to the ski resort of Falls Creek. On arriving in the mountains, it was clear that the weather might be challenging. We left the four-wheel drive in the long-term car park and headed up the Bogong High Plains Road with two feet of snow under the skis. Between us, we carried enough gear to stay out in the wilderness for four days. After a while, we struck out beyond the groomed trails and headed across virgin snow plains. Several hours later we reached the point where we needed to decide on whether to head down to the protection of a sheltered valley and make camp, or climb higher and over the third highest peak in the state and before descending to safety on the other side of the range. This was a big decision, as once we set out turning back would be rather difficult. As it happened, the wind dropped, it stopped snowing and we committed ourselves to going over the top. This turned out to be a mistake...

For the next five hours, we came to regret deciding to press on. About halfway up the mountain, the wind picked up with a vengeance. The steep sides of the range were covered in treacherous sheets of glassy, rippled ice on which we slipped and stumbled. Strong wind gusted up to 70 miles per hour and blew sleety snow sideways. Visibility dropped to the point where it was impossible to discern ground from sky, let

alone picking the way ahead. With GPS navigation and liaising on 2m to keep together, we struggled forward, now painfully aware that turning around to head back down the mountain was not a good option either.

At one point, skiing itself became impossible and we were reduced to strapping the planks on to our packs and walking. I clumsily dropped one of my skis during this change-over and had to make a desperate face-plant lunge as it slid away at great speed towards a deep ravine. Grimly, we pressed on and finally reached the summit. The view from this point is stunning on a clear day, but it was no place to pause as the wind was now fully gale force. The way ahead snaked across several high ridges for about 5 miles before dropping down into the relative shelter of gully below the tree line. Every so often, a break in the snowy whiteout would allow glimpses of the way ahead and we eventually picked up the top of a large bowl from which an alpine creek ran down towards our final destination. It was with considerable relief that we began to descend into low forest and out of the wind. After another mile or so, we found our destination: a beautifully restored mountain hut nestled into the gully amongst a stand of mature snow-gums. Mountain huts are remnants of an era when cattlemen formerly grazed stock on the high plains during each summer. These are incredibly simple structures made of rough-cut local timber and furnished only with wooden benches. In winter, they are an absolute haven. Despite our fatigue, we quickly set about lighting a fire in the potbelly stove for warmth and cooking.

An icy antenna being set up by M0CYT.

ON THE AIR. After a few hours spent foraging for firewood and cooking a hot meal, it was time to get on the air. Setting up a full size 80m dipole in heavy snow and bad weather is not so easy, but over the course of 30 minutes or so it was strung up as an inverted-V by throwing fishing line threaded through snow balls into suitable trees. What was really tricky was getting the mini coax feed line back into the hut, but by using a springy green stick we managed to pass it inside through a narrow gap under the roof. Once the battery and rig were connected we tuned up on 40m and were immediately able to make several contacts. With practically no noise, it was easy to hear lots of distant stations and our 5W on SSB worked extremely well. We also undertook the important task of letting family back in Melbourne that we were alive and well. Mobile phones have no coverage up in this region, so HF was our only link with the outside world. For the rest of the evening we stayed warm and cosy in the security of the hut, enjoying dark chocolate, whiskey and working plenty of stations on 80m while the blizzard howled outside.

The next day promised better weather. While the wind remained strong, sunny breaks shone through for extended period and snow flurries were brief. Down in the valleys heavy rain was falling and several mountain roads were closed. As a result, other members of our team who were hoping to join us made contact on 40m to advise it was impossible for them to journey up to the high plains. While this was disappointing news, it took away any need to make an early move from our present location. We took our time preparing to leave and waited patiently for the weather to improve. Around midday, we headed out from the hut and back around the main range. The wind was now at our backs and there were several stretches of flat terrain where it was possible to get a free ride for a mile or so by holding an open jacket as a sail. Views across the mountains were spectacular, with snow-capped peaks visible all the way to New South Wales. It was easy to navigate down a narrow spur and find a sheltered snow meadow. Protected by the massive bulk of Mt Nelse, this was a beautiful location to make camp. Before too long, we were settled in and had the dipole strung up in adjacent trees. It was also a good opportunity to set up the solar panels and put some charge back into the lithium batteries. Over the course of the afternoon we worked both 20m and 40m and also spent a bit of time exploring our immediate surrounds. By sunset we were happy to have dinner, climb into sleeping bags and work 80m until late.

Our third day was spectacular. Several stations had provided weather updates and these proved to accurately predict a clear and sunny day. We decided to leave camp set up and make a 10-mile tour across the high plains with daypacks. Carrying just lunch and a few other essentials, we headed out. Our journey took us across frozen streams, over deep ravines and finally onto a wide plateau. From here we managed to utilise APRS [5] as we swept down once again below the tree line for lunch in an igloo built by a previous group of backcountry skiers. During the afternoon ski back, we spotted a bank of dark clouds rapidly advancing. As we arrived at camp, the wind had entirely disappeared, but heavy snow was falling. This continued into the night with and apart from the crackle and hiss of HF static with contacts on 80 and 160m, we were enveloped by a profound silence.

Our final day was marked by a deep blanket of powdery snow. Nearly 30 inches had fallen during the night and not a single footprint or ski trail was evident. We pulled down the antenna and packed away our gear. It was worth investing a little time re-waxing our ski bases to prevent fresh snow sticking and impeding progress. Climbing back up to the high plains, we turned back to Falls Creek and began the descent down to our vehicle. The sounds of civilisation were rather jarring as when we made it back to the resort, but it was time to depart. Aside from needing to clear away a lot of snow from the four-wheel drive we made a rapid exit from the mountains and started the trip home.

It had been a great trip. The weather was certainly more challenging than on previous adventures, but we'd had a fantastic time with excellent snow conditions. All our gear had worked well and the radio set up had done a terrific job. We'd made very good numbers of contacts and appreciated the security of a reliable link with the outside world during our mini-expedition. As always, there is a lot to learn on each trip and much of the discussion during the long drive home was about planning for next winter. It's never too early to start!

[1] www.n5ese.com/balun_1-1.htm
[2] www.elecraft.com/KX3/kx3.htm
[3] www.powerstream.com/PST-MP3500.htm
[4] www.powerfilmsolar.com/products/?f161200&show=product&productID=271509&productCategoryIDs=6578,6579
[5] http://aprs.fi/#!ts=1375747200&te=1375833600&call=a%2FVK3SN-7

M0CYT currently spends most of his time in Australia where he is licensed as VK3SN. He is a member of both the RSGB and the WIA. His radio interests focus on operating portable from remote locations. For additional details on winter as well as summer wilderness activities in VK, visit www.vk3sn.net

RadCom

HF F-Layer Propagation Predictions for July 2014

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	77	74.....3688	87.322.37888	.47777777884	..677776886.	.....66..	.....	.....
*** Asia								
Yakutsk	.....	.....	3.....24444	7.4676677777	...4755.....	.....	.....	.....
Tokyo	.....	.....	.....	.....	.....	.....	.....	.....
Singapore	.....22.	.....788.	.....665.	.....65..	.....65..	.....4...	.....	.....
Hyderabad	.....	255	2666	5665	.....44..	.....	.....	.....
Tel Aviv	8.....899	98.....7999	66.....26887	...3...3675.	.....66..	.....	.....	.....
*** Oceania								
Wellington	.....	.....	.....	.....	.....	.....	.....	.....
Well (ZL) (LP)	.....	56.....6..	56.....3.	54.....54	.....	.....	55	.....
Perth	.....	.....2..	.....35.5	4	.....	.....	.....	.....
Sydney	.....	.....37..	.....67..	.....34..	.....	.....	.....	.....
Melbourne (LP)	.....	.99.....	8998.....7	9998.....59	878.....79	7.....68	7	.....
Honolulu	.....	.....	.....	.....	....4.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....	.....	.....	.....	.....
W. Samoa	.....	.....	.....	.....	...4544....	.....	.....	.....
*** Africa								
Mauritius	2.....22	6.....5887	8887	.....3887.	.....5...	.....	.....	.....
Johanesburg	.....	.....23.	.....775.	.....73..	.....6...	.....	.....	.....
Ibadan	1.....1	65.....556	772.....2777	467.....7777	..76...3775.	...7....75..	.....6...	.....
Nairobi	3.....33	8.....888	62.....2666	.5.....6666	.....5666.	.....4666..	.....4...	.....
Canary Isles	65.....266	886.....788	8873....6888	8784....8888	7.7988899998	...888889987	.....56..	.....
*** S. America								
Buenos Aires	.....	652.....3	888.....78	767.....78	466	.....45.	.....	.....
Rio de Janeiro	.....	66.....6	986.....89	76.....788	4.....776	664	.....5..	.....
Lima	.....	652.....2	888.....58	7565.....78	.....	.....	.....	.....
Caracas	.....	33.....3	8872.....68	86872....488	4..5643.5688	.....4.4775	.....	.....
*** N. America								
Guatemala	.....	33.....	887.....7	755.....7	45	.....	.....	.....
New Orleans	.....	65.....	775.....5	744.....46	.....	.....	.....	.....
Washington	2.....	662.....3	8872.....37	853.3....477	.....3...563	.....	.....	.....
Quebec	5.....	76.....7	774.....68	35676	.....	.....	.....	.....
Anchorage	.....	.....	33.....3	766555566667	6.6545666777	.....6.	.....	.....
Vancouver	.....	.....	.....	.....	.....45.	.....	.....	.....
San Francisco	.....	.....	.....	.....	.....	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....	.....	.....	.....

Key: Each number in the table represents the expected circuit reliability, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low 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 July, August & September 2014 are respectively (SIDC classical method – Waldmeier's standard) 82, 81 & 80 and (combined method) 78, 78 & 78. The provisional mean sunspot number for May was 75.2. The daily maximum / minimum numbers were 111 on 14 May and 32 on 14 May.

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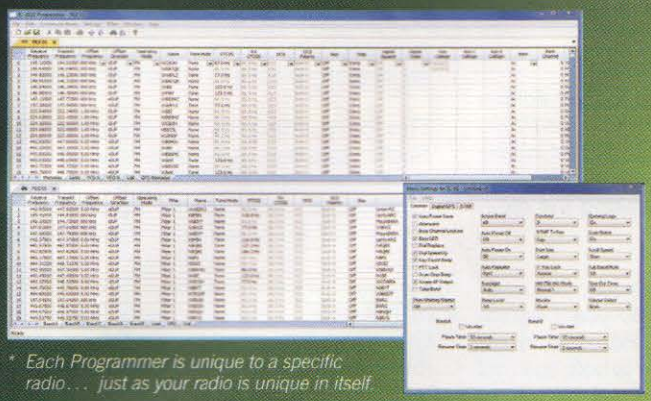

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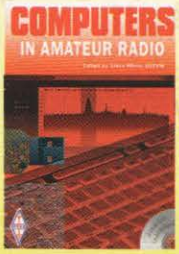

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Edited by Steve White, G3ZVW

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By Roger Cooke, G3LDI

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By Clive Smith, GM4FZH

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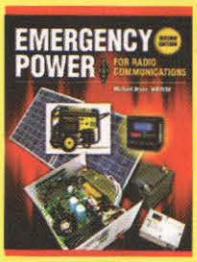

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By Michael Bryce, WB8VGE

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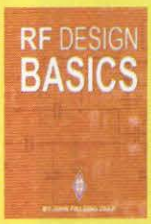

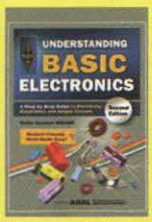

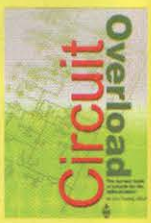

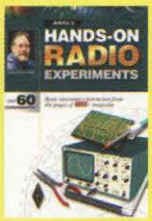

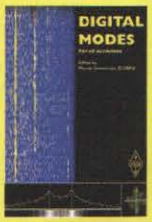

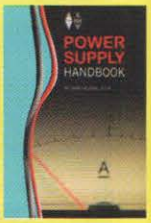

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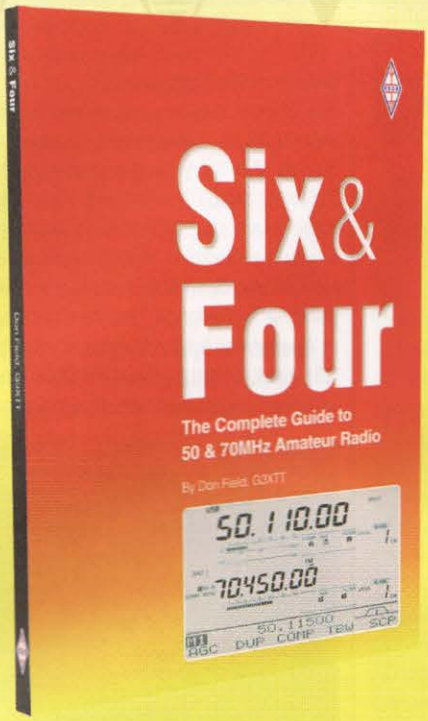

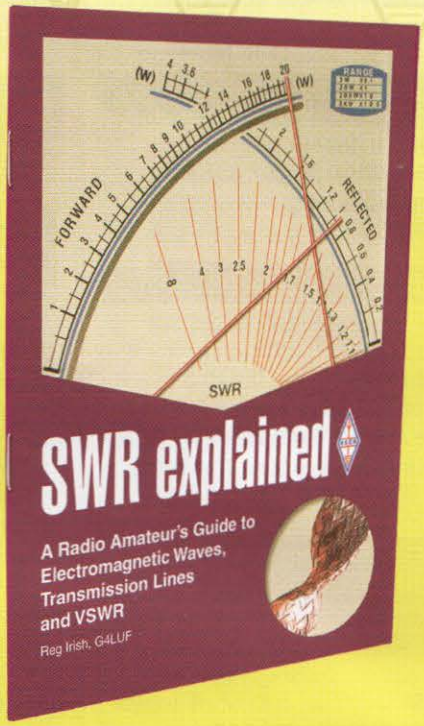

Six & Four

The Complete Guide to 50 & 70MHz Amateur Radio

By Don Field, G3XTT

Six Metres (50MHz) – the 'Magic Band' – has always been 'different'. It sometimes behaves as an HF band, with world-wide propagation, but at other times acts more like a VHF band, enjoying the benefits of Sporadic - E, meteor scatter and other occasional propagation modes. Because it has so many facets, 6m is both a challenge and an enigma and it draws amateurs from both the VHF and HF worlds. *Six & Four* is the complete guide to this fascinating band and the similar Four Metre (70MHz) band.

Six & Four is based on the hugely popular 6 Metre Handbook, which is credited by some with doing much to popularise the 50MHz band. This book has moved on and is intended as a handbook for both the 6m and 4m bands. It includes a host of new material on the 4m band and the 6m material has been extensively rewritten to bring it fully up to date. There are details of the new equipment that has become available, especially by way of software-defined radios. There have also been some significant advances made in antenna design and EME ('moonbounce') activity has increased. There are new challenges, made possible by technological developments such as the WSJT and capabilities for remote operation have come on apace. And there are many ways to stay abreast of band openings and activity, through smart phones and other technologies.

Six & Four is essential reading for all radio amateurs, especially those who want to try something new and different. There's something for everyone, from the beginner who has never been on 6m or 4m, to those who might already have 200+ countries confirmed on 6m! Both bands are a lot of fun, as this book shows!

Size 210x297mm, 288pages,
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SWR Explained

A Radio Amateurs' Guide to Electromagnetic Waves, Transmission Lines and VSWR

By Reg Irish G4LUF

Many radio amateurs are familiar with the concept of the Standing Wave Ratio (SWR) and the effect it has on the transmission and reception of signals. Few however understand much about it beyond the adjustment of an antenna tuning unit to the reduce SWR. *SWR Explained* sets out to fill that gap and provide the context that makes electromagnetic Waves, transmission Lines and VSWR comprehensible.

Written by leading electrical engineer Reg Irish G4LUF *SWR Explained* sets out by explaining what waves are, how they move in free space and how guided waves react. Steering clear of great chunks of heavy mathematical theory the author brings your personal experience to bear so that the reader gets a practical feel for the topic. How transmission lines react is explained along with matching and even using transmission lines as resonant circuit elements. There are designs for measurement of transmission lines and a practical guide to the working of a VSWR meter.

SWR Explained provides a guide to the mysteries of electromagnetic waves, transmission Lines and VSWR yet is light on heavy mathematics. If you want more information about understanding this fascinating topic this book is recommended reading.

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REGIONAL MANAGER: JASON, O'NEILL, GM7VSB, RM1@RSGB.ORG.UK

Border ARS
Alex, GM8BDX, 01890 830 607
11 Club meeting
Cockenzie & Port Seton ARC
Bob, GM4UYZ, 01875 811 723
5-6 VHF Field Day
16 On the air
26-27 RSGB IOTA Contest from Tiree
Kilmarnock & Loudoun ARC
Graham, MM3GDC,
mm3gdc@btinternet.com
1, 15, 29 Construction/education night 7-10.30pm
3, 10, 17, 24 Construction
6, 13, 20, 27 Sunday club 9am-1pm
8, 22 Club night 7pm
Livingston & DARS
Norman, GM1CNH, 07740 946 192
1, 8, 15, 22, 29 Morse, Foundation & Intermediate training plus operating
Lothians RS
Alan, GM3PSP, 0131 623 4580
9, 23 Pub night
Stirling & DARS
John McGowan, gm0fsv@gm6nx.com
3, 10, 17, 24, 31 Weekly club meeting
6, 13, 20, 27 Construction, training, projects and operating, from 10am
Wigtownshire ARC
Ellis, GM0HPK, www.gm4riv.org
5-6 GB4JPJ celebrating birthday & place of John Paul Jones at DG2 8BQ
10 Radio activity night
17 Lighthouse activations, Davy, MM0LGR

REGION 2: SCOTLAND NORTH & NORTHERN ISLES

REGIONAL MANAGER: BERNIE MACINTOSH, GM4WZG, RM2@RSGB.ORG.UK

REGION 3: NORTH WEST

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

Chester & DRS
Bruce, M0CVP, 01244 343 825
1 Operating night and 2m contest
8 Committee meeting
15 Digital mobile radio, Andy Griffiths
22 Electricity generation and supply, Dave, G4JMF
29 Pie & pint night at Shrewsbury Arms
20 GX7WAB WAB activation, Anglezarke view point
South Manchester R&CC
Ron, G3SVW, 01619 693 999
3 DVD: *True Glory*
10 Antenna clinic, Ron, G3SVW
17 On the air
24 Peruvian cuisine, Dave, G4UGM
28 Technical forum
31 Club projects – past, present and future
Thornton Cleveleys ARS
John, G4FRK, 01253 862 810
5 5th 6th VHF/NFD
7 How did we do?
14 Visit to the Coast Watch Station on Rossall Point, 6.30pm
21 Construction & fault finding
28 Foxhunt
Warrington ARC
Ken, G3VBA, 01928 733 234
1 Multitasking with Arduino, Terry, G6CRF
3, 10, 17, 24, 31 Grumpy club, 10am
6, 13, 20, 27 Solder Sunday, 12 noon
8 GB2RS news service, Ken, G3VBA
15 A look at encryption, Dave, G8KBB
22 Barbecue, Hazel, G6XKK
Workington & DARC
Alex, G7KSE, mx0wrc@gmail.com
7 Homebrew evening

On 3 August 2014, the nation will commemorate the beginning of World War 1 known as 'The Great War' and on 4 August a European commemoration will take place in Mons, Belgium. To commemorate this event, two amateur radio stations will be activated in the 'old' county of Cheshire.

The first station will be located at Leasowe Lighthouse near Morton Wirral and will be on the air from 25 July until 7 August with the callsign GB100GW. The second station will be located at Cheshire Military Museum in the city of Chester from 1 to 7 August with the callsign GB100CMM.

The station on Wirral is sponsored by **Wirral & DARC** and hosted by the Friends of Leasowe Lighthouse Amateur Radio Station, M0MTC. The callsign M0MTC will also be used during busy periods at the lighthouse.

The Chester station is sponsored by **Chester and DARS**. It is also hoped to put on a small display of military radio equipment. Major T E Pickering MBE (Curator) with the aid of Melanie Kane (Marketing Officer) have made it possible to use the Cheshire Military Museum as a venue. He has also been able to supply a copy of the painting 1st Battalion The Cheshire Regiment at Audregnies by David Rowland for the official QSL card, which is copyright Cheshire Military Museum and shown here by kind permission.

REGION 4: NORTH EAST

REGIONAL MANAGER: NIGEL FERGUSON, G0BPK, RM4@RSGB.ORG.UK

Denby Dale RC
Richard, M0RBG, 07976 220 126
2 GB0TDF from Cartworth Moor for Tour de France (no meeting at Pie Hall)
3-9 GB0TDF for Tour de France
7 80m CC CW
9, 23 Club net 145.575MHz, 7.30pm
13 G6LD from Cartworth Moor 1000-1400 for WAB 144MHz Low Power
16 80m CC SSB from Pie Hall plus noggin & natter night
24 80m CC data
30 Real Ale Night, 8pm, Star Inn, HD1 3PJ
Hornsea ARC
Gordon, G3WOV, 01377 240 573
2 Yellowstone National Park, 2E0OZE
9 Mystery of numbers, G0AZQ
14 G3GBH Cup Quiz (SARS)
16 Club night
23 Club barbecue
26-27 IOTA Contest
30 0.0 recurring 1, G0TPS
Mexborough & DARS
Darrell, G0FUO, 07887 423 221
4, 11 VHF National Field Day prep
18 Final prep for Yorkshire Belle Radio Event
19 Operating /MM for Yorkshire Belle Radio Event
25 Data mode demonstration
Ripon & DARS
David, G3UNA, 01423 860 778
3, 10, 17, 24, 31 Club Night
31 Poundshop Challenge II

Sheffield & DWS
Krystyna, 2E0KSH, 07884 065 375
2 Practical evening on test equipment
5-6 G5TO/P at Wharncliffe Chase for RSGB VHF National Field Day
16 RSGB 80m Club Contest
26-27 G5TO/P at Wharncliffe Chase for IOTA Contest weekend
30 DF hunt 7-9pm then meet after at University Arms, S3 7HG

Over the weekend of 26 and 27 April, members of **Pontefract and DARS** operated GB1AVR for the Ackworth Vintage Rally Scammell Spectacular. The Saturday started with light rain, so they operated from inside a member's mobile shack, complete with cooking facilities. As the weather improved over the weekend they erected the tent and operated from there on the Sunday. Many contacts were made on VHF and HF bands, using FM, SSB and Morse. Full details are on QRZ.com. The next Ackworth Vintage Rally they will be attending is on 19 and 20 July.
Unless the operators are told in the QSO that the bureau is OK, all UK contacts are QSLed on receipt of a card through the bureau. Other routes are direct to G0BPK, enclosing a SAE for those not in the bureau or electronically by LOTW and eQSL (all contacts automatically). All recent contacts are now in an electronic log and are uploaded to LOTW and eQSL after the events. Due to time considerations, all overseas contacts are QSLed via the bureau after the event.
Other events in the club's calendar at a picnic at the Castle from Pontefract Castle with GB0PH on 12 July and Pontefract Liquorice Festival on 13 July operating GB0PLF, 2m 4m only.

Halifax & DARS offers hearty congratulations to all six candidates for passing their Intermediate exam in May. Pictured left to right are Eric, 2E0JCK, Malcolm, 2E0UGX (at back), Darren, 2E0ZDW (at front), Ray, 2E0KCE, Vicky, 2E0VRD, Sean, 2E0TOD and tutor Anthony, G0WFG. The club is currently running a Foundation course and also hopes to stage an Advanced exam in July.

REGION 5: WEST MIDLANDS

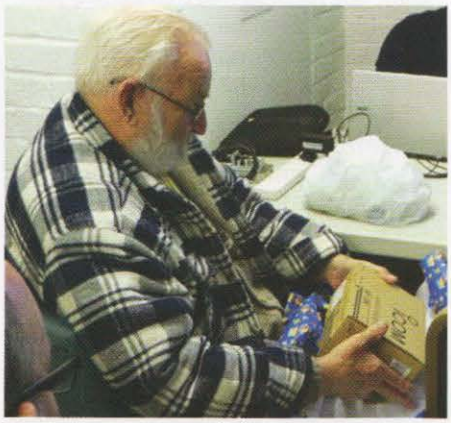
REGIONAL MANAGER: MARTYN VINCENT, G3UKV, RM5@RSGB.ORG.UK

Aldridge & Barr Beacon ARC
Albert, G0KFS, 01922 614 169
7 On the air
21 Talk on sea battles
Central Radio Amateur Circle
Martin, G1TYV, 07906 905 071
1 144MHz UKAC Contest
3, 31 Group meeting
17 Night on the air
19 Barr Beacon
Cheltenham ARA
Derek, G3NKS, 01242 241 099
17 Lunch
19 Auction, SK equipment
Coventry ARS
John, G8SEQ, 07958 777 363
7, 14, 21, 28 Club net, 145.375MHz, 8pm
11 Castles on the Air, Kenilworth Castle
18 3rd round 2m DF Trophy
25 Video night
Gloucester AR&ES
Anne, 2E1GKY, 01242 699 595 daytime
7 DF hunt
14 VHF operating
21 Courtyard books, special visit with Brian, G4CIB & Leta, G4RHK
28 Closed
Malvern Hills RAC
Dave, G4IDF, 01905 351 568
8 Making money on HF, Dave, G4OYX
23 Informal meeting
Midland ARS
Norman, G8BHE, 07808 078 003
2 Open meeting, shack on the air and training classes
9 Committee meeting
16 Summer social planning and shack on the air
23 Rally visits planning
30 Open meeting and shack on the air
Rugby ATS
Steve, G8LYB, 01788 578 940
1 UKAC 144MHz, radio operation and projects
5-6 VHF NFD
8 UKAC 432MHz, radio operation and projects
12 VHF NFD post-mortem, general radio and technical activities
15 UKAC 1296MHz, radio operation and projects
19 A video about vintage electronics, G8CTJ
22 UKAC 50MHz, radio operation & projects
26 Practical project session
29 UKAC 70MHz, radio operation and projects
South Birmingham RS
Gemma, M6GKG,
gemmagordon.m6gkg@gmail.com
1, 8, 15, 22, 29 Coffee Morning in the shack 11am to 1pm all welcome
7, 14 Work in the shack
18, 25 Preparing stock for Telford Hamfest
21, 28 Open meeting and ragchew
Sutton Coldfield ARS
Robert Bird, spirit.guide@hotmail.co.uk
5-6 GB3RSC for National Field Day
7 Open net, 145.250MHz, 7.30pm
12 GB4MVF at Middleton Village Fete
14, 28 Club meeting at Sutton Coldfield Rugby Club from 7.15pm
15 Open net on 70.475MHz
19 GB4FMC for Canals on the Air from Fazeley Mill Marina
28 100 years of WW1
Telford & DARS
John Humphreys, 07824 737 716
2 Committee/GX3ZME OTA HF
5-6 VHF NFD on Long Mynd, IO82NN, 10.30am start
9 3rd 2m DF hunt
16 Hack Green visit, tour including looking at the SDR
23 QSL cards, Paul, M0PNN
30 Kite portable on Little Wenlock Village Hall Field
Wythall Radio Club
Chris, G0EYO, 07710 412 819
1, 8, 15, 22, 29 Morse class, 7.45pm
1 VHF Field Day preparation evening plus 144MHz UKAC Contest, 8.15pm
4, 11, 18, 25 Nibbles night in the shack, 7.30pm
5-6 RSGB VHF National Field Day
6, 13, 20, 27 Club net 145.225MHz, 8pm
6 Comms for Wythall Fun Run, 9am
7 80m Club Championship Contest CW leg; Intermediate exam, 8pm
8 Committee meeting, 8.30pm
13 Club trip to Reading Rally, 8am
15 Centenary talk 3: The Race to Cross the Atlantic, Chris, G7DDN, 8.30pm
16 80m Club Championship Contest - SSB leg, 8pm
22 Free 'n Easy & on the air, 8.30pm
24 80m Club Championship Contest - Data leg, 8pm
28 Curry Night at the Monsoon, 6:30pm
29 Centenary Talk 4: 100 years of Amateur Aerials, Chris, G7DDN, 8.30pm

Telford and DARS have been busy. April saw them with Marconi Day in Tywyn, Mid Wales. Formerly a receive-only station for the Marconi Company for the send-only station near Caernarfon, it worked for just 10 years from 1913-1923. Several members of the club helped with the preparation, set up running and eventual dismantling of the amateur station after the 24 hour period. Across three stations including one that worked 80m and 160m at night using a homebrewed trapped dipole and 17m during the day with a home brew delta loop, 1000 contacts were made in the 24 hour period, with at least one station working the whole time.

Training saw three candidates pass their Foundation Certificate including the club member Andy, M6YVN with thanks to Mike, G3JKX for the tutoring.
May saw a few members of the club working with the newly acquired LFA for 6m working around 65 contacts with the longest DX being 2580km into Greece. 11 countries were worked in all on a weekend that did not seem to show any significant lift.

Members of **Wythall Radio Club** had more reasons to celebrate recently. This time it was to commemorate the 80th birthday of one of their long-standing and popular members. Jim, 2E0BLP reached that milestone in May. Often to be heard on air across Birmingham, Jim has a very distinctive voice and with his broad 'brummie' accent. He was a very active CBer many years ago; on becoming disillusioned with the behaviour he migrated to the amateur bands where he found a home (and more friends) at Wythall Radio Club.
A grand party was held and Jim was presented with an Icom ID-31E D-Star handheld, bought for him from Martin Lynch & Sons by all club members.



The birth date of Tony Hancock was 12 May 1924 and he would have been 90 this year. To celebrate this, Coventry ARS set up GB8TH at his birthplace of 41 Southam Road, Birmingham. Like him or loathe him for sending up the hobby, at least we get a mention. It was revealed that one of the writers lived next door to an amateur who was a dentist and he could hear the exchanges about the weather even at 2 o'clock in the morning.
The invasion of Southam Road was planned, much to the bemusement of the owners of the house whose permission they had. The local residents joined in, one in character as Tony's The Rebel character. Many a pile up was had on 2 and 40 metres during the day. There was a live BBC TV news feed at lunchtime with a much longer repeat on the evening BBC Midlands news. On the day we they visited by Alan Florence, G7CDK who was the recording engineer for the Radio Ham & Blood Donor vinyl, now available on CD.
People who came to speak with us went away with RSGB and club information. This was just what a special event station is about, promoting the hobby.
The bread pudding, an essential ingredient of the Radio Ham sketch, was supplied by Greggs.
Trevor, G0NMC has kindly up loaded the BBC news feed to YouTube on http://youtu.be/7cWBwTGze2w

REGION 6: NORTH WALES

REGIONAL MANAGER: LIZ CABBAN, GW0ETU, RM6@RSGB.ORG.UK

North Wales RS
Liz Cabban,
lizcabban@vodafoneemail.co.uk
3 General meeting
10 Technical topics
17 Natter night
24 DIY satellites & amateur radio talk by Jo Hinchliffe
31 Outdoor radio activities

Four RAF cadets from 2364 Squadron at Welshpool have recently gained their Radio Communicator badge – only 8 have been awarded in the No 2 Welsh Wing that covers Mid and North Wales. To gain this badge, cadets have to pass six modules from a list of 10 subjects ranging from the amateur radio Foundation licence to HF military Comms and the Certificate to IT to computer data comms, to list but a few.
Well done to Cdt Doree, MW6WCD, Cdt Shanahan, MW6CYX, Cdt Matthews and Cdt Glover, MW6DLG. Keep up the good work.

DEADLINES

The next deadlines for entries in *RadCom* are 24 June and 21 July. Get your news stories and diary items in on time to see your club on these pages!

REGION 7: SOUTH WALES

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

Aberystwyth & DARS
Ray, GW7AGG, 01970 611 853
10 Visit to Trefenter Windfarm, 8pm
31 Club net, 145.500 then 145.550MHz
Carmarthen ARS
Lloyd, 2W0LLT, 01239 711 297
1 Digital modes, 2W0ZZU
5-6 VHF Field Day
15 Summits on the Air, Allan, GW4VPX
Cleddau ARS
Howard, MW0HVB, 01348 874 236
7 Radio communications MOD style, Ian, MW6IRR
8 Open net, 145.000MHz, 7.30pm
14 Club night and on the air
21 Worked All Britain part 1, Ian Baker
28 BBQ and mobile operation from Brunel Quay
Llanelli ARS
Craig, MW0MXT, 01269 845 773
7 On the air
14 Club raffle
21 Social evening
28 Junk sale & club raffle

South Glamorgan RAYNET have recently taken delivery of an Icom IC-7100 multi mode radio that was supplied by Radioworld. Included in the purchase was the Alinco DM-330 power supply. The provision of this equipment was made possible following the receipt of a grant from Cardiff Emergency Management Unit for which the group are extremely grateful.
Fred, M0BZI heard of South Glamorgan RAYNET's project to set up an emergency HF station and kindly donated one of his popular Western HF 10 antennas, which was added to the discounted MFJ-993B Auto tuner from Waters and Stanton, which completed the setup. Details of the antenna can be found at M0BZI on QRZ.com
South Glamorgan RAYNET has been working in conjunction with the Emergency Management Unit for many years building on their local infrastructure that now includes GB7CD and GB7RB digital repeaters. The group are currently awaiting the arrival of NoVs before commissioning their recently installed 23cm Digital Data units to their network. A number of ID1 digital radios exist in the group and the control room has had a tri-band collinear antenna installed for 2m and 70cm but also includes 23cm for future use. This 7100 has been permanently installed in the Cardiff Councils Control and Co-ordination centre ready for use in an emergency.
The introduction of this dedicated equipment has assisted the team to successfully introduce several new Foundation licence holders to the hobby and many of these new licensees have been recruited and retained within RAYNET also helping the team to grow.
The photo shows Gavin Macho (Principal

Exciting New C4FM/FM Digital Mobile Transceiver

C4FM 144/430 MHz DUAL BAND 50 W DIGITAL/FM TRANSCEIVER

FTM-400DE

Advanced visibility and operability with full color touch panel Operation

Band Scope Screen

Altitude Screen

3.5-inch full color touch panel operation

The icon symbols, multi-function key display and pop-up messages are all displayed in high-resolution color thanks to the full-color, high luminance TFT liquid crystal screen.

Smart Navigation Screen

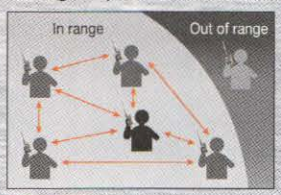
Frequency Direct Input Screen

Smart Navigation Screen

- Real-time navigation function enables Location checking at any time.
- Backtrack function that starts navigation facing a registered point.

Digital Group Monitor (GM) Function

- Automatically checks whether members registered to a group are within the communication range.

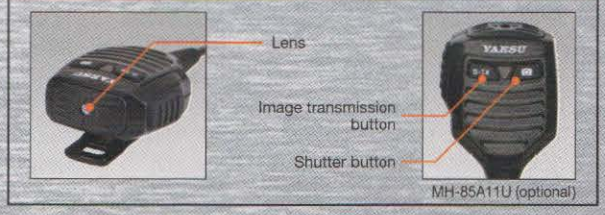


Group Monitor Function

C4FM Digital Clear Voice
Clear and Crisp Voice Technology

Snapshot Function (Image Data Transmission)

- Image data can be displayed on the screen.
- Image data can be sent easily to other C4FM FDMA digital transceivers.



MH-85A11U (optional)

YAESU
The radio

YAESU UK Ltd
Unit 12 Sun Valley Business Park, Winnall Close
Winchester, Hampshire SO23 0LB

Emergency Planning Officer of Cardiff County Council) handing over the New IC-7100 to Roy Magwood, GW1XZI, Controller of South Glamorgan RAYNET (right).

REGION 8: NORTHERN IRELAND

REGIONAL MANAGER: PHILIP HOSEY, MI0MSO, RM8@RSGB.ORG.UK

Grey Point Fort ARS
Stephen, GI4RNP, 02891 852 731
5-6 WW1 Centenary 1914 – 1918

Bangor and District ARS members were in attendance at Ballycopeland Windmill, Millisle for Mills on the Air on Saturday 10 May. They logged 109 contacts on HF and 51 on VHF/UHF. The photograph shows Sam, GI4MBM, David, MI6DTE and Bertie, GI4POC at the windmill after a session slaving over the microphone. For more information see the website www.bdars.com

Everyone is invited to Grey Point Fort within Crawfordsburn Country Park on 5 and 6 July from 10am to 5pm to mark the centenary of WW1. Guided tours, exhibitions, military vehicles and equipment will all help bring the 20th century fort to life over the weekend. **Grey Point Fort ARS** has created a WW2 radio museum consisting of over 200 radios and accessories used during WW2 and other conflicts, they have also created a WW1 and WW2 military memorabilia museum located in the magazine of the fort.
One of the highlights of the weekend is that club members have completely restored one of the two Vickers Sons & Maxim 6 inch Breech Loading guns, dated 1897, which will be fired on Saturday and Sunday.
A wide range of military themed activities are taking place throughout the weekend and it promises to be an entertaining day out for all the family, and a wonderful opportunity to experience what life was like for the members of the military based here.

Causeway Coast & Glens ARC will be holding an on the air event from 1 to 7 July to help raise funds for a memorial or statue to commemorate Rifleman Robert Quigg who was awarded the Victoria Cross on 1 July 1916. It is hoped that enough funds can be raised to have the memorial/statue erected in Bushmills in time for the upcoming 100th anniversary on 1 July 2016. More info is at http://causewaycoastandglen.wix.com/home#!project/cngp. Using 10m, 12m, 15m, 17m, 20m and 40m phone and digi modes PSK31, JT65 etc there will also be a special activation day at Dunderave Playing Fields, Bushmills on 5 July. There will be a car boot sale at £5 per car so why not bring that old unwanted radio gear or clear out the garage and turn it into cash? Other activities from 10.30am include a barbecue. Everyone is welcome including fellow operators to help take the microphone.

REGION 9: LONDON & THAMES VALLEY

REGIONAL MANAGER: LARRY SMITH, G4OXY, RM9@RSGB.ORG.UK

Bracknell ARC
Andy, M0HAK, andy@m0hak.co.uk
2, 16, 23, 30 Club net, 145.375MHz, 8pm
9 Club barbecue
Burnham Beeches RC
Dave, G4XDU, 01628 625 720
7 Getting ready for the McMichael Rally
13 McMichael Rally
21 Talk on getting started in ATV, Noel, G8GTZ
Echelford ARS
John, G4GSC, 01784 451 898
10 Talk on the Easter Island DXpedition, John, G4IRN
24 On-air evening/CW practice/bring & buy/natter night
Edgware & DRS
Mike, G4RNW, 02089 500 658
10 Amateur radio dealers, Steve, G0PQB
24 Changing course in pursuit of this hobby, Steve, G0PQB
Harwell ARS
Malcolm, G8NRP, 01235 524 844
8 Summer DF hunt
Newbury & DARS
Rob, G4LMW, 01635 862 737
12 Club BBQ
Radio Society of Harrow
Linda, G7RJL, 0208 386 8586
1, 8, 15, 22, 29 social
3 R&D of Mini-Beam Antenna, Mike, G0JMI
17 Practical techniques and practices for 4m and 23cm operation, Colin, G3WKZ
27 GX3EFX/P, Old Redding, HA3 6SE
Reading & DARC
Pete, G8FRC, 01189 695 697
10 Audio, Hi-Fi and home cinema, Alan, G6IVB
13 McMichael Rally and Car Boot Sale
Southgate ARC
Mr K Mendum, G8RPA, g8rpa@arrl.net
9 Spinney On The Air
Whitton Amateur Radio Group
www.warg.info
4 FUNcube Satellite, David, G0MRF

The picture below shows Gerry, G0RTN and Kazu, M0CFW/ JK3GAD making use of **Verulam ARC**'s field cabin for a pre-World Radiosport Team Championship (WRTC) equipment 'work out' prior to taking part in the WRTC 2014 championship in New England, USA. This is a contest between 2 person teams and, unlike most other competitions, all stations are required to use identical antennas from the same geographical region, eliminating all variables except operating skills. Further details are at www.wrtc2014.org The cabin has an array of antennas and equipment. Members and guests can also use their own rigs and be on the air very quickly. It's a truly 'plug and play' facility.

REGION 10: SOUTH & SOUTH EAST

REGIONAL MANAGER: MICHAEL SENIOR, G4EFO, RM10@RSGB.ORG.UK

Andover RAC
g4yvm, g4yvm@hotmail.co.uk
1 George Dobbs, G3RJV talk, 7:30, all welcome
15 Natter and on the air
Brede Steam ARS
Steve, 01424 720 815
1, 5, 8, 15, 22, 29 At the shack
Bromley & DARS
Andy, G4WGZ, 01689 878 089
15 Intermediate mentoring – technical topics aimed

Coulsdon ATS
Steve, G3WZK, 01883 620 730
14 The Tx Factor
Cray Valley RS
Richard, G7GLW, 07831 715 797
3 Kite antennas, Roger, G4ROJ
17 MJ8C, by Nobby, G0VJG and/or Chris, G0FDZ
19 Club BBQ
Crystal Palace R&EC
Bob, G3OOU, 01737 552 170
4 Short talks
Dorking & DRS
Garth, G3NPC, 01737 359 472
22 South Downs evening
Farnborough & DRS
Neville, G4SPD, 01252 404 816
5-6 VHF NFD on 5/6 July 2014 at the club contest site
9 Alternative suppliers hand held transceiver Hautian, M6LHS
23 Natter night
Hilderstone R&EC
Chrissie Turner, hilderstoneclub@gmail.com
3 Intermediate exam
Horndean & DARC
Stuart, G0FYX, 02392 472 846
3 Natter night and social activities evening
12-13 GB0SWF, South Downs Wood Fair and Country Park Show, Nr Petersfield
17 Historic wireless/radio/electronics books, Ian Hickman
Itchen Valley ARC
Quintin, M1ENU, 023 8078 7799
11 Broadband aerials talk, Vic, G3NVB
25 Electrical safety & PAT testing talk, Graeme and Paul
Surrey Radio Contact Club
John, G3MCX, 020 8688 3322
7 Club BBQ at G4CCY/ G4DDY QTH
21 Fix it and natter night
Trowbridge & DARC
Ian, G0GRI, 01225 864 698, E/W
2 Talk by Peter Chadwick, G3RZP
5-6 VHF NFD (set up PM of 4th)
16 Natter night & committee meeting
Wimbledon & DARS
Kim, G6JXA, 07812 735 507
11 Summer camp prep evening
25 Summer camp commences, ends 3 August
Worthing & DARC
John, G8FMJ, 01273 593 232
2 Discussion evening
6 Breakfast meeting, 9am, Goring Café
7 80m CC CW Contest
9 Talk by Paul, G3SXE
16 Discussion evening + 80m CC SSB Contest
23 The Grand Canyon... on foot, Phil, G4UDU
26 Worthing Fire Brigade special event station
30 GX3WOR on the air

The photo shows the recent candidates that attended training with the **West Kent ARS** and who passed their exams at the start of May. For this latest course, they had two Foundation and eight Intermediate candidates, all of whom passed their exams.

Hilderstone Radio Club had an excellent weekend celebrating Mills on the Air at the White Mill in Sandwich. They set up a special event radio station, with Matt Payne holding the callsign GB2WM. The White Mill has a fascinating history and one of the radio stations was in the tiny miller's cottage where the miller's wife had given birth to fourteen children! The venue enabled the club to set up the aerials with plenty of space and a good height using the fantail of the windmill. They hope to return there for future events.
At a club training evening, the Intermediate licence candidates were put through their paces thanks to Clive Widdus, Bob Fidler and John Hislop.
Some of the club members journeyed to Waters & Stanton's Open Day to receive the club trophy for the Region 10 Centenary Club of the Year 2013 competition.

Andover Radio Club would like to thank all visitors to their April radio rally. It was cold and wet but fun all the same. Forthcoming events in July include a talk by George Dobbs, G3RJV on the 1st and the club station will be on the air on the 15th. Visitors are welcome.

REGION 11: SOUTH WEST & CHANNEL ISLANDS

REGIONAL MANAGER: PAM HELLIWELL, G7SME, RM11@RSGB.ORG.UK

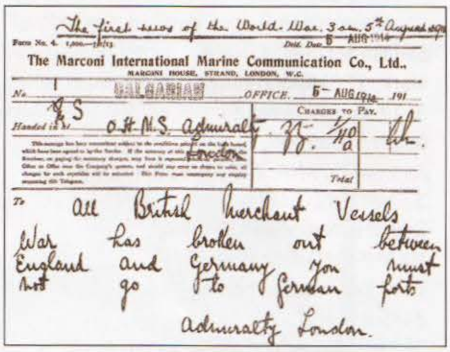
Appledore & DARC
Alan, M6CCW, 01237 422 833
21 Bring and buy evening
Cornish RAC
Steve, G7VOH, 01209 844 939
2 Committee meeting
3 Main club meeting
5 Set up for rally
6 Cornish RAC Rally at Penair School, Truro
17 Natter night
Devon & Cornwall Repeater Group
www.gb3pl.co.uk/
2, 9, 16, 23, 30 From 2pm at the Engine House Compton Park Callington

Exeter ARS
Nick, M0NRJ, 01363 775 756
1, 8, 15, 22, 29 2m net on 145.575MHz
7, 21 HF net on 3.675MHz
14 RAYNET operations and repeater design, John, G8XQQ
28 Solar Max – has it come and gone? Nick, M0NRJ
Exmouth ARC
Mike, G1GZG, 01395 274 172
2 Antenna theory and designs
16 Fox hunt or video night if weather bad
Flight Refuelling ARS
John, G4POF, g4pof@hotmail.com
4-6 VHF NFD at Minterne Hill, Cerne Abbas with the Bracknell Club
20 Hamfest planning meeting
Plymouth Radio Club
David, 2E0DTC, d.beck123@btinternet.com
8 Natter night
Poole Radio Society
Bill, G4ERV, secretary@g4prs.org.uk
4 Activity night / Advanced course
5, 6 National Field Day Contest
11 Repeaters, Chris Shorto, G6WHI
18 Activity night / workshop
20 Day in the park & RSGB Low Power Field Day
25 Activity night
Saltash & DARC
Mark, 2E0MGC, 01752 215 546
3, 17 Operating night
South Bristol ARC
Andrew, G7KNA, 07838 695 471
3 VHF NFD briefing
5, 6 VHF National Field Day
10 VHF NFD debriefing
17 Q3 committee meeting
24 Summer BBQ
31 Open house and on the air night
Thornbury & South Gloucestershire ARC
John Rowden, M0HFH, 07743 697 063
2 Visit to BRCMAC, John, G6RAZ
5, 6 VHF NFD
9 Project night/electronics
16 Small garden antennas, Peter, G4OST
23 On the air
30 Geocaching, John, G6RAZ
Torbay ARSDave, G6FSP, g6fsp@tars.org.uk
25 Torbay Lifeboat Station talk, Colin Bower, Lifeboat Press Officer
Yeovil ARC
Rodney, M0RGE, 01935 825 791
3 BBQ at Ham Hill
10 Mini talks
17 Balloon flight, G7AHP
24 Morse practice, G3MYM
31 On the air

DEADLINES

The next deadlines for entries in *RadCom* Around Your Region are 24 June and 21 July.

Wireless played an important role in WW I and the **Radio Officers' Association** are delighted that Ofcom have agreed that GB100ZZ can operate during August this year. The story behind the callsign is an interesting one. The First World War was declared at midnight on 4 August 1914. The Admiralty alerted the Royal Navy and, at the same time, instructed Poldhu to alert merchant ships. This they did using their callsign ZZ (a specific callsign for merchant and passenger ships). A copy of the message sent from Poldhu and received on board the *SS Calgarian* was found in the Radio Officers Association archives and clearly shows it was received from station ZZ. The Radio Officers' Association represents former sea going, coast station and civil aircraft Radio Officers (formerly wireless operators). They applied to Ofcom for the special call sign GB100ZZ to recognise the sacrifice made by the over 1000 wireless operators who lost their lives from both sides of the conflict. Ofcom have agreed that the Marconi Centre at Poldhu can use GB100ZZ from 3 to 30 August.
While the numbers of wireless operator casualties was very small in comparison to the total losses we have to remember that wireless played an important part in the war both on land, at sea and in the air even though wireless was still in its infancy.


The first news of the World War 3 am 5th August 1914
The Marconi International Marine Communication Co., Ltd.
CALGARIAN OFFICE 5 AUG 1914
ZS O.H.M.S. Admiralty London
To All British Merchant Vessels
War has broken out between England and Germany you must not go to German ports
Admiralty London.

On 27 April, **Yeovil ARC** held its 30th annual QRP Convention at Digby Hall, Sherborne. Speakers were Rob, G3MYM whose subject was 'The First 2-way QRP DX'. He was followed by Rob Mannion, G3XFD, who retired as editor of *Practical Wireless* last year and gave a talk titled 'My club visit adventures, including a parachuted *PW*'. The event also gave visitors an opportunity to buy aerials, equipment, components and kits from the traders present and to have a chat and cup of tea with people they meet once a year. A Bring and Buy stall plus regular traders like Walford Electronics with QRP kits, Sycom with components and the Devon and Exeter DX group with their wide range of goodies to puchase make the event worth visiting for the 150 people present. Next year's date of 12 April is slightly earlier and should avoid the clash with other events that has occurred the last few years. The RSGB, BYLRA, RSARC, RAFARC and G-QRP all had display stands.

Devon & Cornwall Repeater Group with **Callington ARC** held a rally on 6 April at a new venue, Callington Town Hall. The rally was well supported by local radio amateurs, who enjoyed the atmosphere and took home many bargains from small components to a pump up mast. Traders present were Robin Worsley, Steve Webber, RSGB, Pete Longhurst, Amazing Grazing, M0ZOL (Zoli Ritter), John Joll, Kevin Kelly, Luke Kelly, Dave Keplin, RAYNET, GB3PL, GB3GC, GB3NC, RSAR, and Rich Electronics. There was also a large Bring & Buy that sold a lot of equipment. The rally was such a success that the next one has been booked for 29 March 2015. Devon & Cornwall Repeater Group meet every Wednesday afternoon at the Engine House Bistro and Caravan Park, Callington, Cornwall PL17 8EA. Hamish, the owner, allows them to erect antennas and use the facilities for the afternoon. All local amateurs are welcome and holiday visitors who are visiting for a few days stay are also welcome to join the Wednesday afternoon get-togethers. GB3PL and GB3GC 2m and 6m repeaters are available for all to use (145.7625 -600 and 50.73 +500).

REGION 12: EAST & EAST ANGLIA

REGIONAL MANAGER: STEVE THOMAS, M1ACB, RM12@RSGB.ORG.UK

Braintree & DARS
John, M5AJB, 01787 460 947
7 BBQ evening
21 Clansman radios, G0IAG and G0LPO
Cambridge & DARC
David, M0ZEB, 01353 778 093
11 Mag loop aerial demo, Peter, M0DCV
25 Surplus sale
Chelmsford ARS
Martyn, G1EFL, 01245 469 008
1 Launching and tracking of 434MHz balloon, M6EDF at Oaklands Museum
21 Amateur Radio Skills Workshop
Darenth Valley RS
Ray, G0FDU, 01322 220 679
9 On the air
23 Summer barbecue
Felixstowe & DARS
Paul, G4YQC, pjw@btinternet.com
6 Darrell Day, SES GB2FX, Landguard Museum, Felixstowe
21 Natter in the shack
26-27 Military Heritage Weekend SES at Aviation Museum, Foxhall Road, Ipswich
Norfolk ARC
Chris Danby, G0DWV, 01603 898 678
2 Crossing the Atlantic Single Handed, Richard Bennett, M0EAZ
6 Barford rally
7 Informal
16 Closed
20 Radio by the seaside
30 Informal and Bright Sparks
South Essex ARS
Dave, G4UVJ, 01268 697 978
8 Dip into the RSGB Archives talk: Wartime
Thames ARG
Mark Sanderson, M0IEO
4 History of Broadcast Radio, John, 2E0ESX
23-30 Crowsheath Fisheries camping / caravanning / radio
West Kent ARS
Keith, G4JED, info@wkars.org.uk
14 Club meeting

If you're involved in amateur radio training, or you're interested in what's involved on today's Foundation courses, you might be interested in a new series of videos created by Essex Ham. These short videos offer an introduction to the hobby, a look at the Foundation syllabus, the entry-level station build, Morse appreciation and the VHF practical exercises. The videos complement other Foundation training material available for free use on approved training courses, including slides, handouts and getting started guides. Versions of material in other formats is available on request. It can be found at www.essexham.co.uk/train as well as on the RSGB's Training Resources section.

On 1 July, Chris, M6EDF will be giving a presentation to **Chelmsford ARS** on the launching and tracking of 434MHz equipped balloons. The meeting is open to all. Chris took the amateur radio Foundation training course run by CARS in January 2013. He is keen on both electronic construction and software development and combines the two interests in high altitude ballooning. Chris has built many tracker payloads for his balloon launches that usually take place from Danbury Common near Chelmsford.
In May he undertook a STEM (Science, Technology Engineering and Mathematics) event for pupils at the The Sandon School in Chelmsford, launching a balloon equipped with his 434.300MHz tracker enabling the students to track the position of the balloon in real-time.
The trackers typically transmit 50bps FSK RTTY on 434MHz and can have a radio range of over 500km. The data transmitted comprises the GPS location of the balloon and other sensor readings such as pressure, temperature and altitude. The signals are received by a network of listeners who

upload the data to the UK High Altitude Society central server, enabling anyone to see the current location of the balloon on the web.
The meeting takes place at the Oaklands Museum, Moulsham Street, Chelmsford, CM2 9AQ and doors open at 7pm for a 7:30pm start. Parking and admittance are free; a raffle will be held during the evening.

On 10 and 11 May, it was the Fly-in at Stow Maries Aerodrome in Essex. **Dengie Hundred ARS** has a permanent shack at this former World War I airfield and was operating over the weekend under the station's callsign GB0SMA. The centrepiece for the weekend's radio was the use of the historic T1154 / R1155 used on 80m AM. These have been lovingly restored by Peter, G3SUY and were originally in use between 1941 and 1950, playing a significant part in during World War II. These radios were designed in Chelmsford.
A video of the weekend's activities can be found at www.essexham.co.uk/sma2014

South Essex ARG held their first meeting at their new club venue on 13 May. Local amateurs gathered at Swans Green Hall in Thundersley to hear Dave, G4UVJ talk about the radio-related hobby of tracking high altitude balloons. As well as outlining his personal experiences, Dave showed videos taken from balloon cameras as well as a video created by Essex Ham showing how to get started tracking balloons and decoding the RTTY signals.

The fifth Amateur Radio Skills Night, run by **Chelmsford ARS**, was held on 19 May. For the first time at a Skills Night, a live HF CW station was active, operated by Steve, G4ZUL and Rob, M0KCP from the Essex CW Club. A construction and soldering session offered help with making up connectors and patch leads, whilst those interested in working the various amateur radio satellites could explore this part of the hobby with Steve, M0SHQ. Lightning strikes are something that all amateurs fear and Nick, M0NIB brought along his lightning strike detection kit. Regular show-and-tell contributor Peter, G0DZB brought along his Elecraft K3 driven by a Raspberry Pi. Other locals brought along some of their recent projects, the lighthearted quiz caused the usual controversy, and a mix of tea, coffee and home-made cakes made the evening go smoothly. Photos and a video of the evening can be found at www.essexham.co.uk/skills-may14

South Essex ARS operates from Rayleigh windmill in Essex each year Mills on the Air, coordinated by Denby Dale RS. Although this year the weather was a bit challenging, they operated on 2m and HF, making 59 contacts in 13 countries including several other windmills. With the added bonus of Vic's bacon rolls during the day, the event ended as one of their best.

The first meeting in May for **Braintree & DARS** was a natter night. Part of the evening was spent pac testing leads and other equipment ready for use at special event stations. The rest of the evening was spent planning for the first of these, Mills on the Air that was to take place the following weekend. The AGM was held on the19th and. after the usual formalities of minutes, committee member reports etc, it was time for club annual awards. The Founders Trophy, which is sponsored by the four founder members of the club, was awarded to Tony, G0IAG for his publicity and event organising. The Harold King memorial award, which is awarded by the club's magazine editor, went to Tony, G0IAG for his reporting of cub meetings and events in the magazine. A special award was made to Melvin, G0EMK for running the Braintree club net for over 30 years. He has hosted 624 nets in that time and he says he was only asked to take it on as a temporary job. The award, which will be a book of his choice from the RSGB book list will be given formally later, a well-deserved award. The photo shows Tony, G0IAG (right) receiving the Founders Trophy from the club chairman, Howard, G6LXK.

REGION 13: EAST MIDLANDS

REGIONAL MANAGER: STEVE BODEN, G4XCK, RM13@RSGB.ORG.UK

RAF Waddington ARC
Bob, G3VCA, 07971 166 250
7, 14, 21, 28 Club net, 145.325MHz, 20:00
South Kesteven ARS
Nigel, M0CVO, 01476 402 550
2, 16, 30 Net on 145.525MHz, 20:00
9, 23 Informal
Welland Valley ARS
Peter D Rivers, G4XEX, 01858 432 105, g4xex@fsmail.net
2 Club net, 430.0125MHz
5 Special event station
21 DF hunt in Great Bowden Rec

Rob, M0VFC visited **Spalding DARS** again and gave another excellent talk and presentation on his DXpedition to ZD8 and VP9. As usual all present enjoyed his relaxed and enthusiastic approach to this aspect of the hobby– it is somewhat contagious, thanks once again Rob.

Classified Ads

For Sale

WANT A DATA INTERFACE ? You need an ISOTERM, Various models for your needs. PSK, WSJT, WSPR, CW & RTTY. New Cable for Elecraft KX3 available See www.g3liv.co.uk

THINK ITS TIME TO TIDY up your Morse key connections? NEW GOLD PLATED UNIVERSAL CABLETIDYS for most BUG's and PADDLES, VIBROPLEX, JA7GHD,etc 40mm to 60mm spaced connections. See www.g3liv.co.uk email:johnny@melvin.com tel: 0191 2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000
e. barbara@engineered-composites.co.uk
www.engineered-composites.co.uk

BAOFENG, TYT & VERO HANDHELDS at best prices from authorised UK importer. Full range of accessories available. www.sinotel.co.uk, 01926-460203, sales@sinotel.co.uk

CTCSS ENCODER AND DECODER KITS, DTMF Kits and Modules, PIC Microcontroller Development Kits. www.cstech.co.uk

Computer Software

PROGRAMMING SOFTWARE FOR YAESU RADIOS Http://www.g4hfq.co.uk bob.freeth@g4hfq.co.uk (01425) 618092

Cards & Design

QSLERS SPECIAL OFFER 1000 full colour both sides qsl cards £40 plus postage. 07720 580968 www.QSLers.co.uk

LOW COST AND HIGH QUALITY QSL cards by LZ1JZ QSL PRINT http://www.LZ1JZ.com

Aerials

M0CVO ANTENNAS for all your amateur radio antenna needs. Full details at: http://www.m0cvoantennas.com

G4TPH PORTABLE MAGLOOPS Remote and manual tune models for 40m through 10 metres Details at www.g4tph.com

SIGMA EURO-COMM LTD HF Vertical, Wire, G5RV & Mobile Antennas, VHF Base Station Antennas Mounting Poles, Magnetic Mounts Tel 0121 766 8146
stores.ebay.co.uk/sigmaeurocommltd

"WESTERN HF 10" 67ft wire dipole 160-6m, full details lookup m0bzi at: www.qrz.com buy direct: m0bzi@hotmail.co.uk or 07748331458 reviews at: http://g0kya.blogspot.com/2010_08_01_archive.html or http://www.eham.net/reviews/detail/9424

G WHIP ANTENNAS over 45 years of amateur & commercial business. Military specification at amateur prices. Famous resonant end fdes, baluns, windoms, many different antennas, mostly made using kevlar mill spec wire. See Eham reports or www.gwhip.co.uk Tel: 07592 135431

Equipment

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Kent Rigs, 52, Salisbury Road, CHATHAM, Kent, ME4 5NN, 07903 023437

RELIABLE REPAIRS for all amateur and vintage equipment. Professional service, reasonable rates. Call: 01807 580376
E: radiorepairs@btconnect.com

AMTECH-RADIO.COM We buy and sell amateur radio equipment. We provide professional qualified services and repairs to all amateur radio equipment. Contact David on 01323 472216 – 07517 445452

SPECIAL OFFERS – NEW TYT TH-9800 Quadband transceiver covers 29/50/144/432 MHz 50/35W output was £249.95 now £199.95. Anytone AT-5189 70 MHz (4m) 25W FM Transceiver was £149.95 now only £129.95 both at www.nevadaradio.co.uk tel: 02392 313090

Miscellaneous

CALL IN ON THE UK 'GOOD NEWS' CHRISTIAN NETS! Every Sunday morning at 8am local on 3747kHz, 2pm on 3747 or 7147KHz (propagation) and 144.205 SSB at 3pm sharing Christian fellowship. Go to www.wacral.org for more information or contact G3XNX at 51 Alma Road, Brixham, South Devon, TQ5 8QR, Tel: 01803 854504 or derekg3xnx@talktalk.net

PAFOS, CYPRUS. Pafos, 2 bed villa. Simple HF station 300m ASL. www.domsvilla.co.uk

ACCOMMODATION NORTH COAST SCOTLAND. Self catering, B&B, camping. Discounts for licensed amateurs. GM4JYB Tel: 01847 851774. Web: www.letsgonorth.co.uk/dunnet_head Email: briansparks@dunnethead.co.uk

Wanted

UNWANTED VALVE AMPLIFIERS, working or not. Known makes only (Kenwood, Yaesu, Drake, Linear Amp, etc), not homebrew. Also 3-500Z/ZG valves. Cash paid. Contact Peter G3ZRS on 01482 862323 or g3zrs@hotmail.co.uk

VINTAGE RADIO & VALVES WANTED - national cash settlement for silent key, shack clearouts 07552678725, vintageradio@btinternet.com

Classified advertisements 58p per word (VAT inc.) with a minimum of 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
Payment to: RSGB, 3 Abbey Court, Priory Business Park, Bedford, MK44 3WH

Business Cards

For cost effective Business Card advertising call Chris on 01603 898678 to find out more

Adertisers Index

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 94).

FOR SALE

20ft ALUMINIUM LATTICE MAST, brand new, plus hinged base plate, £150. M6JEK, 01621 892 042 (Essex).

70cm HIGH GAIN antenna, 5.1dBi. 2m antenna and 2 boot mount fittings to match, 5m of coax, one 259 fitting and the other MMR 5F fitting, as new £70. M0CVS, 01629 823 025, hamradio12@gmail.com (Wirksworth, Derbyshire).

CARAVAN FOR SALE. Fitted for amateur radio with hob, oven, fridge, awnings, s/wheel and wired for mains. Comes with lots of extras. Could do with a good wash! £300 ONO. Can be viewed in London SE6 area. John, G0CRI, 07956 562 158 (Kent).

CARAVAN MOBILE SHACK, suitable group / individual, containing various types of equipment and facilities. Fitted with antenna sockets, batteries, some cables etc. Contents include toilet, cooker, sinks, solar panels, 12V lighting, mains input for chargers etc, £1250. Graham, M1CQS, controller Norfolk County RAYNET, 01603 880 607.

CAVITY BANDPASS FILTER for 380 – 470MHz Ideal for 70cm. Procom Model BPF70/1-250. Maximum input power 350W. Unloaded Q 8000. Impedance 50 ohm. N female connectors. More information at tinyurl.com/L4qsfyj. Excellent condition. £29 plus carriage (estimated £13). Dave, G3WUN, 01844 291 095, carpediem36@rocketmail.com (Aylesbury).

EDDYSTONE EC10 HF receiver, serial no 5894. Working but needs TLC. 550kHz to 30MHz, £100. Buyer to try, inspect, collect. DigiMaster ProPlus digital data interface, used, good condition, complete with cables, £40 + £5 P&P or collect. Alex, M0TOT, 01444 811 714, panda.henderson@btinternet.com (Haywards Heath).

ELECRAFT K2/100 transceiver complete with mic, power lead and manuals. Veteran of several successful DXpeditions to H4, 8P and 6Y etc, £500. Prefer buyer collects or carriage extra at cost. Phil, G3SWH, 01934 832 736, phil@g3swh.demon.co.uk (Bristol).

FULL 432MHz EME ARRAY. 4x FO19 and all associated cables, splitters and rotors. Small garden setup but works very well. I can supply photos and more information on request. Ready for dismantle and setting up at new location. £350 ONO. Paul, M0EME, 07790 504 413 paul@m0eme.co.uk (Chesterfield).

GOING QRT. Two Icom IC-701 xcvrs, power supplies, SM2 mics (one transceiver lossed o/p). Service history and manuals. Weltz ant match, home made ant tuner, various useful shack contents, ½ drum ant wire, £250 ONO. Buyer collects please. Dave, G3MCA, 01689 856 497 (Orpington).

HUSTLER 4BTV – offers. MFJ-945E 1.8-30MHz antenna tuner, £134 new, offers around £50. 2 mobile antennas, 20m, 40m, offers. 2m mobile antenna, offers. 1 small and 1 large mag mount, offers. Bob Wheatley, M3WRB, 01296 738 029 (Buckingham).

ICOM IC-7000, VGC, original mic, box, power lead, manual and CAT USB control lead, £675. Kenwood TS-480, excellent condition, original mic, power lead, £575. I believe both to have wideband Tx. Collect or carriage at cost. Jim, 2E0JGX, 07930 806 155, 2e0jgx@hotmail.co.uk (Norwich area).

KENWOOD AT-230 ATU with handbook, £80. Yaesu FT-2800M 2m FM transceiver, power leads, MH-48 mic, handbook, £80. Datong FL3 multimode audio filter & instructions, £40. ERA Microreader CW & RTTY decoder, with handbook, £20. G3RKQ, 01406 362 498 (Spalding area).

MAINS TRANSFORMERS. Assorted low and high voltage. Please e-mail for a list. Nick, G3VNC, g3vnc@uk6.net (Cheddar).

PROCOM UHF DUPLEXER DPF70/6 suitable for wide spilt 70cm, 2 off, £10 each. Power converter PV6L 24/12V 10A, good condition tested OK, 2 off, £8 each. Power converter PV6s 24/12V 10A, new condition, tested OK, £8. All plus P&P. Gordon, G3XTH, 01273 843 276, graking@talktalk.net (Sussex).

R1155 with DF ccts, Marconi AD94, Canadian 52 Rx + PSU, exc condition, R209 MK 2. Byers to collect. Offers? G3KJS, 01244 382 727, g3kjs@onetel.com (Chester).

RARE NMK TYPE 8038 Morse key, Kent key, Nye Viking SSK-1 Twin Paddle key, Yaesu PSU 13.8V DC/4.5A, AF and RF signal generators, Linear 10W HF PA kit, REYCO antenna traps. See www.oldmarconiman.co.uk/g3lul.html. Dave, G3LUL, 01622 681 294, g3lul@btinternet.com (Maidstone, Kent).

SILENT KEY SALE. Homebrew linear amp, 1kW output, 2 X 3-500Z Eimac valves. Coverage 80 to 10m including WARC bands. Complete with power supply. Price negotiable around £200. Nearly new Cushcraft R8 vertical antenna, £200. Peter, M3OSP, 01252 323 980 (Farnham, Surrey).

STORAGE DRAWERS AND COMPONENTS, see April MemAds for photo. LAST FEW LEFT. Mike Nicholas, G3TOI, 01202 419 394 mikenicholas888@btinternet.co.uk (Bournemouth).

TEN-TEC ORION 565, excellent condition, with 307B matching speaker and 302R remote desk encoder/keypad. Optional 1. kHz roofing filter and hand microphone. Latest 3.032 firmware and new lithium battery. Original boxes. Non-smoking home. £975 plus carriage. Steve, G3VMW, 01937 845 503, g3vmw@yahoo.co.uk (Leeds).

WOUXUN KG-UVD1P dual band handheld. As new condition, with speaker mic, dry cell case and original box, £60 plus carriage. Ray, G4OWY, 07909 383 475 after 6pm, g4owy6@gmail.com (Dorset).

YAESU FT-1000MP MK 5, 200W, serial no 0N190021, unmarked & good working condition, PSU FP-29, MH-31B8 mic, manual , diagrams, receipts etc, service by Castle Electronics late 2012. Prefer buyer inspect & collect, £850. No offers. Tony, G3KAG 01335 324 393, g3kagroston@yahoo.co.uk (Derbys).

YAESU FT-450, original version, no ATU, nice condition, in original box with manual etc, £350 ONO. Kenwood TR-751E 2m all mode mobile in original box with manual, mobile mount etc, £100 ONO. Tony Beardsley, G3XKT, 0115 917 0082, aebbooks@ntlworld.com (Nottingham).

YAESU FT-757GX HF xcvr, 160-10m inc WARC bands, FP-757HD PSU, Kenwood AT30 ant tuner, mic and manuals, GWO, little used in recent years, £300 ono, buyer collects. Derick, G3HRN, 01952 811 168, derick@blueyonder.co.uk (Shropshire).

YAESU FT-817ND. Very reluctant sale of this excellent rig. VGC and comes boxed with nifty manual. £375 ONO, postage at cost. Alex Hill, G7KSE, g7kse@yahoo.co.uk (West Cumbria).

YAESU FT-8800E FM dual band, with detachable head kit, Watson WM-S hands free mic, Sirio MAG 145 mag mount, SO239, Diamond NR-770R, PL259, handbook, exc condx, little used, boxed, non-smoker, package for £225 + carriage at cost. Bob, G8BCA, 01638 714 051, g8bca@talktalk.net (Suffolk).

YAESU FT-8800E, immaculate condition, boxed with instruction book, not modified, £180 + £10 carriage or collect free. Dave Penny, G6ZSN, 01823 335 421 (Taunton).

YAESU FT-DX5000 plus SM-5000 200W HF/6m xcvr. Still in manufacturer's warranty. As new condition. Boxed, complete with all accessories unused and handbook, £2750 ONO. Collection advised. Steve, G7JCF, 01986 798 524, steve@sboldvic.demon.co.uk (Woodbridge).

STRUMECH 3-SECTION TILT-OVER trailer tower. The trailer hasn't been moved in some time and the tow hitch is not standard. Buyer to collect from the National Radio Centre at Bletchley Park near Milton Keynes. Offers to graham.coomber@rsgb.org.uk

WANTED

BC 348 RECEIVER, preferably as unmodified as possible. Not hashed about. Sensible price paid for good model. J Tuke, GM3BST, 07710 576 590, tuke@btinternet.com (Midlothian).

BOX SECTION TOWER 35ft-40ft, either Altron or Tennamast. Can dismantle and transport. Ron Disney, G0HNZ, 01754 766 587 (Skegness).

DATONG D70 MORSE TUTOR, preferably working condition and no corrosion in battery compartment. George, M3DTD, 01728 602 488, roverm4dtd@btinternet.com (Suffolk).

DEAD OR ALIVE Emotator 1105 rotator and/or controller type MSA or MS for spares, either complete or separately. Sensible price paid and might collect. Tony, G0MDZ, 01636 830 005 (Nottingham/Newark).

DECTape computer magnetic tape (possibly 0.75" wide) on small reel for minicomputer. For static display, need not work. Godfrey, G4GLM, 020 8958 5113, cgmm2@btinternet.com (Edgware).

MORSE KEY Model H-Mound MK701. Recently broke mine and not repairable. No reasonable offer refused. P&P refunded. Peter, G3JSR, 0208 599 8393, pl.chapman@btinternet.com (Essex).

MuTek FRONT END for FT-221/225, working or not. G4OQG, 01249 443 037, g4oqg@hotmail.co.uk (Chippenham).

SCRAP OR SCRUFFY WS NO 19, preferably Mk III, for donor in restoration project. Chris, M0CDD, 01777 766 398 eves, (Spalding).

SIGNAL GENERATOR TO 2.5GHz such as HP8657B. Mike Bush, G3LZM, 01432 271 162 (Hereford).

SILENT KEY CLEAROUT or not just wanted. I collect QSL cards for historic interest; any date but preferably before 1970. Can collect or arrange collection. Tony, G4UZN, 01132 693 892, AQuest1263@ btinternet.com (Leeds).

RALLIES & EVENTS

Members of the RSGB Regional Team will be present with a bookstall at the rallies this month marked with an RSGB diamond

5 JULY – **BANGOR AND DISTRICT ARS RALLY** – Donaghadee Community Centre, County Down BT21 0HB. OT 11.30, £3. TS, B&B, SIG. Peter, MI6NID, 028 9188 9 018, petermi6nid@outlook.com. [www.bdars.com].

6 JULY – **CORNISH RAC 51st MOBILE RALLY** – Penair School, St Clements, Truro, Cornwall, TR1 1TN. TS, B&B, C, TI, CP. OT 10.30, £2. Steve, 01209 844 939, g7voh@btinternet.com. [www.gx4crc.com].

6 JULY – **18th RED ROSE QRP FESTIVAL** – Formby Hall, Alder Street, Atherton, Manchester M46 9EY. Free CP, OT 11.00, £2 (U14 free). TS, SIG, B&B, DF, LB, C. Les Jackson, G4HZJ, 01942 870 634, g4hzj@ntlworld.com.

6 JULY – **BARFORD NORFOLK RADIO RALLY** – Barford Village Hall & Green, Barford, Norwich NR9 4AB, TI S22, CP, OT 9.00 £1.50 (U16s free). C, DF, WIN, TS, B&B. Contact radio@dcpmicro.com. [www.norfolkamateurradio.org].

12 JULY (Saturday) – **STOCKPORT RALLY** – Walthew House, 112 Shaw Heath, Stockport SK2 6QS. OT 10am, £2. TS, DIS, CP, C, TI S22. Tables available £10 each. Bernard, G3SHF, 01625 850 088 (day) or Nigel, G0RXA, 0161 428 8413 (eves).

13 JULY – **McMICHAEL RADIO RALLY & CAR BOOT SALE** – Reading Rugby Football Club, Holme Park Farm Lane, Sonning Lane (B4446), Sonning on Thames, Reading RG4 6ST. TI, free CP, £2, LB, C, SIG, WIN, TS, CBS, OT 9:30. Pete, G8FRC, 01189 695 697. [www.mcmichaelrally.org.uk].

20 JULY – **FINNINGLEY ARS SUMMER RALLY** – The Hurst Radio Communications Centre, Belton Road, Sand toft, Doncaster DN8 5SX. Easily accessible from the M180 Jct 1 / Jct2. OT 10am, TS,CP, B&B,TI, RSGB bookstall. Kevin, G3AAF, 07831614640. [www.finningleyradiorally.co.uk].

25 JULY – **SSC/AMSAT-UK CUBESAT WORKSHOP** – Surrey Space Centre, University of Surrey, Guildford, GU2 7XH. 9am-4pm, free admittance. Amateur satellite beginners' session at 4pm. [http://amsat-uk.org].

25-27 JULY – **AMSAT-UK INTERNATIONAL SPACE COLLOQUIUM** – Holiday Inn, Guildford, GU2 7XZ. A great opportunity to hear about the latest developments and to chat with satellite designers and builders. [http://amsat-uk.org].

27 JULY – **HORNCASTLE SUMMER RALLY** – Horncastle Youth Centre, Lincolnshire LN9 6DZ. OT 10.00/10.30, £1.50, DF, C, free CP. Tables £5, free power. Tony, G3ZPU, 01507 527 835, tony.nightingale@yahoo.co.uk.

This list shows all rallies and events we are aware of as of press deadline. 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. We also recommend you check the details are correct in *RadCom* and **tell us if they're not.**

Abbreviations: 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.

SILENT KEYS

We regret to record the passing of the following Members:

Name	Date
Mrs S Peters, 2E1HAO	29/1/2014
Mr I R Jones, 2W0NNN	5/2014
Mr J A Dunlop, GM3KBZ	2/2/2014
Mr P I Park, GM3PIP	22/5/2014
Mr J W G Pethard, G3PNJ	26/4/2014
Mr I D Reid, G4LMQ	
Mr C Bourne, G4RPG	10/5/2014
Mr D L Williams, GW4TUC	16/5/2014
Mr W R Swan, GM4XYF	18/5/2014
Mr M S R Irvine, MI0MSR	29/5/2014
Mr H Thomson, RS196914	5/2014

OBITUARIES

We welcome obituaries when an amateur sadly passes away. They are published online at www.rsgb.org/sk. Please send submissions by e-mail (only) to sk@rsgb.org.uk. All submissions are moderated and may be edited for reasons of style, grammar, length etc..

SILENT KEY ENTRIES

The Silent Keys column is **separate** from the online obituaries section. To notify the RSGB that a Member has passed away (and their subscription should end and they should be listed here in Silent Keys), please e-mail sales@rsgb.org.uk or telephone 01234 832 700 and then select option 1. We will need to know the deceased's name, callsign or RS number and, if possible, date of death.

3 AUGUST – **25th KING'S LYNN ARC RALLY & CAR BOOT** – Gaywood Community Centre, PE30 4DZ. OT 10am, £2, CP free, TS, CBS pitches, C, CS (by prior arrangement), TI 145.550MHz. Ted, G4OZG, 01553 768701, g4ozg@raynet-uk.net. [www.klarc.org.uk].

3 AUGUST – **LORN RADIO RALLY** – Crianlarich Village Hall. OT 10.30, £2. B&B, WIN. Free tables for traders. Stewart, MM1AVR, 07708 016 522, gm0lra@freeuk.com.

8 AUGUST (Friday) – **COCKENZIE & PORT SETON ARC 21st MINI-RALLY** – Community Centre, Main Hall, Port Seton. bob.gm4uyz@talktalk.net [www.cpsarc.com].

17 AUGUST – **RUGBY AMATEUR TRANSMITTING SOCIETY ANNUAL RADIO RALLY** – Princethorpe College, Princethorpe, Rugby CV23 9PX. Stephen, G8LYB, 01788 578 940, stephen@tompsett.net. [www.rugbyats.co.uk].

10 AUGUST – **FLIGHT REFUELLING ARS HAMFEST** – Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset BH21 3DA. hamfest@frars.org.uk. [www.frars.org.uk].

17 AUGUST – **2nd SOUTH MANCHESTER RADIO CLUB SUMMER RADIO CAR BOOT SALE** – Trafford Metrovicks Rugby and Cricket Club, Finnybank Road, Sale, Cheshire M33 6LR. John, M6JII, 07892 890 902.

24 AUGUST – **MILTON KEYNES ARS RALLY** – Longueville Hall, Hammond Park, Whaddon Road, Newton Longville, Milton Keynes MK17 0AT. Steve, G6KJU, 07866 673 192. [www.mkars.org.uk/mkars/rally].

25 AUGUST (Bank Holiday Monday) – **HUNTINGDONSHIRE ARS RALLY** – St Neots Community College, Barford Rd, St Neots PE19 2SH. Clive Burchell, G3NKQ, 01480 810 473, clive.burchell@btinternet.com.

SPECIAL EVENTS STATIONS

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.

Date	Callsign	Phonetics	Location	Bands	Keeper
01/07/2014	GB0GD	Grand Depart	Otley	LHV27	M0RNS
	GB2WAD	Waddington Air Display	Lincolnshire	LV2	M0OOO
04/07/2014	GB4TDF	Tour de France	Lancashire	LHV27	G1LAT
05/07/2014	GB4AOA	Airfield on Air	Holmfirth	LHV2	G0BFJ
06/07/2014	GB5CQD	Charlie Quebec Delta	North Lincolnshire	LHV27	G0OKF
	GB2FLB	Flint Life Boat	Flint	TLHV27	GW7AAU
12/07/2014	GB1DWH	Dover Western Heights	Kent	TLHV27	G0KOK
	GB0HRC	Houghton Regis Carnival	Bedfordshire	LH7	M0SKM
	GB4WP	War and Peace	Westenhanger	HV27	M1CCF
	GB5TVS	Trunch Village Society	North Walsham	LH2	G3YOA
	GB0SDF	South Down Fair	Hampshire	LH27	M0KTT
	GB0PBR	Pontypool Blaenvon Railway	Blaenavon	LHV	MW0GMH
13/07/2014	GB0IS	Theydon Bois	Essex	2	G0TOC
	GB6MMR	McMichael Mobile Rally	Reading	27	
17/07/2014	GB1TAY	Tay Bridge	Dundee	LHV2	GM0BKC
19/07/2014	GB1AVR	Ackworth Vintage Rally	Ackworth	LHV2	G0BPK
	GB0NTB	Newport Transporter Bridge	Newport	L2	GW4SUE
22/07/2014	GB2BHL	Bidston Hill Lighthouse	Merseyside	LH	M0WAD
25/07/2014	GB1WWO	World War One	Bromsgrove	TLH2	G6NYG
	GB1PF	Palmerston Forts	Portsmouth	LHV27	M0GWD
31/07/2014	GB4FWW	Foxtrot Whisky Whisky	Kent	LH2	G0GDA

31 AUGUST – **TELFORD HAMFEST** – Enginuity Technology Centre, Coalbrookdale, Telford TF8 7DU. Martyn, G3UKV, 01952 255 416. [www.telfordhamfest.co.uk].

6 SEPTEMBER (Saturday) – **FRISKNEY & EAST LINCOLNSHIRE COMMUNICATIONS CLUB RALLY** – The Friskney Village Hall, Church Road, Friskney, Lincs PE22 8RD. Details on 070753 4624 559. [www.felcc.com].

6 & 7 SEPTEMBER – **BRITISH AMATEUR TELEVISION CLUB CONVENTION** – The Everest Academy, Basingstoke, Hampshire. Also BATC BiAGM on Sunday afternoon. [www.batc.org.uk].

14 SEPTEMBER – **HALTON & DISTRICT RADIO AMATEURS RALLY** – Manley Mere. George, G0RLF, 07919 935 725 (daytime), g0rlf@talktalk.net.

14 SEPTEMBER – **TARS 50th ANNUAL COMMUNICATIONS FAIR,** TQ12 3AF. Mike Dixon, 01803 557 941, rally@tars.org.uk.

14 SEPTEMBER – **WEST KENT ARS RADIO AND ELECTRONICS FAIR** – Tunbridge Wells Grammar School for Boys. Dave, G4OTV, rally@wkars.org.uk.

26 & 27 SEPTEMBER – **NATIONAL HAMFEST** – brought to you by the RSGB in association with the Lincoln Short Wave Club. George Stephenson Pavilion, Newark and Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark NG24 2NY (close to junction of A1/A46/A17). [www.nationalhamfest.org.uk].

4 OCTOBER – **5th WEST TYRONE ARC CONFERENCE** - Village Inn, County Tyrone BT79 7LT. Ian, MI1CCU, mi1ccu@mail.com

5 OCTOBER – **BLACKWOOD AND DISTRICT ARS RALLY,** NP20 6QB. Andy, MW0MWZ, 01495 220 687 [www.gw6gw.co.uk].

5 OCTOBER NEW VENUE – **NORTH WAKEFIELD CLUB WINTER RALLY,** LS10 4AX. Tony, 07740 003 159, tonymawson@btinternet.com

10-12 OCTOBER – **RSGB CONVENTION** – Full convention programme of lectures for all interests will be available on the website later in the year. Principal sponsor Martin Lynch & Sons. [www.rsgbevents.org/].

12 OCTOBER – **HACK GREEN BUNKER RALLY,** CW5 8AL. Lucy, 01270 623 353, Lucy@hackgreen.co.uk. [www.hackgreen.co.uk]

12 OCTOBER – **HORNSEA AMATEUR RADIO CLUB RALLY,** HU18 1NQ. Rick, M0CZR, 01964 533 712 [www.hornseaarc.co.uk].

18 OCTOBER – **CARRICKFERGUS AMATEUR RADIO GROUP RALLY,** BT38 7DA. Tim, MI0TBL, carg@hotmail.co.uk. [www.radioclubs.net/carg].

19 OCTOBER – **GALASHIELS AND DISTRICT ARS RADIO RALLY,** TD1 3JX. Jim, GM7LUN, 01896 850 245, gm7lun@qsl.net.

25 OCTOBER – **FOG ON THE TYNE RALLY** – Gateshead NE8 4LH, Nancy Bone, G7UUR, 01914 770 036 (eves) [www.anarc.net].

26 OCTOBER – **24th GREAT NORTHERN HAMFEST** – Barnsley S71 1AN. Ernie, G4LUE, 07984 191 873 [www.gnhf.co.uk].

26 OCTOBER – **NORTH WALES RALLY** – Abergele Leisure Centre, LL22 7HT. Gordon, MW0GBR, mw0gbr@ymail.com. [www.nwrs.org.uk].

9 NOVEMBER – **WEST LONDON RADIO & ELECTRONICS SHOW** (Paul, M0CJX, 08451 650 351 [www.radiofairs.co.uk].

22 NOVEMBER – **ROCHDALE & DISTRICT ARS TRADITIONAL RADIO RALLY,** OL12 6BU. Dave, G0PUD, 0161 285 1600 [www.radars.me.uk].

23 NOVEMBER – **CATS RADIO & ELECTRONICS BAZAAR.** Glenn, G4FVL, bazaar@catsradio.org.

23 NOVEMBER – **PLYMOUTH RADIO CLUB RALLY** – Harewood House, PL7 2AS. Sheila Hart, 2E0YSH, 07815 542 477, sheo@fsmail.net.

6 DECEMBER – **SOUTH LANCS WINTER RALLY** – Bickershaw, WN2 5TE. Jason, 01942 735 828.

7 DECEMBER – **BISHOP AUCKLAND RADIO AMATEURS CLUB RALLY** – Spennymoor Leisure Centre. John, G4LRG, 01388 606 396.

2015

3 MAY – **SCOTTISH HIGHLAND RADIO RALLY** – Aviemore Primary School. Roy, GM4VKI, 01563 850 976, rkavampsev@btinternet.com.

RSGB MEMBERS' ADVERTISEMENTS

RSGB Members wishing to place an advertisement may do so free of charge by e-mail.

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. You should receive an automatic acknowledgement almost immediately. Ads may still be submitted by post but must be accompanied by a payment of £5 to cover administration costs.

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.**

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 anyway. 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.

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926. RSGB is a trading name of Radio Society of Great Britain, a limited company registered in England and Wales with company number 00216431. Member society of the International Amateur Radio Union.

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

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

RSGB MEMBERSHIP

Annual rates from 1 January 2011

Full Membership (by Direct Debit). £47.00
(individual & club)
Family membership (by Direct Debit). £56.00

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

Student (21-25). . . . . Free
Ham Club (under 21). . . . . Free

Subscriptions include VAT where applicable.
Special arrangements exist for visually impaired persons. Details and Membership application forms are available from RSGB HQ or see www.rsgb.org/join

YOUR RSGB

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

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

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

General Manager:
Graham Coomber, G0NBI,
e-mail: graham.coomber@rsgb.org.uk

Honorary Treasurer (Acting):
Richard Horton, G4AOJ, e-mail: g4aoj@rsgb.org.uk

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

THE RSGB BOARD

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

Graham Murchie, G4FSG, (Board Chairman)
e-mail: g4fsg@rsgb.org.uk
Stewart Bryant, G3YSX, e-mail: g3ysx@rsgb.org.uk
Steve Hartley, G0FUW, e-mail: g0fuw@rsgb.org.uk
Stan Lee, G4XXI, e-mail: g4xxi@rsgb.org.uk
Len Paget, GM0ONX, e-mail: gm0onx@rsgb.org.uk
Dr John Rogers, M0JAV, e-mail: m0jav@rsgb.org.uk

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

REGIONAL MANAGERS

Region 1 – J O'Neill, GM7VSB, e-mail: rm1@rsgb.org.uk
Region 2 – B Macintosh, GM4WZG, e-mail: rm2@rsgb.org.uk
Region 3 – K A Wilson, M1CNY, e-mail: rm3@rsgb.org.uk
Region 4 – N Ferguson, G0BPK, e-mail: rm4@rsgb.org.uk
Region 5 – M Vincent, G3UKV, e-mail: rm5@rsgb.org.uk
Region 6 – L Cabban, GW0ETU, e-mail: rm6@rsgb.org.uk
Region 7 – J Sneddon, MW0EQL, e-mail: rm7@rsgb.org.uk
Region 8 – P Hosey, M1OMSO, e-mail: rm8@rsgb.org.uk
Region 9 – L Smith, G4OXY, e-mail:rm9@rsgb.org.uk
Region 10 – M Senior, G4EFO, e-mail: rm10@rsgb.org.uk
Region 11 – P Helliwell, G7SME, e-mail: rm11@rsgb.org.uk
Region 12 – S Thomas, M1ACB, e-mail rm12@rsgb.org.uk
Region 13 – S Boden, G4XCK, e-mail: rm13@rsgb.org.uk

SPECIALIST AREAS – CHAIRMEN & HONORARY OFFICERS

Abuse and Poor Operating
Amateur Radio Observation Service (AROS), Keith Bassett, G7NBU, AROS coordinator, e-mail: aros@rsgb.org.uk, www.rsgb.org/aros/

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

Contests
Ian Pawson, G0FCT, Chairman, Contests Committee, e-mail: cc.chair@rsgb.org.uk, www.rsgb.org/radiosport/

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

General Technical Matters
Andy Talbot, G4JNT, Chairman, Technical Forum, e-mail: tech.chair@rsgb.org.uk, www.rsgb.org/technicalmatters/

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

GB2RS News Service Management
Ken Hatton, G3VBA, GB2RS Manager, e-mail: gb2rs.manager@rsgb.org.uk
(GB2RS news items should be sent to gb2rs@rsgb.org.uk)

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

Intruders to the Amateur Bands
Chris Cummings, G4BOH, e-mail: iw@rsgb.org.uk www.rsgb.org/intruders/

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

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

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

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

Repeater and Data Communications
John McCullagh, GI4BWM, Chairman, ETCC, e-mail: etcc.chairman@rsgb.org.uk, www.ukrepeater.net

RSGB Awards
Contact HQ in the first instance on 01234 832 701, e-mail: AR.dept@rsgb.org.uk, www.rsgb.org/operating/awards/

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

VHF Matters
John Regnault, G4SWX, VHF Manager
E-mail: vhf.manager@rsgb.org.uk

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

HEADQUARTERS STAFF

Tecnical Amateur Radio Enquiries
E-mail: AR.dept@rsgb.org.uk
Telephone: 01234 832 700, Option 4

Amateur Radio Examinations
E-mail: exams@rsgb.org.uk
Telephone: 01234 832 700, Option 3

***RadCom* (news items, feature submissions, etc)**
Elaine Richards, G4LFM or Giles Read, G1MFG
E-mail: radcom@rsgb.org.uk
Telephone: 01234 832 700, Option 8

GB2RS and Club News
E-mail: GB2RS@rsgb.org.uk
Telephone: 01234 832 700, Option 8

Amateur Radio Licensing Enquiries
E-mail: AR.dept@rsgb.org.uk
Telephone: 01234 832 700, Option 5

Sales Department
(Membership, books and other products)
E-mail: sales@rsgb.org.uk
Telephone: 01234 832 700, Option 1

Subscription renewals
Telephone: 01234 832 700, Option 2

IOTA
E-mail: IOTA_HQ@rsgb.org.uk

General Manager
E-mail: GM.dept@rsgb.org.uk
Telephone: 01234 832 700, Option 9

HEADQUARTERS AND REGISTERED OFFICE

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

QSL BUREAU ADDRESS

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

PLAY YOUR PART IN YOUR RSGB

Have Your Say
Let us know how we're doing! Through "Have Your Say" you can let us know your views and you will receive a reply from the General Manager or a Board Member.
Write to haveyoursay@rsgb.org.uk or go to www.rsgb.org/haveyoursay/

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

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

Licensing & Special Event Stations
Licensing and Notices of Variation (NoVs) for special event stations are handled by Ofcom, 0207 981 3131, www.ofcom.org.uk, e-mail Spectrum.Licensing@ofcom.org.uk

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

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

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

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

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

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

WEBSITE

Main website: www.rsgb.org
Members Pages: Log in using your callsign ***in lower case*** as the user name and your Membership number, without the leading zeros (see your *RadCom* address label) as the password.
If you need to update your Membership details, please visit www.rsgb.org/myaccount/

PLASMA PERIL

H Murray, G3NBY

May I take this opportunity to cheer the RSGB and their EMC committee, Ken, G3SDW in particular.

Horror struck in the form of a plasma TV next door (other half of our semi!) newly delivered that day. Noise from long wave upwards was just horrendous. There were slight signs of tailing off around 25MHz but it was still unbearable at 28MHz.

I contacted the Society who put me in contact with Ken, G3SDW, the QRM manager. Ken said that I first needed to establish the make. There are three manufacturers, the one with the 2 letter name being totally uncooperative, full stop. Fortunately, this was a Samsung, not the two letter one.

Highly experienced, Ken had the name/e-mail address to contact within the organisation but warned me that they insist on communication solely with TV owner. Samsung responded pronto by e-mail but, of course, to the set owner whose PC conveniently chose to go bananas just at the wrong moment. Nobody now knew what offer had been made by Samsung and stalemate existed.

Ken got them to repeat the offer by letter. Things stuck for a short spell and then the offer was accepted and a brand new LED version was delivered and installed free of charge.

And that was it! Noise *gone*!

Thank you RSGB. Thank you Samsung and especial thanks to you Ken, who held my hand throughout and knew precisely the steps to take *and* how to take them.

WS19

Tony Preedy, G3LNP

I recall that the WS19 radios from Canada and built, if my memory is still working, by Northern Electric were, in my opinion, superior to those made in the UK because they had aluminium chassis and panels. They were assembled with US threaded fixings rather than BA, coil formers and switches were ceramic rather than paxolin or cardboard. Unfortunately, they had Cyrillic control lettering. Presumably they did not reach the Russian tanks for which they were intended nor did I see them on the UK surplus market. I often wonder what happened to them.

RAYNET NEWS

Doug Fenna, M0DSF

You asked for reports of RAYNET activity during the storms on February. Here is our report from the Isle of Wight.

In view of the expected storms and exceptionally high tides the Isle of Wight Council Emergency Planning Officer (EPO) got in touch with us on Thursday afternoon to say they would like us to be available from 0900 on Friday. They were expecting problems with coastal erosion and flooding as well as the usual falling trees, structural damage, etc. We all kept ourselves ready to respond, some nominated to be in the emergency control centre, others ready to erect a mast for a talkthrough station if needed, others ready to go wherever in their car or on foot.

There was exceptional rainfall on already saturated ground and, on the Friday, a major landslip made a road impassable and fractured utility services so people had to be moved from their homes. The land kept moving throughout Saturday as the evacuation continued. At the same time there was coastal flooding at seven locations and inland flooding at four sites causing transport disruption. Low-lying land that usually drains into the sea at low tide could not be drained because of the high sea level. With a little help from the army, who arrived by Chinook, our professional responders coped without us but we were not stood down until Monday morning when the EPO felt the situation was settling down. We learned later that the Army's role was to advise on the stability of the landslip area, as well as adding manpower to the evacuation.

Being on the Isle of Wight we have to be self-sufficient. We cannot expect to call on support from neighbouring RAYNET groups because the logistics just make it impractical. We have three annual events for which the EPO requests our presence so that if things go wrong we are already in place to assist. One is Cowes Fireworks where there are 8000 people in a confined space and the Event Control Centre, manned by all the emergency services, is in operation throughout the event. The others are the two pop festivals, each of which brings about 40,000 visitors to the Island. In 2012 there was a problem with the main car park and vehicles arriving couldn't get off the roads as fast as they were being unloaded from the ferries, so the roads ground to a standstill. The consequences were serious – mourners couldn't get to funerals, patients couldn't get to hospital appointments, the mobile phone systems were saturated and so on. The authorities weren't aware of the problem until it was too late to prevent it getting worse and the council lost mobile phone contact with their people on the ground. For the exodus the following Monday, and for each similar occasion since, the EPO has called on RAYNET to monitor traffic bottlenecks and report directly to Event Control, where the police direct the necessary action.

All this is facilitated by an excellent relationship with the EPO, who values our contribution, and with other voluntary organisations through the Voluntary Sector Working Group. We formalised the relationship with a Memorandum of Understanding in 2010 and now all the voluntary groups have them.

ONE FUTURE

Des Kostryca, M0AYF

Having read many articles in *RadCom* over the years, I found Peter Cochrane's One future for Amateur Radio? one of the few that made the hairs on my neck stand up. I found the two-part article very interesting and thought provoking and was a little surprised (and saddened) to see it received a largely negative response via The Last Word.

My first introduction to spread-spectrum (SS) communication was back in 1993 when the company I worked for was looking into using direct-sequence spread-spectrum for the now ubiquitous home wireless networks. I recall the excitement this generated within our D&D department at the time. Sadly, the system was later scaled down to a frequency hopping SS system due to cost constraints. Since that introduction I have seen little or no reference to SS communication in amateur radio circles so it was refreshing to see it covered in Peter Cochrane's two part *RadCom* article.

While I don't wish to wade in to the debate about the practicalities of using spread-spectrum systems at microwave frequencies I should just like to ask for some clarification regarding possible choice of amateur frequencies for experimentation. In the second part, Peter Cochrane quoted Paul Jarvis of Ofcom as saying "Radio amateurs could develop/test spread-spectrum techniques within existing amateur bands without specific Ofcom approval, although I would suggest it would be worth letting us know that the experiments are being conducted just in case we get a deluge of complaints!"

So, unless I misunderstand, this could be taken to include some or all of the HF and lower VHF bands. Perhaps it would stimulate more interest in this mode if further clarification could be given as to the choice of frequencies that might be used for SS experiments. For example, 10m spends much of the solar cycle as a 'quiet' band yet offers a large slice of potential bandwidth within which one could perform short range spread-spectrum experiments. I chose the 10m band only as an example and it may be that this band would in fact be a bad choice but clearly some guidelines from both the RSGB and Ofcom would serve to both clarify the position regarding possible experiments and also to encourage more amateur research into this exciting area. Aside from the possible advantages it offers to the amateur radio community it also holds potential for further commercial development. Far from being the impractical approach to radio communication as some have suggested I predict this will indeed be viable and common mode in the not too distant future.

At 57 years old I consider myself well past researching new frontiers, however I do share Peter Cochrane's view that "challenge,

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dreaming and building that which most would consider impossible" might just be enough to re-awaken my youthful enthusiasm for all things radio.

I hope spread-spectrum does not have to wait another few decades before radio amateurs begin to take an interest and experiment further.

Peter Cochrane's comments have certainly created some discussion, which is what I think he intended! Our licence does not specify transmission modes, but requires that messages and station identification are intelligible to other users, and that transmissions do not cause interference to other services. These requirements may limit experimentation on some bands, which is why the Society is supportive of innovative digital experimentation in the 146 – 147MHz range within Ofcom's VHF Spectrum Release Consultation.
John Gould, G3WKL,
Chairman Spectrum Forum

D-STAR ON HF

Vin Robinson, G4JTR

The D-Star Digital mode was introduced by Icom 10 years using GMSK, FDMA technology current at the time, on bands above 144MHz and now there is a growing network of internet connected repeaters and gateways giving world-wide communication with hand held and mobile radios. Normal peer to peer contacts can also be made. This is similar to the Echolink voice over IP (VoIP) system developed in 2002 using analogue FM radio or computer access to a world-wide network of repeaters and gateways. D-Star has the advantage that digital data can be transmitted simultaneously, all within a standard 12.5kHz channel.

Recently D-Star Digital Voice (DV) has been enabled by Icom on HF/VHF/UHF multi-mode radios, specifically on HF on the IC-7100. The latter is proving very popular and many users are now 'playing' with D-Star on the HF bands. The modulation bandwidth of a D-Star transmission is 6kHz. Reception is very high quality down to a threshold signal strength then it rapidly disappears. Ionospheric QSB causes intermittent loss of received audio at threshold conditions.

Now, the key question: is 6kHz wide D-Star DV appropriate to the HF amateur bands? Does it contravene the IARU recommendations for voice communication band widths on HF? For non D-Star users, it is just a 6kHz buzz of noise. There are now several preferred frequencies but it can be heard in many places elsewhere and user nets exist. Many other users don't recognise what they are hearing; it's just another 6kHz wide 'noise' on the HF bands we have to put up with. It seems to me that this has just happened without thinking about the consequences. Is this just a commercial push for a system which may not be appropriate on HF? Do the IARU and national Radio Societies have a view on this?

Of course, experimentation and innovation are fundamental to the hobby so we must welcome new technologies and protocols to be 'air tested' and I see HF D-Star currently at that stage. There are also the AM (6kHz band width) enthusiasts. Most HF transceivers have AM enabled but we don't see the HF bands swamped with AM. The small number of users co-exist easily with SSB and, anyway, AM is resolvable on all HF radios and is inter-operable. D-Star is not.

DV comms on HF are used professionally, usually at high power. Should we be developing a resilient <3kHz bandwidth standard for HF DV, enabled in the radio hardware or in SDR software? The soundcard computer program FreeDV is available but the results are poor in many respects. Should we move into DV on HF at all? My guess is it will take a very clever system to beat the effectiveness of weak signal SSB via the ionosphere. In the meantime we have 6kHz wide D-Star usage increasing on HF whether we like it or not.

A lot of amateur development work is going on in the area of narrow bandwidth digital voice, particularly for HF use. Codec2, *developed by David Rowe, VK5DGR and as used by* FreeDV, *is a patent-free, open-source example that works in a 1.3kHz bandwidth and is said to need about half the bandwidth of the AMBE codec (used on D-Star) for the same voice quality.* Codec2 *received the 2012 ARRL Technical Innovation Award.* FreeDV *is at http://freedv.org/tiki-index.php, along with many useful links. There are other amateur digital voice modes that use even less RF bandwidth - 1.1kHz is quite achievable.*
Giles Read, G1MFG,
RadCom *Technical Editor*

THANKS

John MacNiven, MM3STM

Can I publicly say thanks to Sam, GM4BGB and John, 2MOSIL for their help in enabling me to gain my Intermediate licence in March at the West of Scotland Amateur Radio Club? Sam has tutored me throughout the last 3 months and gave up a lot of his valuable time to help me in achieving my 2MO call. It's people like Sam and John who are a credit to amateur radio in helping others

PITCAIRN ISLAND

Mike, G3TMB

Like John, ZL1AH/G3AH writing in the April edition of *RadCom*, commenting on the letter from GM3WED and his experiences of Pitcairn Island, my memory banks started to stir!

I joined *SS Mataroa* on 2/7/1952 straight out of Radio College (with the ink still wet on my PMG!) as 2nd R/O and sailed from Southampton for New Zealand (no doubt John will have memories of the many dockings in Auckland of this emigrant ship £10 fare by the way!).

Outward bound we called at Pitcairn (as this ship always did) to drop supplies and mail and, as mentioned, the islanders came out in a large whaler rowed by some very big chaps! We exchanged all sorts of stuff and my main memory is of things like soap and soap powder like OMO, Persil and suchlike being much valued and my cabin was filled with bananas and fruit! Tom Christian, the radio op, came out to see us operators and we gave him some things like solder and insulation tape that he was running short of. Tom was on the air just once a day on 435k/cs from 12 to 2pm and, at that time, didn't have HF.

On the voyage home we stopped to off load a large boiler and piping ordered from NZ but, when I called him, got no reply on his usual sked. Then a chap from the island handed us a note saying Tom's receiver had failed and brief details of what the fault might be. As it happened, he had the same Rx, a Marconi CR300, and he was reporting no AF output. The 1st R/O and I thought it must be the A/F amplifier, a 6V6G. We carried several sets of these valves so guess who was elected to go ashore and take him a full set of valves and see if I could assist? What a trip ashore. The whaler almost stood on its end as there was quite a sea running but those rowers knew what they were doing and we got ashore ok. There was no jetty in those days so it was all hands and drag the boat ashore, luckily I only had a pair of shorts on and canvas shoes as we were all soaked.

Well, to cut a long story short, as soon as we switched the receiver on there was not a sound from the phones, so out came the AF amp and in went a 6V6G and we had sound.

I was licensed in 1964 and it took me until 20/12/1991 to work Brian Young, VR6BX (I think he was an American, KB9FLM) with a TS-530 100W to a HF6V GP, he gave me 5 and 6 on 10m and so completed a memorable trip. I did 2 voyages on the *Mataroa* so 2 more visits to Pitcairn but no more trips ashore.

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- *Software: PowerSDR mRX*
- *Ethernet connection*
- *13,8v DC - 165 x 63 x 140 (mm)*

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- *Dual transverter sockets - PTT out - Accessory multi socket*
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- *13.8v DC - Size 265 x 220 x 80 (mm) Weight 4.5kg*

Full spec: www.apache-labs.co.uk

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Both transverters (only one can be fitted at a time) will deliver 3W output and are mounted immediately above the area occupied by the optional auto ATU, as shown in the illustration. If no ATU is fitted then the version with daughter mounting board is required.

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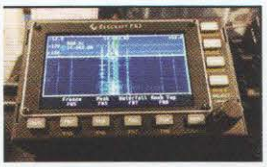
More Accessories for Your KX-3

Key Log To Go

This new unit designed by QRP Works, perfectly matches the KX3 and offers multi line text decoding, 10 memory CW banks, auto logging and advanced keying. It is ideal for SOTA as it enables logging and QSO time.date stamping. Available August. **ETBA.**

PX3 Panoramic adaptor.



Kit £449.95 c
Built £559 c

The new PX3 Panoramic adaptor does the same for the KX3 as the P3 does for the K3. Now you can monitor up to 200kHz of band space or narrow down to just a few KHz, It also features several configerations including the popular waterfall display, This unit will be available during August.

KX-3 Accessories From Stock

MH3	Hand Microphone	£64.95 B
KXFL3	Dual Passband Filter	£129.95 C
KXAT3	Automatic Antenna Tuner	£169.95 C
KXPD3	Iambic Keyer Paddle for KX3	£129.95 C
KXBC3	Internal Charger for board	£64.95 B

Ideal for SOTA

The KX3 is the world's most popular QRP HF transceiver. For one man expeditions it is perfect. Fit internal AA cells and the optional ATU, and you can use end fed wire or coax systems. You will get several hours of operation. Pre-programmed messages and voice recorder add to the operating convenience. You can even get a built-in paddle. So why not launch your own One-Man DXpedition?

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K3 Accessories from Stock

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KPA3-K	Internal 100W used to upgrade from the low power 10W model	£449.95 D
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KTCX03-1	High Stability Ref Xtal	£109.95 C
KDVR3	Digital Voice Recorder - recommend we fit, as it needs front panel removal	£144.95 C
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K3-10W
Kit £1495 Built £1595 d
K3-100W
Kit £1995 Built £2095 d

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The KPA-500 covers the bands 160m to 6m and delivers 600W with a drive level of around 30W. It can be used with any transceiver and features auto band switching through RF sensing. It has a built in AC supply and is the same size as the K3 transceiver. This is a great solid state design with full protection. No warm up and capable of full QSK switching.

KPA-500F Built £2199 d **KPA-500K Kit £1999 d**

P3 Panoramic Display

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Built £759 D Kit £709 D
Carriage Charges: A-£4, B-£5, C-£8.50, D-£11

KAT-500 Auto 500W

Incredible matching capability. This auto ATU will match just about anything up to 10:1 VSWR on an unbalanced line. (Use external 4:1 balun for balanced line.) It has three antenna outputs and integrates easily with the KPA-500 and K3. It can also be used with other linear amplifiers and handles up to 3:1 at 1kW.

Built and tested £729 c Kit £679 c

The T1A Auto ATU 160 - 10m £159.95 c

Ideal for the FT-817
Matches a Wide Range Of Antennas

Great for the FT-817!

Handles power up to 20W. The T1A will handle just about any antenna that is coax or end fed wire. For balanced line, just add a balun. The beauty of this unit is that it is self powered via an internal PP3 battery. The unit only draws current when it is tuning the antenna.